[Template:Other uses](/wiki/Template:Other_uses" \o "Template:Other uses) [Template:Pp-semi-indef](/wiki/Template:Pp-semi-indef) [Template:Taxobox](/wiki/Template:Taxobox) The **horse** (*Equus ferus caballus*)<ref name=MSW3>[Template:MSW3 Perissodactyla](/wiki/Template:MSW3_Perissodactyla)</ref>[[1]](#cite_note-1) is one of two [extant](/wiki/Extant_taxon) [subspecies](/wiki/Subspecies) of [*Equus ferus*](/wiki/Wild_horse). It is an [odd-toed ungulate](/wiki/Odd-toed_ungulate) [mammal](/wiki/Mammal) belonging to the taxonomic family [Equidae](/wiki/Equidae). The horse has [evolved](/wiki/Evolution_of_the_horse) over the past 45 to 55 million years from a small multi-toed creature, [*Eohippus*](/wiki/Eohippus), into the large, single-toed animal of today. Humans began to [domesticate](/wiki/Domestication) horses around 4000 BC, and their [domestication](/wiki/Domestication_of_the_horse) is believed to have been widespread by 3000 BC. Horses in the subspecies *caballus* are domesticated, although some domesticated populations live in the wild as [feral horses](/wiki/Feral_horse). These feral populations are not true [wild horses](/wiki/Wild_horse), as this term is used to describe horses that have never been domesticated, such as the endangered [Przewalski's horse](/wiki/Przewalski's_horse), a separate subspecies, and the only remaining true [wild horse](/wiki/Wild_horse). There is an extensive, specialized vocabulary used to describe equine-related concepts, covering everything from [anatomy](/wiki/Anatomy) to life stages, size, [colors](/wiki/Equine_coat_color), [markings](/wiki/Horse_markings), [breeds](/wiki/Horse_breed), [locomotion](/wiki/Animal_locomotion), and behavior.

Horses' anatomy enables them to make use of speed to escape predators and they have a well-developed [sense of balance](/wiki/Equilibrioception) and a strong [fight-or-flight response](/wiki/Fight-or-flight_response). Related to this need to flee from predators in the wild is an unusual trait: horses are able to sleep both standing up and lying down. Female horses, called [mares](/wiki/Mare), carry their young for approximately 11 months, and a young horse, called a [foal](/wiki/Foal), can stand and run shortly following birth. Most domesticated horses begin training under [saddle](/wiki/Saddle) or in [harness](/wiki/Horse_harness) between the ages of two and four. They reach full adult development by age five, and have an average lifespan of between 25 and 30 years.

Horse breeds are loosely divided into three categories based on general temperament: spirited "hot bloods" with speed and endurance; "cold bloods", such as [draft horses](/wiki/Draft_horse) and some [ponies](/wiki/Pony), suitable for slow, heavy work; and "[warmbloods](/wiki/Warmblood)", developed from crosses between hot bloods and cold bloods, often focusing on creating breeds for specific riding purposes, particularly in Europe. There are more than 300 breeds of horse in the world today, developed for many different uses.

Horses and humans interact in a wide variety of sport competitions and non-competitive recreational pursuits, as well as in working activities such as [police work](/wiki/Mounted_police), [agriculture](/wiki/Working_animal), entertainment, and [therapy](/wiki/Hippotherapy). Horses were historically used in warfare, from which a wide variety of [riding](/wiki/Equestrianism) and [driving](/wiki/Driving_(horse)) techniques developed, using many different styles of [equipment](/wiki/Horse_tack) and methods of control. Many products are derived from horses, including meat, milk, hide, hair, bone, and pharmaceuticals extracted from the urine of pregnant mares. Humans provide domesticated horses with food, water and shelter, as well as attention from specialists such as [veterinarians](/wiki/Veterinarian) and [farriers](/wiki/Farrier).

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## Biology[[edit](/index.php?title=(none)&action=edit&section=1)]

[Template:Main](/wiki/Template:Main) [thumb|Points of a horse](/wiki/File:Points_of_a_horse.jpg)[[2]](#cite_note-2)[[3]](#cite_note-3)|upright=1.5|alt=Diagram of a horse with some parts labeled. Specific terms and specialized language are used to describe [equine anatomy](/wiki/Equine_anatomy), different life stages, colors and breeds.

### Lifespan and life stages[[edit](/index.php?title=(none)&action=edit&section=2)]

Depending on breed, [management](/wiki/Horse_management) and environment, the modern domestic horse has a life expectancy of 25 to 30 years.<ref name=Ensminger46/> Uncommonly, a few animals live into their 40s and, occasionally, beyond.[[4]](#cite_note-4) The oldest verifiable record was "[Old Billy](/wiki/Old_Billy)", a 19th-century horse that lived to the age of 62.<ref name=Ensminger46/> In modern times, Sugar Puff, who had been listed in [*Guinness World Records*](/wiki/Guinness_World_Records) as the world's oldest living pony, died in 2007 at age 56.[[5]](#cite_note-5) Regardless of a horse or pony's actual birth date, for most competition purposes a year is added to its age each January 1 of each year in the Northern Hemisphere<ref name=Ensminger46/>[[6]](#cite_note-6) and each August 1 in the Southern Hemisphere.[[7]](#cite_note-7) The exception is in [endurance riding](/wiki/Endurance_riding), where the minimum age to compete is based on the animal's actual calendar age.<ref name=Endurance>[Template:Cite web](/wiki/Template:Cite_web)</ref>

The following terminology is used to describe horses of various ages:

