Guinea pig

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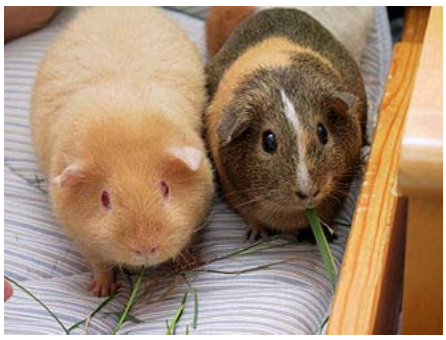
The **guinea pig** (*Cavia porcellus*), also called the **cavy**, is a species of rodent belonging to the family Caviidae and the genus *Cavia*. Despite their common name, these animals are not in the pig family, nor are they from Guinea. They originated in the Andes, and earlier studies based on biochemistry and hybridization suggested they are domesticated descendants of a closely related species of cavy such as *Cavia aperea*, *C. fulgida*, or *C. tschudii* and, therefore, do not exist naturally in the wild.[1][2] Recent studies applying molecular markers,[3][4] in addition to studying the skull and skeletal morphology of current and mummified animals,[5] revealed that the ancestor is most likely *Cavia tschudii*.

The guinea pig plays an important role in the folk culture of many Indigenous South American groups, especially as a food source, but also in folk medicine and in community religious ceremonies.[6] Since the 1960s, efforts have been made to increase consumption of the animal outside South America.[7]

In Western societies, the guinea pig has enjoyed widespread popularity as a household pet since its introduction by European traders in the 16th century. Their docile nature and responsiveness to handling and feeding, and the relative ease of caring for them, continue to make the guinea pig a popular pet. Organizations devoted to competitive breeding of guinea pigs have been formed worldwide, and many specialized breeds of guinea pig, with varying coat colors and compositions, are cultivated by breeders.

Biological experimentation on guinea pigs has been carried out since the 17th century. The animals were frequently used as model organisms in the 19th and 20th centuries, resulting in the epithet "guinea pig" for a test subject, but have since been largely replaced by other rodents such as mice and rats. They are still used in research, primarily as models for human medical conditions such as juvenile diabetes, tuberculosis, scurvy, and pregnancy complications.

Guinea pig



Conservation status

Domesticated

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Rodentia
Suborder:	Hystricomorpha
Infraorder:	Hystricognathi
Parvorder:	Caviomorpha
Family:	Caviidae
Subfamily:	Caviinae
Genus:	*Cavia*
Species:	***C. porcellus***

Binomial name

Cavia porcellus

(Linnaeus, 1758)

Synonyms

Mus porcellus
Cavia cobaya
Cavia anolaimae
Cavia cutleri
Cavia leucopyga
Cavia longipilis

Contents

History

The common guinea pig was first domesticated as early as 5000 BC for food by tribes in the Andean region of South America (the present-day southern part of Colombia, Ecuador, Peru, and Bolivia),[8] some thousands of years after the domestication of the South American camelids.[9] Statues dating from *circa* 500 BC to 500 AD that depict guinea pigs have been unearthed in archaeological digs in Peru and Ecuador.[10] The Moche people of ancient Peru worshipped animals and often depicted the guinea pig in their art.[11] From about 1200 AD to the Spanish conquest in 1532, selective breeding resulted in many varieties of domestic guinea pigs, which form the basis for some of the modern domestic breeds.[12] They continue to be a food source in the region; many households in the Andean highlands raise the animal, which subsists on the family's vegetable scraps.[13] Folklore traditions involving guinea pigs are numerous; they are exchanged as gifts, used in customary social and religious ceremonies, and frequently referenced in spoken metaphors.[14] They also play a role in traditional healing rituals by folk doctors, or *curanderos*, who use the animals to diagnose diseases such as jaundice, rheumatism, arthritis, and typhus.[15] They are rubbed against the bodies of the sick, and are seen as a supernatural medium.[16] Black guinea pigs are considered especially useful for diagnoses.[17] The animal also may be cut open and its entrails examined to determine whether the cure was effective.[18] These methods are widely accepted in many parts of the Andes, where Western medicine is either unavailable or distrusted.[19]

Spanish, Dutch, and English traders brought guinea pigs to Europe, where they quickly became popular as exotic pets among the upper classes and royalty, including Queen Elizabeth I.[8] The earliest known written account of the guinea pig dates from 1547, in a description of the animal from Santo Domingo; because cavies are not native to Hispaniola, the animal was earlier believed to have been introduced there by Spanish travelers.[1] However, based on more recent excavations on West Indian islands, the animal must have been introduced by ceramic-making horticulturalists from South America to the Caribbean around 500 BC,[20] and it was present in the Ostionoid period, for example, on Puerto Rico,[21] long before the advent of the Spaniards. The guinea pig was first described in the West in 1554 by the Swiss naturalist Conrad Gessner.[22] Its binomial scientific name was first used by Erxleben in 1777; it is an amalgam of Pallas' generic designation (1766) and Linnaeus' specific conferral (1758).[1] The earliest known illustration of a domestic guinea pig is a painting (artist unknown) in the collection of the National Portrait Gallery in London, dated to 1580, which shows a girl in typical Elizabethan dress holding a tortoise-shell guinea pig in her hands; she is flanked by her two brothers, one of whom holds a pet bird.[23] The picture dates from the same period as the

oldest recorded guinea pig remains in England, which are a partial cavy skeleton found at Hill Hall (Essex), an Elizabethan manor house, and dated to around 1575.[23]