* [Colt](/wiki/Colt_(horse)): A male horse under the age of four.[[8]](#cite_note-8) A common terminology error is to call any young horse a "colt", when the term actually only refers to young male horses.[[9]](#cite_note-9)\* [Filly](/wiki/Filly): A female horse under the age of four.<ref name=Ensminger418/>
* [Foal](/wiki/Foal): A horse of either sex less than one year old. A nursing foal is sometimes called a *suckling* and a foal that has been weaned is called a *weanling*.<ref name=Ensminger418>[Ensminger](/wiki/#Ensminger), p. 418</ref> Most domesticated foals are weaned at five to seven months of age, although foals can be weaned at four months with no adverse physical effects.[[10]](#cite_note-10)\* [Gelding](/wiki/Gelding): A [castrated](/wiki/Castration) male horse of any age.<ref name=Ensminger418/>
* [Mare](/wiki/Mare): A female horse four years old and older.[[11]](#cite_note-11)\* [Stallion](/wiki/Stallion): A non-castrated male horse four years old and older.[[12]](#cite_note-12) The term "horse" is sometimes used colloquially to refer specifically to a stallion.<ref name=Ensminger420>[Ensminger](/wiki/#Ensminger), p. 420</ref>
* [Yearling](/wiki/Yearling_(horse)): A horse of either sex that is between one and two years old.[[13]](#cite_note-13)

In [horse racing](/wiki/Horse_racing), these definitions may differ: For example, in the British Isles, [Thoroughbred](/wiki/Thoroughbred) horse racing defines colts and fillies as less than five years old.[[14]](#cite_note-14) However, Australian Thoroughbred racing defines colts and fillies as less than four years old.[[15]](#cite_note-15)

### Size and measurement[[edit](/index.php?title=(none)&action=edit&section=3)]

The height of horses is usually measured at the highest point of the [withers](/wiki/Withers), where the neck meets the [back](/wiki/Back_(horse)).<ref name=Whitaker77>[Whitaker](/wiki/#Whitaker), p. 77</ref> This point is used because it is a stable point of the anatomy, unlike the head or neck, which move up and down in relation to the body of the horse.

In English-speaking countries, the height of horses is often stated in units of [hands](/wiki/Hand_(length)) and inches: one hand is equal to [Template:Convert](/wiki/Template:Convert). The height is expressed as the number of full hands, followed by a [point](/wiki/Radix_point), then the number of additional inches, and ending with the abbreviation "h" or "hh" (for "hands high"). Thus, a horse described as "15.2 h" is 15 hands plus 2 inches, for a total of [Template:Convert](/wiki/Template:Convert) in height.<ref name=Ensminger51>[Ensminger](/wiki/#Ensminger), p. 51</ref>

[thumb|left|upright=1.4|Size varies greatly among horse breeds, as with this full-sized horse and small pony.|alt=A large brown horse is chasing a small horse in a pasture.](/wiki/File:Horse-and-pony.jpg) The size of horses varies by breed, but also is influenced by [nutrition](/wiki/Equine_nutrition). Light riding horses usually range in height from [Template:Hands](/wiki/Template:Hands) and can weigh from [Template:Convert](/wiki/Template:Convert).[[16]](#cite_note-16) Larger riding horses usually start at about [Template:Hands](/wiki/Template:Hands) and often are as tall as [Template:Hands](/wiki/Template:Hands), weighing from [Template:Convert](/wiki/Template:Convert).[[17]](#cite_note-17) Heavy or [draft horses](/wiki/Draft_horse) are usually at least [Template:Hands](/wiki/Template:Hands) high and can be as tall as [Template:Hands](/wiki/Template:Hands) high. They can weigh from about [Template:Convert](/wiki/Template:Convert).[[18]](#cite_note-18) The largest horse in recorded history was probably a [Shire horse](/wiki/Shire_horse) named [Mammoth](/wiki/Sampson_(horse)), who was born in 1848. He stood [Template:Hands](/wiki/Template:Hands) high and his peak weight was estimated at [Template:Convert](/wiki/Template:Convert).<ref name=Whitaker60>[Whitaker](/wiki/#Whitaker), p. 60</ref> The current record holder for the world's smallest horse is [Thumbelina](/wiki/Thumbelina_(horse)), a fully mature [miniature horse](/wiki/Miniature_horse) affected by [dwarfism](/wiki/Dwarfism). She is [Template:Convert](/wiki/Template:Convert) tall and weighs [Template:Convert](/wiki/Template:Convert).[[19]](#cite_note-19)

#### Ponies[[edit](/index.php?title=(none)&action=edit&section=4)]

[Template:Main](/wiki/Template:Main) Ponies are [taxonomically](/wiki/Taxonomy_(biology)) the same animals as horses. The distinction between a horse and pony is commonly drawn on the basis of height, especially for competition purposes. However, height alone is not dispositive; the difference between horses and ponies may also include aspects of [phenotype](/wiki/Phenotype), including conformation and temperament.

The traditional standard for height of a horse or a [pony](/wiki/Pony) at maturity is [Template:Hands](/wiki/Template:Hands). An animal 14.2 h or over is usually considered to be a horse and one less than 14.2 h a pony,<ref name=EnsmingerHT11>[Template:Cite book](/wiki/Template:Cite_book)</ref> but there are many exceptions to the traditional standard. In Australia, ponies are considered to be those under [Template:Hands](/wiki/Template:Hands),[[20]](#cite_note-20) For competition in the [Western](/wiki/Western_riding) division of the [United States Equestrian Federation](/wiki/United_States_Equestrian_Federation), the cutoff is [Template:Hands](/wiki/Template:Hands)[[21]](#cite_note-21) The [International Federation for Equestrian Sports](/wiki/International_Federation_for_Equestrian_Sports), the world governing body for horse sport, uses [metric](/wiki/Metric_system) measurements and defines a pony as being any horse measuring less than [Template:Convert](/wiki/Template:Convert) at the withers without shoes, which is just over 14.2 h, and [Template:Convert](/wiki/Template:Convert), or just over 14.2½ h, with shoes.[[22]](#cite_note-22) Height is not the sole criterion for distinguishing horses from ponies. [Breed registries](/wiki/Breed_registry) for horses that typically produce individuals both under and over 14.2 h consider all animals of that breed to be horses regardless of their height.[[23]](#cite_note-23) Conversely, some pony breeds may have features in common with horses, and individual animals may occasionally mature at over 14.2 h, but are still considered to be ponies.[[24]](#cite_note-24) Ponies often exhibit thicker manes, tails, and overall coat. They also have proportionally shorter legs, wider barrels, heavier bone, shorter and thicker necks, and short heads with broad foreheads. They may have calmer temperaments than horses and also a high level of intelligence that may or may not be used to cooperate with human handlers.<ref name=EnsmingerHT11/> Small size, by itself, is not an exclusive determinant. For example, the [Shetland pony](/wiki/Shetland_pony) which averages [Template:Hands](/wiki/Template:Hands), is considered a pony.<ref name=EnsmingerHT11/> Conversely, breeds such as the [Falabella](/wiki/Falabella) and other [miniature horses](/wiki/Miniature_horse), which can be no taller than [Template:Convert](/wiki/Template:Convert), are classified by their [registries](/wiki/Breed_registry) as very small horses, not ponies.[[25]](#cite_note-25)

### Genetics[[edit](/index.php?title=(none)&action=edit&section=5)]

Horses have 64 [chromosomes](/wiki/Chromosomes).[[26]](#cite_note-26) The [horse genome](/wiki/Horse_genome) was [sequenced](/wiki/DNA_sequencing) in 2007. It contains 2.7 billion DNA [base pairs](/wiki/Base_pairs),<ref name=Cornell>[Template:Cite web](/wiki/Template:Cite_web)</ref> which is larger than the [dog genome](/wiki/Dog_genome), but smaller than the [human genome](/wiki/Human_genome) or the [bovine genome](/wiki/Bovine_genome).<ref name=ScienceDaily>[Template:Cite web](/wiki/Template:Cite_web)</ref> The map is available to researchers.[[27]](#cite_note-27)

### Colors and markings[[edit](/index.php?title=(none)&action=edit&section=6)]

[thumb|upright=1.4|](/wiki/File:Horsescd1l-095.jpg)[Bay](/wiki/Bay_(horse)) (left) and [chestnut](/wiki/Chestnut_(coat)) (sometimes called "sorrel") are two of the most common coat colors, seen in almost all breeds.|alt=Two horses in a field. The one on the left is a dark brown with black mane and tail. The one on the right is a light red all over. [Template:Main](/wiki/Template:Main)

Horses exhibit a diverse array of [coat colors](/wiki/Equine_coat_color) and distinctive [markings](/wiki/Horse_markings), described by a specialized vocabulary. Often, a horse is classified first by its coat color, before breed or sex.[[28]](#cite_note-28) Horses of the same color may be distinguished from one another by white [markings](/wiki/Horse_markings),[[29]](#cite_note-29) which, along with various spotting patterns, are inherited separately from coat color.[[30]](#cite_note-30) Many [genes](/wiki/Equine_coat_color_genetics) that create horse coat colors and patterns have been identified. Current genetic tests can identify at least 13 different [alleles](/wiki/Allele) influencing coat color,<ref name=UCVGL/> and research continues to discover new genes linked to specific traits. The basic coat colors of [chestnut](/wiki/Chestnut_(coat)) and [black](/wiki/Black_(horse)) are determined by the [gene](/wiki/Gene) controlled by the [Melanocortin 1 receptor](/wiki/Melanocortin_1_receptor),<ref name=Marklund1996>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> also known as the "extension gene" or "red factor,"<ref name=UCVGL/> as its recessive form is "red" (chestnut) and its dominant form is black.<ref name=UCDIntro/> Additional [genes](/wiki/Gene) control suppression of black color to [point coloration](/wiki/Point_coloration) that results in a [bay](/wiki/Bay_(horse)), spotting patterns such as [pinto](/wiki/Pinto_horse) or [leopard](/wiki/Leopard_complex), [dilution genes](/wiki/Dilution_gene) such as [palomino](/wiki/Palomino) or [dun](/wiki/Dun_gene), as well as [graying](/wiki/Gray_(horse)), and all the other factors that create the many possible coat colors found in horses.<ref name=UCVGL>[Template:Cite web](/wiki/Template:Cite_web)</ref>

Horses which have a white coat color are often mislabeled; a horse that looks "white" is usually a middle-aged or older [gray](/wiki/Gray_(horse)). Grays are born a darker shade, get lighter as they age, but usually keep black skin underneath their white hair coat (with the exception of pink skin under white [markings](/wiki/Horse_markings)). The only horses properly called [white](/wiki/White_(horse)) are born with a predominantly white hair coat and pink skin, a fairly rare occurrence.<ref name=UCDIntro>[Template:Cite web](/wiki/Template:Cite_web)</ref> Different and unrelated [genetic](/wiki/Genetics) factors can produce white coat colors in horses, including several different alleles of [dominant white](/wiki/Dominant_white) and the [sabino-1 gene](/wiki/Sabino_horse).<ref name=haase2009-similar>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> However, there are no "[albino](/wiki/Albinism)" horses, defined as having both pink skin and red eyes.<ref name=Duplicatetest>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>

### Reproduction and development[[edit](/index.php?title=(none)&action=edit&section=7)]

[Template:Main](/wiki/Template:Main)