Name

The scientific name of the common species is *Cavia porcellus*, with *porcellus* being Latin for "little pig". *Cavia* is New Latin; it is derived from *cabiai*, the animal's name in the language of the Galibi tribes once native to French Guiana.[24] *Cabiai* may be an adaptation of the Portuguese *çavia* (now *savia*), which is itself derived from the Tupi word *saujá*, meaning rat.[25] Guinea pigs are called *quwi* or *jaca* in Quechua and *cuy* or *cuyo* (plural *cuyes, cuyos*) in the Spanish of Ecuador, Peru, and Bolivia.[26] Ironically, breeders tend to use the more formal "cavy" to describe the animal, while in scientific and laboratory contexts, it is far more commonly referred to by the more colloquial "guinea pig".[27]

How the animals came to be called "pigs" is not clear. They are built somewhat like pigs, with large heads relative to their bodies, stout necks, and rounded rumps with no tail of any consequence; some of the sounds they emit are very similar to those made by pigs, and they also spend a large amount of time eating.[27][28] They can survive for long periods in small quarters, like a 'pig pen', and were thus easily transported on ships to Europe.[27]

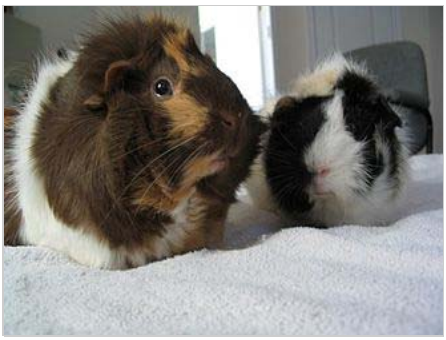
The animal's name alludes to pigs in many European languages. The German word for them is *Meerschweinchen*, literally "little sea pig", which has been translated into Polish as *świnka morska*, into Hungarian as *tengerimalac*, and into Russian as *морская свинка*. This derives from the Middle High German name *merswin*. This originally meant "dolphin" and was used because of the animals' grunting sounds (which were thought to be similar).[29] Many other, possibly less scientifically based explanations of the German name exist. For example, sailing ships stopping to reprovision in the New World would pick up stores of guinea pigs, which provided an easily transportable source of fresh meat. The French term is *cochon d'Inde* (Indian pig) or *cobaye*; the Dutch call it *Guinees biggetje* (Guinean piglet) or cavia (while in some Dutch dialects it is called *Spaanse rat*); and in Portuguese, the guinea pig is variously referred to as *cobaia*, from the Tupi word via its Latinization, or as *porquinho da Índia* (little Indian pig). This is not universal; for example, the common word in Spanish is *conejillo de Indias* (little rabbit of the Indies).[26] The Chinese refer to them as 豚鼠 (*túnshǔ*, 'pig mouse'), and sometimes as Netherlands pig (荷蘭豬, *hélánzhū*) or Indian mouse (天竺鼠, *tiānzhúshǔ*). The Japanese word for guinea pig is "モルモット" (*morumotto*), which derives from the name of another mountain-dwelling rodent, the marmot; this is what guinea pigs were called by the Dutch traders who first brought them to Nagasaki in 1843.

The origin of "guinea" in "guinea pig" is harder to explain. One proposed explanation is that the animals were brought to Europe by way of Guinea, leading people to think they had originated there.[27] "Guinea" was also frequently used in English to refer generally to any far-off, unknown country, so the name may simply be a colorful reference to the animal's exotic appeal.[30][31] Another hypothesis suggests the "guinea" in the name is a corruption of "Guiana", an area in South America, though the animals are not native to that region.[30][32] A common misconception is that they were so named because they were sold for the price of a guinea coin; this hypothesis is untenable, because the guinea was first struck in England in 1663, and William Harvey used the term "Ginny-pig" as early as 1653.[33] Others believe "guinea" may be an alteration of the word coney (rabbit); guinea pigs were referred to as "pig coneys" in Edward Topsell's 1607 treatise on quadrupeds.[27]

Traits and environment

Guinea pigs are large for rodents, weighing between 700 and 1200 g (1.5–2.5 lb), and measuring between 20 and 25 cm (8–10 in) in length.[34] They typically live an average of four to five years, but may live as long as eight years.[35] According to the 2006 *Guinness World Records*, the longest living guinea pig survived 14 years, 10.5 months.[36]

In the 1990s, a minority scientific opinion emerged proposing that caviomorphs, such as guinea pigs, chinchillas, and degus, are not rodents and should be reclassified as a separate order of mammals (similar to lagomorphs).[37][38] Subsequent research using wider sampling has restored consensus among mammalian biologists that the current classification of rodents as monophyletic is justified.[39][40]



Two parti-colored Abyssinian guinea pigs

Natural habitat

C. porcellus is not found naturally in the wild; it is likely descended from some closely related species of cavies, such as *C. aperea*, *C. fulgida*, and *C. tschudii*, which are still commonly found in various regions of South America.[1] Some species of cavy identified in the 20th century, such as *C. anolaimae* and *C. guianae*, may be domestic guinea pigs that have become feral by reintroduction into the wild.[12] Wild cavies are found on grassy plains and occupy an ecological niche similar to that of cattle. They are social, living in the wild in small groups which consist of several females (sows), a male (boar), and the young (which in a break with the preceding porcine nomenclature are called pups). They move together in groups (herds) eating grass or other vegetation, and do not store food.[41] While they do not burrow or build nests, they frequently seek shelter in the burrows of other animals, as well as in crevices and tunnels formed by vegetation.[41] They tend to be most active during dawn and dusk, when it is harder for predators to spot them.[42]

Tri-parti-colored (white, brown and black) guinea pig outside

Domestic habitat

Domesticated guinea pigs thrive in groups of two or more; groups of sows, or groups of one or more sows and a neutered boar are common combinations. Guinea pigs learn to recognize and bond with other individual guinea pigs, and testing of boars shows their neuroendocrine stress response is significantly lowered in the presence of a bonded female when compared to the presence of unfamiliar females.[43] Groups of boars may also get along, provided their cage has enough space, they are introduced at an early age, and no females are present.[44] Domestic guinea pigs have developed a different biological rhythm from their wild counterparts, and have longer periods of activity followed by short periods of sleep in between.[42] Activity is scattered randomly over the day; aside from avoidance of intense light, no regular circadian patterns are apparent.[42]

Domestic guinea pigs generally live in cages, although some owners of large numbers of guinea pigs dedicate entire rooms to their pets. Cages with solid or wire mesh floors are used, although wire mesh floors can cause injury and may be associated with an infection commonly known as bumblefoot (ulcerative pododermatitis).[45] "Cubes and Coroplast" (or C&C) style cages are now a common choice.[46] Cages are often lined with wood shavings or a similar material. Bedding made from red cedar (Eastern or Western) and pine, both softwoods, were commonly used in the past, but these materials are now believed to contain harmful phenols (aromatic hydrocarbons) and oils.[47] Safer beddings made from hardwoods (such as aspen), paper products, and corn cob materials are other alternatives.[47] Guinea pigs tend to be messy within their cages; they often jump into their food bowls or kick bedding and feces into them, and their urine sometimes crystallizes on cage surfaces, making it

This cat has accepted this pair of guinea pigs. The success of this type of interspecies interaction varies according to the individual animals involved.

difficult to remove.[48] After its cage has been cleaned, a guinea pig typically urinates and drags its lower body across the floor of the cage to mark its territory.[49] Male guinea pigs may also mark their territory in this way when they are taken out of their cages.

Guinea pigs do not generally thrive when housed with other species. Housing of guinea pigs with other rodents such as gerbils and hamsters may increase instances of respiratory and other infections,[50] and such rodents may act aggressively toward the guinea pig.[51] Larger animals may regard guinea pigs as prey, though some (such as dogs) can be trained to accept them.[52] Opinion is divided over the cohousing of guinea pigs and domestic rabbits. Some published sources say that guinea pigs and rabbits complement each other well when sharing a cage.[52][53] However, as lagomorphs, rabbits have different nutritional requirements, so the two species cannot be fed the same food.[54] Rabbits may also harbor diseases (such as respiratory infections from *Bordetella* and *Pasteurella*), to which guinea pigs are susceptible.[55] Even the dwarf rabbit is much stronger than the guinea pig and may cause intentional or inadvertent injury.[56]

Behavior

Guinea pigs can learn complex paths to food, and can accurately remember a learned path for months. Their strongest problem-solving strategy is motion.[57] While guinea pigs can jump small obstacles, they are poor climbers, and are not particularly agile. They startle extremely easily, and either freeze in place for long periods or run for cover with rapid, darting motions when they sense danger.[42] Larger groups of startled guinea pigs "stampede", running in haphazard directions as a means of confusing predators.[58] When excited, guinea pigs may repeatedly perform little hops in the air (known as "popcorning"), a movement analogous to the ferret's war dance.[59] They are also exceedingly good swimmers.[60]

Like many rodents, guinea pigs sometimes participate in social grooming, and they regularly self-groom.[61] A milky-white substance is secreted from their eyes and rubbed into the hair during the grooming process.[62] Groups of boars often chew each other's hair, but this is a method of establishing hierarchy within a group, rather than a social gesture.[60] Dominance is also established through biting (especially of the ears), piloerection, aggressive noises, head thrusts, and leaping attacks.[63] Non-sexual simulated mounting for dominance is also common among same-sex groups.


Guinea pigs "social groom"

Guinea pig sight is not as good as that of a human, but they have a wider angle of vision (about 340°) and see in partial color (dichromacy). They have well-developed senses of hearing, smell, and touch.[64][65] Vocalization is the primary means of communication between members of the species.[66] These are the most common sounds made by the guinea pig:[67]

- A "wheek" is a loud noise, the name of which is onomatopoeic, also known as a whistle. An expression of general excitement, it may occur in response to the presence of its owner or to feeding. It is sometimes used to find other guinea pigs if they are running. If a guinea pig is lost, it may wheek for assistance. listen
- A bubbling or purring sound is made when the guinea pig is enjoying itself, such as when being petted or held. It may also make this sound when grooming, crawling around to investigate a new place, or when given food. listen
- A rumbling sound is normally related to dominance within a group, though it can also come as a response being scared or angry. In these cases, the rumble often sounds higher and the body vibrates shortly. While courting, a male usually purrs deeply, swaying and circling the female[68] in a behavior called "rumblestrutting". A low rumble while walking away reluctantly shows passive resistance. listen

- Chutting and whining are sounds made in pursuit situations, by the pursuer and pursuee, respectively. listen
- A chattering sound is made by rapidly gnashing the teeth, and is generally a sign of warning. Guinea pigs tend to raise their heads when making this sound.
- Squealing or shrieking is a high-pitched sound of discontent, in response to pain or danger. listen
- Chirping, a less-common sound, likened to bird song, seems to be related to stress, or when a baby guinea pig wants to be fed. Very rarely, the chirping will last for several minutes. listen