[Gestation](/wiki/Gestation) lasts approximately 340 days, with an average range 320–370 days,<ref name=Ensminger156>[Ensminger](/wiki/#Ensminger), p. 156</ref> and usually results in one [foal](/wiki/Foal); twins are rare.[[31]](#cite_note-31) Horses are a [precocial](/wiki/Precocial) species, and foals are capable of standing and running within a short time following birth.[[32]](#cite_note-32) Foals are usually born in the spring. The [estrous cycle](/wiki/Estrous_cycle) of a mare occurs roughly every 19–22 days and occurs from early spring into autumn. Most mares enter an *anestrus* period during the winter and thus do not cycle in this period.<ref name=Ensminger150>[Ensminger](/wiki/#Ensminger), p. 150</ref> Foals are generally [weaned](/wiki/Weaning) from their mothers between four and six months of age.[[33]](#cite_note-33) Horses, particularly colts, sometimes are physically capable of reproduction at about 18 months, but domesticated horses are rarely allowed to breed before the age of three, especially females.<ref name=HorseTack129>[Template:Cite book](/wiki/Template:Cite_book)</ref> Horses four years old are considered mature, although the skeleton normally continues to develop until the age of six; maturation also depends on the horse's size, breed, sex, and quality of care. Larger horses have larger bones; therefore, not only do the bones take longer to form [bone tissue](/wiki/Osseous_tissue), but the [epiphyseal plates](/wiki/Epiphyseal_plate) are larger and take longer to convert from [cartilage](/wiki/Cartilage) to bone. These plates convert after the other parts of the bones, and are crucial to development.[[34]](#cite_note-34) Depending on maturity, breed, and work expected, horses are usually put under saddle and [trained](/wiki/Horse_training) to be ridden between the ages of two and four.<ref name=Train163>[Template:Cite book](/wiki/Template:Cite_book)</ref> Although [Thoroughbred](/wiki/Thoroughbred) [race horses](/wiki/Horse_racing) are put on the track as young as the age of two in some countries,[[35]](#cite_note-35) horses specifically bred for sports such as [dressage](/wiki/Dressage) are generally not put under saddle until they are three or four years old, because their bones and muscles are not solidly developed.[[36]](#cite_note-36) For [endurance riding](/wiki/Endurance_riding) competition, horses are not deemed mature enough to compete until they are a full 60 calendar months (five years) old.<ref name=Endurance/>

### Anatomy[[edit](/index.php?title=(none)&action=edit&section=8)]

[Template:Main](/wiki/Template:Main)

#### Skeletal system[[edit](/index.php?title=(none)&action=edit&section=9)]

[Template:Main](/wiki/Template:Main) [thumb|upright=1.4|The skeletal system of a modern horse|alt=Diagram of a horse skeleton with major parts labeled.](/wiki/File:Horse_anatomy.svg) The horse skeleton averages 205 bones.<ref name=Evans90>[Template:Cite book](/wiki/Template:Cite_book)</ref> A significant difference between the horse skeleton and that of a human is the lack of a [collarbone](/wiki/Clavicle)—the horse's [forelimbs](/wiki/Equine_forelimb_anatomy) are attached to the [spinal column](/wiki/Vertebral_column) by a powerful set of muscles, tendons, and ligaments that attach the [shoulder blade](/wiki/Scapula) to the torso. The horse's legs and hooves are also unique structures. Their leg bones are proportioned differently from those of a human. For example, the body part that is called a horse's "knee" is actually made up of the [carpal](/wiki/Carpus) bones that correspond to the human [wrist](/wiki/Wrist). Similarly, the [hock](/wiki/Hock_(zoology)) contains bones equivalent to those in the human [ankle](/wiki/Ankle) and [heel](/wiki/Heel). The lower leg bones of a horse correspond to the bones of the human hand or foot, and the [fetlock](/wiki/Equine_anatomy) (incorrectly called the "ankle") is actually the proximal [sesamoid bones](/wiki/Sesamoid_bone) between the [cannon](/wiki/Equine_anatomy) bones (a single equivalent to the human [metacarpal](/wiki/Metacarpus) or [metatarsal](/wiki/Metatarsus) bones) and the [proximal phalanges](/wiki/Proximal_phalanges), located where one finds the "knuckles" of a human. A horse also has no muscles in its legs below the knees and hocks, only skin, hair, bone, [tendons](/wiki/Tendon), [ligaments](/wiki/Ligament), [cartilage](/wiki/Cartilage), and the assorted specialized tissues that make up the [hoof](/wiki/Horse_hoof).<ref name=Ensminger21>[Ensminger](/wiki/#Ensminger), pp. 21–25</ref>

#### Hooves[[edit](/index.php?title=(none)&action=edit&section=10)]

[Template:Main](/wiki/Template:Main)

The critical importance of the feet and legs is summed up by the traditional adage, "no foot, no horse".<ref name=Ensminger367>[Ensminger](/wiki/#Ensminger), p. 367</ref> The [horse hoof](/wiki/Horse_hoof) begins with the [distal phalanges](/wiki/Distal_phalanges), the equivalent of the human fingertip or tip of the toe, surrounded by [cartilage](/wiki/Cartilage) and other specialized, blood-rich soft tissues such as the [laminae](/wiki/Horse_hoof#Internal_structures). The exterior hoof wall and horn of the sole is made of [keratin](/wiki/Keratin), the same material as a human [fingernail](/wiki/Nail_(anatomy)).[[37]](#cite_note-37) The end result is that a horse, weighing on average [Template:Convert](/wiki/Template:Convert),[[38]](#cite_note-38) travels on the same bones as would a human on tiptoe.[[39]](#cite_note-39) For the protection of the hoof under certain conditions, some horses have [horseshoes](/wiki/Horseshoe) placed on their feet by a professional [farrier](/wiki/Farrier). The hoof continually grows, and in most domesticated horses needs to be trimmed (and horseshoes reset, if used) every five to eight weeks,[[40]](#cite_note-40) though the hooves of horses in the wild wear down and regrow at a rate suitable for their terrain.