Breeding

Pregnant sow one week before delivering three pups

The guinea pig is able to breed year-round, with birth peaks usually coming in the spring; as many as five litters can be produced per year.[12] The gestation period lasts from 59–72 days, with an average of 63–68 days.[49] Because of the long gestation period and the large size of the pups, pregnant females may become large and eggplant-shaped, although the change in size and shape varies. Unlike the offspring of most other rodents, which are altricial at birth, newborn pups are well-developed with hair, teeth, claws, and partial eyesight;[60] they are immediately mobile, and begin eating solid food immediately, though they continue to suckle. Litters yield one to six pups, with an average of three;[35] the largest recorded litter size is 17.[69]

In smaller litters, difficulties may occur during labour due to over-sized pups. Large litters result in higher incidences of stillbirth, but because the pups are delivered at an advanced stage of development, lack of access to the mother's milk has little effect on the mortality rate of newborns.[70] Cohabitating females assist in mothering duties if lactating.[71]

Guinea pigs also practice alloparental care, in which a female may adopt the pup or pups of another. This might take place if the original parents die or are for some reason separated from them. This behavior is common, and is seen in many other animal species such as the elephant.[72]

Male and female guinea pigs do not differ in external appearance apart from general size. The position of the anus is very close to the genitals in both sexes. Female genitals are distinguished by a Y-shaped configuration formed from a vulvar flap, while the male genitals may look similar, with the penis and anus forming a like shape, the penis will protrude if pressure is applied to the surrounding hair.[73] The male's testes may also be visible externally from scrotal swelling.

Guinea pig pup at eight hours old

Males reach sexual maturity at 3–5 weeks; females can be fertile as early as four weeks and can carry litters before they are adults.[74] Females that have never given birth may develop irreversible fusing of the pubic symphysis, a joint in the pelvis, due to calcification which may occur between six and 10 months of age.[49]:73[75] If they become pregnant after this has happened, the birth canal will not widen sufficiently; this may lead to dystocia and death as they attempt to give birth.[76] Calcification of the female's pubic symphysis (if not bred) is a common myth. The reason for potential calcification is a metabolic disease, like ochronosis. A healthy, normal female guinea pig's pubic symphysis does not calcify.[77] Females can become pregnant 6–48 hours after giving birth, but it is not healthy for a female to be thus constantly pregnant.[78]

Toxemia of pregnancy is common and kills many pregnant females. Signs of toxemia include anorexia, lack of energy, excessive salivation, a sweet or fruity breath odor due to ketones, and seizures in advanced cases.[79] Pregnancy toxemia appears to be most common in hot climates.[80] Other serious complications of pregnancy can include a prolapsed uterus, hypocalcaemia, and mastitis.[81]

Diet

A silver agouti guinea pig eating grass

A short-haired guinea pig eating a piece of apple

Grass is the guinea pig's natural diet. Their molars are particularly suited for grinding plant matter, and grow continuously throughout the animal's life.[82] Most grass-eating mammals are quite large and have a long digestive tract; while guinea pigs have much longer colons than most rodents, they must also supplement their diet by coprophagy, the eating of their own feces.[83] However, they do not consume all their feces indiscriminately, but produce special soft pellets, called cecotropes, which recycle B vitamins, fiber, and bacteria required for proper digestion.[84][85] The cecotropes (or caecal pellets) are eaten directly from the anus, unless the guinea pig is pregnant or obese.[54] They share this behaviour with rabbits. In geriatric boars or sows (the condition is rarer in young ones), the muscles which allow the softer pellets to be expelled from the anus for consumption can become weak. This creates a condition known as anal impaction, which prevents the boar from redigesting cecotropes, though harder pellets may pass through the impacted mass.[86] The condition may be temporarily alleviated by carefully expelling the impacted feces.

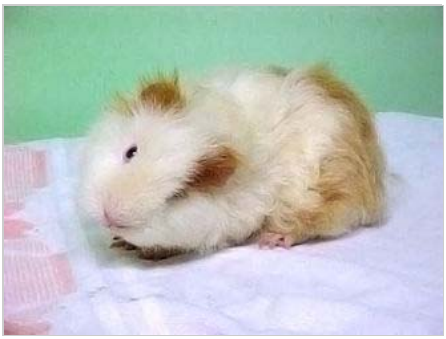
Guinea pigs benefit from feeding on fresh grass hay, such as timothy hay, in addition to food pellets which are often based from timothy. Alfalfa is also a popular food choice; most guinea pigs will eat large amounts of alfalfa when offered it,[87][88] though some controversy exists over the feeding of alfalfa to adult guinea pigs. Some pet owners and veterinary organizations have advised that, as a legume rather than a grass hay, alfalfa consumed in large amounts may lead to obesity, as well as bladder stones due to excess calcium, in any but pregnant and very young guinea pigs.[89][90] However, published scientific sources mention alfalfa as a source for replenishment of protein, amino acids, and fiber.[91][92][93]

Like humans, but unlike most other mammals, guinea pigs cannot synthesize their own vitamin C and must obtain this vital nutrient from food. If guinea pigs do not ingest enough vitamin C, they can suffer from potentially fatal scurvy. Guinea pigs require about 10 mg of vitamin C daily (20 mg if pregnant), which can be obtained through fresh, raw fruits and vegetables (such as broccoli, apple, cabbage, carrot, celery, and spinach) or through dietary supplements.[94] Healthy diets for guinea pigs require a complex balance of calcium, magnesium, phosphorus, potassium, and hydrogen ions; adequate amounts of vitamins E, A, and D are also necessary.[95] Imbalanced diets have been associated with muscular dystrophy, metastatic calcification, difficulties with pregnancy, vitamin deficiencies, and teeth problems.[96][97] Guinea pigs tend to be fickle eaters when it comes to fresh fruits and vegetables, having learned early in life what is and is not appropriate to consume, and their habits are difficult to change after maturity.[92][98] They do not respond well to sudden changes in diet; they may stop eating and starve rather than accept new food types.[60] A constant supply of hay or other food is generally recommended, as guinea pigs feed continuously and may develop habits such as chewing on their own hair if food is not present.[99] Because guinea pigs' teeth grow constantly, they routinely gnaw, lest their teeth become too large for their mouths, a common problem in rodents.[46] Guinea pigs also chew on cloth, paper, plastic, and rubber.

A number of plants are poisonous to guinea pigs, including bracken, bryony, buttercup, charlock, deadly

nightshade, foxglove, hellebore, hemlock, lily of the valley, mayweed, monkshood, privet, ragwort, rhubarb, speedwell, toadflax (both *Linaria vulgaris* and *Linaria dalmatica*), and wild celery.[100] Additionally, any plant which grows from a bulb (e.g., tulip or onion) is normally considered poisonous,[100] as well as ivy and oak tree leaves.

Health


A parti-colored guinea pig suffering from torticollis, or wry neck

Common ailments in domestic guinea pigs include respiratory tract infections, diarrhea, scurvy (vitamin C deficiency, typically characterized by sluggishness), abscesses due to infection (often in the neck, due to hay embedded in the throat, or from external scratches), and infections by lice, mites, or fungus.[101]

Mange mites (*Trixacarus caviae*) are a common cause of hair loss, and other symptoms may also include excessive scratching, unusually aggressive behavior when touched (due to pain), and, in some instances, seizures.[102] Guinea pigs may also suffer from "running lice" (*Gliricola porcelli*), a small, white insect which can be seen moving through the hair; their eggs, which appear as black or white specks attached to the hair, are sometimes referred to as "static lice". Other causes of hair loss can be due to hormonal upsets caused by underlying medical conditions such as ovarian cysts.[103]

Foreign bodies, especially small pieces of hay or straw, can become lodged in the eyes of guinea pigs, resulting in excessive blinking, tearing, and in some cases an opaque film over the eye due to corneal ulcer.[104] Hay or straw dust can also cause sneezing. While it is normal for guinea pigs to sneeze periodically, frequent sneezing may be a symptom of pneumonia, especially in response to atmospheric changes. Pneumonia may also be accompanied by torticollis and can be fatal.[105]

Because the guinea pig has a stout, compact body, it more easily tolerates excessive cold than excessive heat.[106] Its normal body temperature is 101–104°F (38–40°C),[107] so its ideal ambient air temperature range is similar to a human's, about 65–75°F (18–24°C).[106] Consistent ambient temperatures in excess of 90 °F (32 °C) have been linked to hyperthermia and death, especially among pregnant sows.[106] Guinea pigs are not well suited to environments that feature wind or frequent drafts,[108] and respond poorly to extremes of humidity outside of the range of 30–70%.[109]

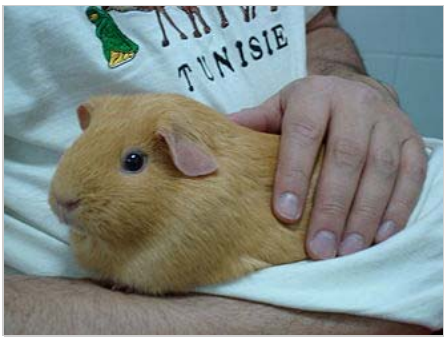
Guinea pigs are prey animals whose survival instinct is to mask pain and signs of illness, and many times health problems may not be apparent until a condition is severe or in its advanced stages. Treatment of disease is made more difficult by the extreme sensitivity guinea pigs have to most antibiotics, including penicillin, which kill off the intestinal flora and quickly bring on episodes of diarrhea and in some cases, death.[110][111]

Similar to the inherited genetic diseases of other breeds of animal (such as hip dysplasia in canines), a number of genetic abnormalities of guinea pigs have been reported. Most commonly, the roan coloration of Abyssinian guinea pigs is associated with congenital eye disorders and problems with the digestive system.[112] Other genetic disorders include "waltzing disease" (deafness coupled with a tendency to run in circles), palsy, and tremor conditions.[113]

Pets

Handling, temperament and socialization

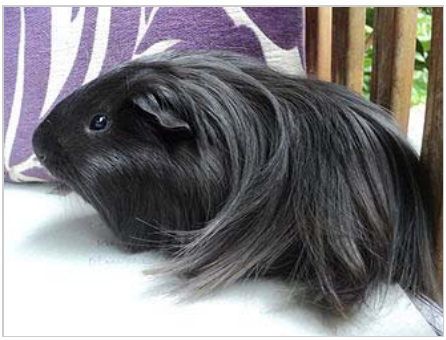
If handled correctly early in life, guinea pigs become amenable to being picked up and carried, and seldom bite or scratch.[60] They are timid explorers and often hesitate to attempt an escape from their cage even when an opportunity presents itself.[53] Still, they show considerable curiosity when allowed to walk freely, especially in familiar and safe terrain. Guinea pigs that become familiar with their owner will whistle on the owner's approach; they will also learn to whistle in response to the rustling of plastic bags or the opening of refrigerator doors, where their food is most commonly stored.