#### Teeth[[edit](/index.php?title=(none)&action=edit&section=11)]

[Template:Main](/wiki/Template:Main)

Horses are adapted to [grazing](/wiki/Grazing). In an adult horse, there are 12 [incisors](/wiki/Incisor) at the front of the mouth, adapted to biting off the grass or other vegetation. There are 24 teeth adapted for chewing, the [premolars](/wiki/Premolar) and [molars](/wiki/Molar_(tooth)), at the back of the mouth. Stallions and geldings have four additional teeth just behind the incisors, a type of [canine teeth](/wiki/Canine_tooth) called "tushes". Some horses, both male and female, will also develop one to four very small [vestigial](/wiki/Vestigiality) teeth in front of the molars, known as "wolf" teeth, which are generally removed because they can interfere with the [bit](/wiki/Bit_(horse)). There is an empty interdental space between the incisors and the molars where the bit rests directly on the gums, or "bars" of the horse's mouth when the horse is [bridled](/wiki/Bridle).[[41]](#cite_note-41) An estimate of a horse's age can be made from looking at its teeth. The teeth continue to erupt throughout life and are worn down by grazing. Therefore, the incisors show changes as the horse ages; they develop a distinct wear pattern, changes in tooth shape, and changes in the angle at which the chewing surfaces meet. This allows a very rough estimate of a horse's age, although diet and veterinary care can also affect the rate of tooth wear.<ref name=Ensminger46>[Ensminger](/wiki/#Ensminger), pp. 46–50</ref>

#### Digestion[[edit](/index.php?title=(none)&action=edit&section=12)]

[Template:Main](/wiki/Template:Main) Horses are [herbivores](/wiki/Herbivore) with a digestive system adapted to a [forage](/wiki/Forage) diet of grasses and other plant material, consumed steadily throughout the day. Therefore, compared to humans, they have a relatively small stomach but very long intestines to facilitate a steady flow of nutrients. A [Template:Convert](/wiki/Template:Convert) horse will eat [Template:Convert](/wiki/Template:Convert) of food per day and, under normal use, drink [Template:Convert](/wiki/Template:Convert) of [water](/wiki/Water). Horses are not [ruminants](/wiki/Ruminant), they have only one stomach, like humans, but unlike humans, they can utilize [cellulose](/wiki/Cellulose), a major component of grass. Horses are [hindgut fermenters](/wiki/Hindgut_fermentation), Cellulose fermentation by symbiotic bacteria occurs in the [cecum](/wiki/Cecum), or "water gut", which food goes through before reaching the [large intestine](/wiki/Large_intestine). Horses cannot [vomit](/wiki/Vomiting), so digestion problems can quickly cause [colic](/wiki/Horse_colic), a leading cause of death.[[42]](#cite_note-42)

#### Senses[[edit](/index.php?title=(none)&action=edit&section=13)]

[thumb|A horse's eye|alt=Close up of a horse eye, with is dark brown with lashes on the top eyelid](/wiki/File:Pferdeauge.jpg) [Template:See also](/wiki/Template:See_also) The horses' senses are based on their status as [prey animals](/wiki/Predation), where they must be aware of their surroundings at all times.<ref name=Ensminger309>[Ensminger](/wiki/#Ensminger), pp. 309–310</ref> They have the largest eyes of any land mammal,<ref name=Sellnow>[Template:Cite book](/wiki/Template:Cite_book)</ref> and are lateral-eyed, meaning that their eyes are positioned on the sides of their heads.[[43]](#cite_note-43) This means that horses have a range of vision of more than 350°, with approximately 65° of this being [binocular vision](/wiki/Binocular_vision) and the remaining 285° [monocular vision](/wiki/Monocular_vision).<ref name=Sellnow/> Horses have excellent day and [night vision](/wiki/Night_vision), but they have two-color, or [dichromatic vision](/wiki/Dichromacy); their [color vision](/wiki/Color_vision) is somewhat like [red-green color blindness](/wiki/Red–green_color_blindness) in humans, where certain colors, especially red and related colors, appear as a shade of green.[[44]](#cite_note-44) Their [sense of smell](/wiki/Olfaction), while much better than that of humans, is not quite as good as that of a dog. It is believed to play a key role in the social interactions of horses as well as detecting other key scents in the environment. Horses have two olfactory centers. The first system is in the nostrils and nasal cavity, which analyze a wide range of odors. The second, located under the nasal cavity, are the [Vomeronasal organs](/wiki/Vomeronasal_organ), also called Jacobson's organs. These have a separate nerve pathway to the brain and appear to primarily analyze [pheromones](/wiki/Pheromones).[[45]](#cite_note-45) A horse's hearing is good,<ref name=Ensminger309/> and the [pinna](/wiki/Pinna_(anatomy)) of each ear can rotate up to 180°, giving the potential for 360° hearing without having to move the head.[[46]](#cite_note-46) Noise impacts the behavior of horses and certain kinds of noise may contribute to stress: A 2013 study in the UK indicated that stabled horses were calmest in a quiet setting, or if listening to country or classical music, but displayed signs of nervousness when listening to jazz or rock music. This study also recommended keeping music under a volume of 21 [decibels](/wiki/Decibel).[[47]](#cite_note-47) An Australian study found that stabled racehorses listening to talk radio had a higher rate of gastric ulcers than horses listening to music, and racehorses stabled where a radio was played had a higher overall rate of ulceration than horses stabled where there was no radio playing.[[48]](#cite_note-48) Horses have a great sense of balance, due partly to their ability to feel their footing and partly to highly developed [proprioception](/wiki/Proprioception)—the unconscious sense of where the body and limbs are at all times.[[49]](#cite_note-49) A horse's [sense of touch](/wiki/Somatosensory_system) is well developed. The most sensitive areas are around the eyes, ears, and nose.[[50]](#cite_note-50) Horses are able to sense contact as subtle as an insect landing anywhere on the body.[[51]](#cite_note-51) Horses have an advanced sense of taste, which allows them to sort through [fodder](/wiki/Fodder) and choose what they would most like to eat,[[52]](#cite_note-52) and their [prehensile](/wiki/Prehensility) lips can easily sort even small grains. Horses generally will not eat poisonous plants, however, there are exceptions; horses will occasionally eat toxic amounts of poisonous plants even when there is adequate healthy food.[[53]](#cite_note-53)