A guinea pig being held

Appearance, coat and grooming

Domesticated guinea pigs occur in many breeds, which have been developed since their introduction to Europe and North America. These varieties vary in hair and color composition. The most common varieties found in pet stores are the English shorthair (also known as the American), which have a short, smooth coat, and the Abyssinian, whose coat is ruffled with cowlicks, or rosettes. Also popular among breeders are the Peruvian and the Sheltie (or Silkie), both straight longhair breeds, and the Texel, a curly longhair. Grooming of guinea pigs is primarily accomplished using combs or brushes. Shorthair breeds are typically brushed weekly, while longhair breeds may require daily grooming.[114]


Black-haired Silkie Guinea pig

Clubs and associations

Cavy clubs and associations dedicated to the showing and breeding of guinea pigs have been established worldwide. The American Cavy Breeders Association, an adjunct to the American Rabbit Breeders' Association, is the governing body in the United States and Canada.[115] The British Cavy Council governs cavy clubs in the United Kingdom. Similar organizations exist in Australia (Australian National Cavy Council)[116] and New Zealand (New Zealand Cavy Club).[117] Each club publishes its own standard of perfection and determines which breeds are eligible for showing.

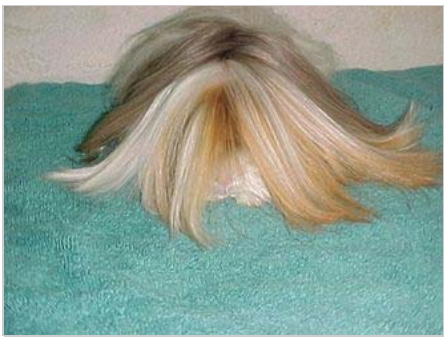
Allergies to pet guinea pigs

Allergic symptoms, including rhinitis, conjunctivitis, and asthma, have been documented in laboratory animal workers who come into contact with guinea pigs.[118][119] Allergic reactions following direct exposure to guinea pigs in domestic settings have also been reported.[118] Two major guinea pig allergens, Cav p I and Cav p II, have been identified in guinea pig fluids (urine and saliva) and guinea pig dander.[118] People who are allergic to guinea pigs are usually allergic to hamsters and gerbils, as well.[120] Allergy shots can successfully treat an allergy to guinea pigs, although treatment can take up to 18 months.

Cultural and media influence

As a result of their widespread popularity, especially in households with children, guinea pigs have shown a presence in culture and media. Some noted appearances of the animal in literature include the short story "Pigs Is Pigs" by Ellis Parker Butler, which is a tale of bureaucratic incompetence. Two guinea pigs held at a railway station breed unchecked while humans argue as to whether they are "pigs" or "pets" for the purpose of determining freight charges.[121] Butler's story, in turn, inspired the *Star Trek: The Original Series* episode "The Trouble With Tribbles", written by David Gerrold.[122] In the Golden Hamster Saga books, two guinea pigs named Enrico and Caruso are modern-day thespians (named after Enrico Caruso) who serve as

secondary characters, and often irritate the main character, Freddy Auratus, that strongly dislikes their acting antics.



A lilac, orange, and white Satin Peruvian guinea pig (show-length coat)

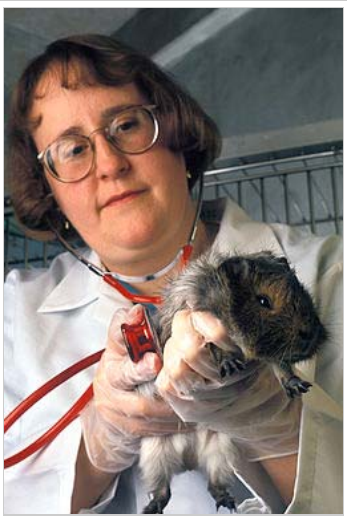
In children's literature

The Fairy Caravan, a novel by Beatrix Potter,[123] and Michael Bond's Olga da Polga series for children,[124] both feature guinea pigs as the central protagonist. Another appearance is in *The Magician's Nephew* by C. S. Lewis: in the first (chronologically) of his *The Chronicles of Narnia* series, a guinea pig is the first creature to travel to the Wood between the Worlds.[125] In Ursula Dubosarsky's *Maisie and the Pinny Gig*, a little girl has a recurrent dream about a giant guinea pig, while guinea pigs feature significantly in several of Dubosarsky's other books, including the young adult novel *The White Guinea Pig* and *The Game of the Goose*.[126]

In film and television

Guinea pigs have also been featured in film and television. In the TV movie *Shredderman Rules*, the main character and the main character's crush both have guinea pigs which play a minor part in the plot. A guinea pig named Rodney, voiced by Chris Rock, was a prominent character in the 1998 film *Dr. Dolittle*, and Linny the Guinea pig is a co-star on Nick Jr.'s *Wonder Pets*. Guinea pigs were used in some major advertising campaigns in the 1990s and 2000s, notably for Egg Banking plc,[127] Snapple, and Blockbuster Video.[128] The Blockbuster campaign is considered by some guinea pig advocates to have been a factor in the rise of caging guinea pigs and rabbits together.[56] In the *South Park* season 12 episode "Pandemic 2: The Startling", giant guinea pigs dressed in costumes rampage over the Earth.[129] The 2009 Walt Disney Pictures movie *G-Force* features a group of highly intelligent guinea pigs trained as operatives of the U.S. government. A video game based on the movie was also released. A guinea pig named Bugsy appears in the 2008 film *Bedtime Stories*. A guinea pig named Cashew features prominently in the second season of the U.S. adaptation of *House of Cards*.

Scientific research



A guinea pig being examined by a veterinary medical officer for general health and pulmonary condition

The use of guinea pigs in scientific experimentation dates back at least to the 17th century, when the Italian biologists Marcello Malpighi and Carlo Fracassati conducted vivisections of guinea pigs in their examinations of anatomic structures.[130] In 1780, Antoine Lavoisier used a guinea pig in his experiments with the calorimeter, a device used to measure heat production. The heat from the guinea pig's respiration melted snow surrounding the calorimeter, showing that respiratory gas exchange is a combustion, similar to a candle burning.[131] Guinea pigs played a major role in the establishment of germ theory in the late 19th century, through the experiments of Louis Pasteur, Émile Roux, and Robert Koch.[132] Guinea pigs have been launched into orbital space flight several times, first by the USSR on the Sputnik 9 biosatellite of March 9, 1961 – with a successful recovery.[133] China also launched and recovered a biosatellite in 1990 which included guinea pigs as passengers.[134]

In English, the term 'guinea pig' is commonly used as a metaphor for a subject of scientific experimentation, or any experiment or test in modern times. This dates back to the early 20th century; the Oxford English Dictionary notes its

first usage in this capacity in 1913.[135] In 1933, Consumers Research founders F. J. Schlink and Arthur Kallet wrote a book entitled *100,000,000 Guinea Pigs*, extending the metaphor to consumer society.[136] The book became a national bestseller in the United States, thus further popularizing the term, and spurred the growth of the consumer protection movement.[137] The negative connotation of the term was later employed in the novel *The Guinea Pigs* by Czech author Ludvík Vaculík as an allegory for Soviet totalitarianism.[138] Guinea pigs were popular laboratory animals until the later 20th century; about 2.5 million guinea pigs were used annually in the U.S. for research in the 1960s,[139] but that total decreased to about 375,000 by the mid-1990s.[60] As of 2007, they constitute about 2% of the current total of laboratory animals.[139] In the past, they were widely used to standardize vaccines and antiviral agents; they were also often employed in studies on the production of antibodies in response to extreme allergic reactions, or anaphylaxis.[140] Less common uses included research in pharmacology and irradiation.[140] Since the middle 20th century, they have been replaced in laboratory contexts primarily by mice and rats. This is in part because research into the genetics of guinea pigs has lagged behind that of other rodents, although geneticists W. E. Castle and Sewall Wright made a number of contributions to this area of study, especially regarding coat color.[113][141] In 2004, the U.S.'s National Human Genome Research Institute announced plans to sequence the genome of the domestic guinea pig.[142]

The guinea pig was most extensively implemented in research and diagnosis of infectious diseases.[140] Common uses included identification of brucellosis, Chagas disease, cholera, diphtheria, foot-and-mouth disease, glanders, Q fever, Rocky Mountain spotted fever, and various strains of typhus.[140] They are still frequently used to diagnose tuberculosis, since they are easily infected by human tuberculosis bacteria.[139] Because guinea pigs are one of the few animals which, like humans and other primates, cannot synthesize vitamin C, but must obtain it from their diet, they are ideal for researching scurvy.[139] From the accidental discovery in 1907 that scurvy could be induced in guinea pigs, to their use to prove the chemical structure of the "ascorbutic factor" in 1932, the guinea pig model proved a crucial part of vitamin C research.[143][144]

Complement, an important component for serology, was first isolated from the blood of the guinea pig.[139] Guinea pigs have an unusual insulin mutation,[145] and are a suitable species for the generation of anti-insulin antibodies.[146] Present at a level 10 times that found in other mammals, the insulin in guinea pigs may be important in growth regulation, a role usually played by growth hormone.[147] Additionally, guinea pigs have been identified as model organisms for the study of juvenile diabetes and, because of the frequency of pregnancy toxemia, of pre-eclampsia in human females.[71]

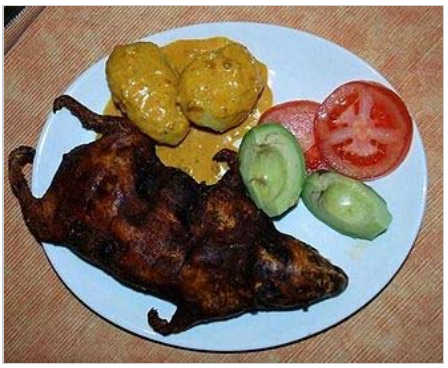
Guinea pig strains used in scientific research are primarily outbred strains. Aside from the common American or English stock, the two main outbred strains in laboratory use are the Hartley and Dunkin-Hartley; these English strains are albino, although pigmented strains are also available.[148] Inbred strains are less common and are usually used for very specific research, such as immune system molecular biology. Of the inbred strains that have been created, the two still used with any frequency are, following Sewall Wright's designations, "Strain 2" and "Strain 13".[113][148]

Guinea pigs are also used extensively in reproductive studies because their placental structure is similar to that of humans and their gestation period can be divided into trimesters that resemble the stages of fetal development in humans. They can also develop pregnancy toxemia.[149]

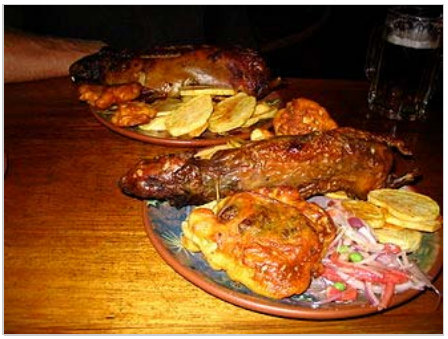
Hairless breeds of guinea pigs have been used in scientific research since the 1980s, particularly for dermatological studies. A hairless and immunodeficient breed was the result of a spontaneous genetic mutation in inbred laboratory strains from the Hartley stock at the Eastman Kodak Company in 1979.[150] An immunocompetent hairless breed was also identified by the Institute Armand Frappier in 1978, and Charles River Laboratories has reproduced this breed for research since 1982.[151] Cavy fanciers then began acquiring hairless breeds, and the pet hairless varieties are referred to as "skinny pigs".