### Movement[[edit](/index.php?title=(none)&action=edit&section=14)]

[thumb|left|The gallop|alt=Film showing a horse running.](/wiki/File:Muybridge_race_horse_animated.gif) [Template:Main](/wiki/Template:Main) All horses move naturally with four basic [gaits](/wiki/Horse_gait): the four-beat [walk](/wiki/Horse_gait#Walk), which averages [Template:Convert](/wiki/Template:Convert); the two-beat [trot or jog](/wiki/Trot_(horse_gait)) at [Template:Convert](/wiki/Template:Convert) (faster for [harness racing](/wiki/Harness_racing) horses); the [canter or lope](/wiki/Canter), a three-beat gait that is [Template:Convert](/wiki/Template:Convert); and the [gallop](/wiki/Horse_gallop).<ref name=HorseGaits32>[Harris](/wiki/#Harris), p. 32</ref> The gallop averages [Template:Convert](/wiki/Template:Convert),<ref name=Harris47>[Harris](/wiki/#Harris), pp. 47–49</ref> but the world record for a horse galloping over a short, sprint distance is [Template:Convert](/wiki/Template:Convert).<ref name=guinness>[Template:Cite web](/wiki/Template:Cite_web)</ref> Besides these basic gaits, some horses perform a two-beat [pace](/wiki/Pacing_(horse_gait)), instead of the trot.<ref name=HorseGaits50>[Harris](/wiki/#Harris), p. 50</ref> There also are several four-beat "[ambling](/wiki/Ambling)" gaits that are approximately the speed of a trot or pace, though smoother to ride. These include the lateral [rack](/wiki/Ambling#Rack), [running walk](/wiki/Ambling), and [tölt](/wiki/Tölt) as well as the diagonal [fox trot](/wiki/Fox_trot_(gait)).[[54]](#cite_note-54) Ambling gaits are often genetic in some breeds, known collectively as [gaited horses](/wiki/Gaited_horse).[[55]](#cite_note-55) Often, gaited horses replace the trot with one of the ambling gaits.<ref name=HorseGaits51>[Harris](/wiki/#Harris), pp. 50–55</ref>

### Behavior[[edit](/index.php?title=(none)&action=edit&section=15)]

[Template:Main](/wiki/Template:Main) Horses are prey animals with a strong [fight-or-flight response](/wiki/Fight-or-flight_response). Their first reaction to threat is to startle and usually flee, although they will stand their ground and defend themselves when flight is impossible or if their young are threatened.[[56]](#cite_note-56) They also tend to be curious; when startled, they will often hesitate an instant to ascertain the cause of their fright, and may not always flee from something that they perceive as non-threatening. Most light horse riding breeds were developed for speed, agility, alertness and endurance; natural qualities that extend from their wild ancestors. However, through selective breeding, some breeds of horses are quite docile, particularly certain draft horses.<ref name=Natural226>[Template:Cite book](/wiki/Template:Cite_book)</ref>

Horses are [herd animals](/wiki/Herd_animal), with a clear hierarchy of rank, led by a dominant individual, usually a mare. They are also social creatures that are able to form companionship attachments to their own species and to other animals, including humans. They communicate in various ways, including vocalizations such as nickering or whinnying, mutual [grooming](/wiki/Social_grooming), and [body language](/wiki/Body_language). Many horses will become difficult to manage if they are isolated, but with training, horses can learn to accept a human as a companion, and thus be comfortable away from other horses.<ref name=Ensminger305>[Ensminger](/wiki/#Ensminger), pp. 305–309</ref> However, when confined with insufficient companionship, exercise, or stimulation, individuals may develop [stable vices](/wiki/Stable_vices), an assortment of bad habits, mostly [stereotypies](/wiki/Stereotypy_(non-human)) of psychological origin, that include wood chewing, wall kicking, "weaving" (rocking back and forth), and other problems.<ref name=Prince214>[Template:Cite book](/wiki/Template:Cite_book)</ref>

#### Intelligence and learning[[edit](/index.php?title=(none)&action=edit&section=16)]

Studies have indicated that horses perform a number of [cognitive](/wiki/Cognition) tasks on a daily basis, meeting mental challenges that include [food procurement](/wiki/Foraging) and identification of individuals within a [social system](/wiki/Social_structure). They also have good [spatial discrimination](/wiki/Spatial_visualization_ability) abilities.<ref name=Hanggi>[Template:Cite web](/wiki/Template:Cite_web)</ref> Studies have assessed equine intelligence in areas such as [problem solving](/wiki/Problem_solving), speed of learning, and [memory](/wiki/Memory). Horses excel at simple learning, but also are able to use more advanced cognitive abilities that involve [categorization](/wiki/Categorization) and [concept learning](/wiki/Concept_learning). They can learn using [habituation](/wiki/Habituation), [desensitization](/wiki/Desensitization_(psychology)), [classical conditioning](/wiki/Classical_conditioning), and [operant conditioning](/wiki/Operant_conditioning), and positive and negative [reinforcement](/wiki/Reinforcement).<ref name=Hanggi/> One study has indicated that horses can differentiate between "more or less" if the quantity involved is less than four.[[57]](#cite_note-57) Domesticated horses may face greater mental challenges than wild horses, because they live in artificial environments that prevent [instinctive](/wiki/Instinct) behavior whilst also learning tasks that are not natural.<ref name=Hanggi/> Horses are animals of [habit](/wiki/Habit_(psychology)) that respond well to regimentation, and respond best when the same routines and techniques are used consistently. One trainer believes that "intelligent" horses are reflections of intelligent trainers who effectively use response conditioning techniques and positive reinforcement to train in the style that best fits with an individual animal's natural inclinations.[[58]](#cite_note-58)