As food

South America



Dish from Ecuador called *cuy*



Two Peruvian dishes of *cuy* meat

Cuy being raised at home in the traditional Andean fashion

Guinea pigs (called *cuy*, *cuye*, or *curí*) were originally domesticated for their meat in the Andes. Traditionally, the animal was reserved for ceremonial meals by indigenous people in the Andean highlands, but since the 1960s, it has become more socially acceptable for consumption by all people.[152] It continues to be a major part of the diet in Peru and Bolivia, particularly in the Andes Mountains highlands; it is also eaten in some areas of Ecuador (mainly in the Sierra) and Colombia.[153] Because guinea pigs require much less room than traditional livestock and reproduce extremely quickly, they are a more profitable source of food and income than many traditional stock animals, such as pigs and cattle;[154] moreover, they can be raised in an urban environment. Both rural and urban families raise guinea pigs for supplementary income, and the animals are commonly bought and sold at local markets and large-scale municipal fairs.[155] Guinea pig meat is high in protein and low in fat and cholesterol, and is described as being similar to rabbit and the dark meat of chicken.[7][156] The animal may be served fried (*chactado* or *frito*), broiled (*asado*), or roasted (*al horno*), and in urban restaurants may also be served in a casserole or a fricassee.[157] Ecuadorians commonly consume *sopa* or *locro de cuy*, a soup dish.[157] *Pachamanca* or *huatia*, a process similar to barbecueing, is also popular, and is usually served with corn beer (*chicha*) in traditional settings.[157]

Peruvians consume an estimated 65 million guinea pigs each year, and the animal is so entrenched in the culture that one famous painting of the Last Supper in the main cathedral in Cusco shows Christ and the 12 disciples dining on guinea pig.[7] The animal remains an important aspect of certain religious events in both rural and urban areas of Peru. A religious celebration known as *jaca tsariy* ("collecting the cuys") is a major festival in many villages in the Antonio Raimondi province of eastern Peru, and is celebrated in smaller ceremonies in Lima.[158] It is a syncretistic event, combining elements of Catholicism and pre-Columbian religious practices, and revolves around the celebration of local patron saints.[158] The exact form the *jaca tsariy* takes differs from town to town; in some localities, a *sirvinti* (servant) is appointed to go from door to door, collecting donations of guinea pigs, while in others, guinea pigs may be brought to a communal area to be released in a mock bullfight.[158] Meals such as *cuy chactado* are always served as part of these festivities, and the killing and serving of the animal is framed by some communities as a symbolic satire of local politicians or important figures.[158] In the Tungurahua and Cotopaxi provinces of central Ecuador, guinea pigs are employed in the celebrations surrounding the feast of Corpus Christi as part of the *Ensayo*, which is a community meal, and the *Octava*, where *castillos* (greased poles) are erected with prizes tied to the crossbars, from which several guinea pigs may be hung.[159] The Peruvian town of Churin has an annual festival which involves dressing guinea pigs in elaborate costumes for a competition.[160]

Andean immigrants in New York City raise and sell guinea pigs for meat, and some ethnic restaurants in major United States cities serve *cuy* as a delicacy.[161] Peruvian research universities, especially La Molina National Agrarian University, began experimental programs in the 1960s with the intention of breeding larger-sized guinea pigs.[162] Subsequent university efforts have sought to change breeding and husbandry procedures in South America, to make the raising of guinea pigs as livestock more economically sustainable.[163] In the 1990s and 2000s, the university began exporting the larger breed guinea pigs to Europe, Japan, and the United States in the hope of increasing human consumption outside of these countries in northern South America.[7]

Sub-Saharan Africa

Many efforts have also been made to promote guinea pig husbandry in developing countries of West Africa,[154] where they occur more widely than generally known because they are usually not covered by livestock statistics. However, it has not been known when and where the animals have been introduced to Africa.[164] In Cameroon, they are widely distributed.[165][166] In the Democratic Republic of the Congo, they can be found both in peri-urban environments[167] as well as in rural regions, for example, in South Kivu.[168][169] They are also frequently held in rural households in Iringa Region of southwestern Tanzania.[170][171]

Western culture

Nevertheless, as a food source, guinea pigs are generally considered taboo in other countries in America and Europe. In reality television, guinea pig meat has been consumed as an exotic dish by such Western celebrity chefs as Andrew Zimmern (for his show *Bizarre Foods*), Anthony Bourdain in *No Reservations*, and Jeff Corwin in his show *Extreme Cuisine*.

See also

- Kurloff cells
- Peter Gurney
- Save the Newchurch Guinea Pigs

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- Media related to Cavia porcellus at Wikimedia Commons
- ACBA – American Cavy Breeders' Association (http://acbaonline.com/)
- Domestic Guinea Pig Genome (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=genomeprj&cmd=Retrieve&dopt=Overview&list_uids=12582)
- View the guinea pig genome (http://www.ensembl.org/Cavia_porcellus/Info/Index/) on Ensembl

Wikibooks has a book on the topic of: ***Animal Care/Guinea pig***

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