#### Temperament[[edit](/index.php?title=(none)&action=edit&section=17)]

[Template:Main](/wiki/Template:Main) Horses are [mammals](/wiki/Mammal), and as such are [warm-blooded](/wiki/Warm-blooded), or [endothermic](/wiki/Endotherm) creatures, as opposed to cold-blooded, or [poikilothermic](/wiki/Poikilotherm) animals. However, these words have developed a separate meaning in the context of equine terminology, used to describe temperament, not [body temperature](/wiki/Thermoregulation). For example, the "hot-bloods", such as many [race horses](/wiki/Horse_racing), exhibit more sensitivity and energy,<ref name=Belknap255>[Belknap](/wiki/#Belknap), p. 255</ref> while the "cold-bloods", such as most [draft breeds](/wiki/Draft_horse), are quieter and calmer.<ref name=Belknap112>[Belknap](/wiki/#Belknap), p. 112</ref> Sometimes "hot-bloods" are classified as "light horses" or "riding horses",<ref name=Ensminger71>[Ensminger](/wiki/#Ensminger), pp. 71–73</ref> with the "cold-bloods" classified as "draft horses" or "work horses".<ref name=Ensminger84>[Ensminger](/wiki/#Ensminger), p. 84</ref>

[thumb|upright=1.5|Illustration of assorted breeds; slim, light hotbloods, medium-sized warmbloods and draft and pony-type coldblood breeds|alt=a sepia-toned engraving from an old book, showing 11 horses of different breeds and sizes in nine different illustrations](/wiki/File:Brockhaus_and_Efron_Encyclopedic_Dictionary_b35_043-0.jpg) "Hot blooded" breeds include "[oriental horses](/wiki/Oriental_horse)" such as the [Akhal-Teke](/wiki/Akhal-Teke), [Arabian horse](/wiki/Arabian_horse), [Barb](/wiki/Barb_(horse)) and now-extinct [Turkoman horse](/wiki/Turkoman_horse), as well as the [Thoroughbred](/wiki/Thoroughbred), a breed developed in England from the older oriental breeds.<ref name=Belknap255/> Hot bloods tend to be spirited, bold, and learn quickly. They are bred for agility and speed.<ref name=Catalog18/> They tend to be physically refined—thin-skinned, slim, and long-legged.[[59]](#cite_note-59) The original oriental breeds were brought to Europe from the Middle East and North Africa when European breeders wished to infuse these traits into racing and light [cavalry](/wiki/Cavalry) horses.<ref name=Whitaker43>[Whitaker](/wiki/#Whitaker), p. 43</ref><ref name=Whitaker194>[Whitaker](/wiki/#Whitaker), pp. 194–197</ref>

Muscular, heavy [draft horses](/wiki/Draft_horse) are known as "cold bloods", as they are bred not only for strength, but also to have the calm, patient temperament needed to pull a plow or a heavy carriage full of people.<ref name=Belknap112/> They are sometimes nicknamed "gentle giants".<ref name=Catalog15>[Price](/wiki/#Price), p. 15</ref> Well-known draft breeds include the [Belgian](/wiki/Belgian_(horse)) and the [Clydesdale](/wiki/Clydesdale_(horse)).<ref name=Catalog15/> Some, like the [Percheron](/wiki/Percheron), are lighter and livelier, developed to pull carriages or to plow large fields in drier climates.<ref name=Guide87>[Bongianni](/wiki/#Bongianni), entry 87</ref> Others, such as the [Shire](/wiki/Shire_horse), are slower and more powerful, bred to plow fields with heavy, clay-based soils.<ref name=Ens124>[Ensminger](/wiki/#Ensminger), pp. 124–125</ref> The cold-blooded group also includes some pony breeds.[[60]](#cite_note-60) "[Warmblood](/wiki/Warmblood)" breeds, such as the [Trakehner](/wiki/Trakehner) or [Hanoverian](/wiki/Hanoverian_(horse)), developed when European carriage and [war horses](/wiki/Horses_in_warfare) were crossed with Arabians or Thoroughbreds, producing a riding horse with more refinement than a draft horse, but greater size and milder temperament than a lighter breed.[[61]](#cite_note-61) Certain [pony](/wiki/Pony) breeds with warmblood characteristics have been developed for smaller riders.[[62]](#cite_note-62) Warmbloods are considered a "light horse" or "riding horse".<ref name=Ensminger71/>

Today, the term "Warmblood" refers to a specific subset of [sport horse](/wiki/Sport_horse) breeds that are used for competition in [dressage](/wiki/Dressage) and [show jumping](/wiki/Show_jumping).<ref name=Lyons231>[Template:Cite book](/wiki/Template:Cite_book)</ref> Strictly speaking, the term "[warm blood](/wiki/Warmblood)" refers to any [cross](/wiki/Crossbreeding) between cold-blooded and hot-blooded breeds.<ref name=Belknap523>[Belknap](/wiki/#Belknap), p. 523</ref> Examples include breeds such as the [Irish Draught](/wiki/Irish_Draught) or the [Cleveland Bay](/wiki/Cleveland_Bay). The term was once used to refer to breeds of light riding horse other than Thoroughbreds or Arabians, such as the [Morgan horse](/wiki/Morgan_horse).<ref name=Catalog18>[Price](/wiki/#Price), p. 18</ref>

#### Sleep patterns[[edit](/index.php?title=(none)&action=edit&section=18)]

[Template:See also](/wiki/Template:See_also) [thumb|left|When horses lie down to sleep, others in the herd remain standing, awake or in a light doze, keeping watch.|alt=Two horses in a pasture, one is standing beside the other that is laying down.](/wiki/File:Biandintz_eta_zaldiak_-_modified2.jpg) Horses are able to sleep both standing up and lying down. In an adaptation from life in the wild, horses are able to enter light sleep by using a "[stay apparatus](/wiki/Stay_apparatus)" in their legs, allowing them to doze without collapsing.[[63]](#cite_note-63) Horses sleep better when in groups because some animals will sleep while others stand guard to watch for predators. A horse kept alone will not sleep well because its [instincts](/wiki/Instinct) are to keep a constant eye out for danger.[[64]](#cite_note-64) Unlike humans, horses do not sleep in a solid, unbroken period of time, but take many short periods of rest. Horses spend four to fifteen hours a day in standing rest, and from a few minutes to several hours lying down. Total sleep time in a 24-hour period may range from several minutes to a couple of hours,[[64]](#cite_note-64) mostly in short intervals of about 15 minutes each.<ref name=Ensminger310>[Ensminger](/wiki/#Ensminger), p. 310.</ref> The average sleep time of a domestic horse is said to be 2.9 hours per day.[[65]](#cite_note-65) Horses must lie down to reach [REM sleep](/wiki/Rapid_eye_movement_sleep). They only have to lie down for an hour or two every few days to meet their minimum REM sleep requirements.[[64]](#cite_note-64) However, if a horse is never allowed to lie down, after several days it will become sleep-deprived, and in rare cases may suddenly collapse as it involuntarily slips into REM sleep while still standing.[[66]](#cite_note-66) This condition differs from [narcolepsy](/wiki/Narcolepsy), although horses may also suffer from that disorder.[[67]](#cite_note-67)

## Taxonomy and evolution[[edit](/index.php?title=(none)&action=edit&section=19)]

[thumb|upright=1.5|From left to right: Size development, biometrical changes in the cranium, reduction of toes (left forefoot)](/wiki/File:Equine_evolution.jpg) [Template:Main](/wiki/Template:Main) The horse [adapted](/wiki/Adaptation) to survive in areas of wide-open terrain with sparse vegetation, surviving in an [ecosystem](/wiki/Ecosystem) where other large grazing animals, especially [ruminants](/wiki/Ruminant), could not.[[68]](#cite_note-68) Horses and other equids are [odd-toed ungulates](/wiki/Odd-toed_ungulate) of the [order](/wiki/Order_(biology)) [Perissodactyla](/wiki/Odd-toed_ungulate), a group of mammals that was dominant during the [Tertiary](/wiki/Tertiary) period. In the past, this order contained 14 [families](/wiki/Family_(biology)), but only three—[Equidae](/wiki/Equidae) (the horse and related species), the [tapir](/wiki/Tapir), and the [rhinoceros](/wiki/Rhinoceros)—have survived to the present day.[[69]](#cite_note-69) The earliest known member of the family Equidae was the [*Hyracotherium*](/wiki/Hyracotherium), which lived between 45 and 55 million years ago, during the [Eocene](/wiki/Eocene) period. It had 4 toes on each front foot, and 3 toes on each back foot.[[70]](#cite_note-70) The extra toe on the front feet soon disappeared with the [*Mesohippus*](/wiki/Mesohippus), which lived 32 to 37 million years ago.[[71]](#cite_note-71) Over time, the extra side toes shrank in size until they vanished. All that remains of them in modern horses is a set of small [vestigial](/wiki/Vestigiality) bones on the leg below the knee,<ref name=Natural>[Template:Cite web](/wiki/Template:Cite_web)</ref> known informally as splint bones.[[72]](#cite_note-72) Their legs also lengthened as their toes disappeared until they were a hooved animal capable of running at great speed.<ref name=Natural/> By about 5 million years ago, the modern *Equus* had evolved.<ref name=Florida>[Template:Cite web](/wiki/Template:Cite_web)</ref> Equid teeth also evolved from browsing on soft, tropical plants to adapt to browsing of drier plant material, then to grazing of tougher plains grasses. Thus proto-horses changed from leaf-eating forest-dwellers to grass-eating inhabitants of semi-arid regions worldwide, including the [steppes](/wiki/Steppe) of Eurasia and the [Great Plains](/wiki/Great_Plains) of North America.

By about 15,000 years ago, *Equus ferus* was a widespread [holarctic](/wiki/Holarctic) species. Horse bones from this time period, the late [Pleistocene](/wiki/Pleistocene), are found in Europe, Eurasia, [Beringia](/wiki/Beringia), and North America.<ref name = Weinstock>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Yet between 10,000 and 7,600 years ago, the horse became extinct in North America and rare elsewhere.<ref name = VilaWidespreadOrigins>[Template:Cite journal](/wiki/Template:Cite_journal)</ref><ref name = IberianOrigins>[Template:Cite journal](/wiki/Template:Cite_journal)</ref><ref name=Haile>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> The reasons for this extinction are not fully known, but one theory notes that extinction in North America paralleled human arrival.<ref name = Buck>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Another theory points to climate change, noting that approximately 12,500 years ago, the grasses characteristic of a steppe ecosystem gave way to shrub [tundra](/wiki/Tundra), which was covered with unpalatable plants.[[73]](#cite_note-73)

### Wild species surviving into modern times[[edit](/index.php?title=(none)&action=edit&section=20)]

[thumb|A small herd of Przewalski's Horses|alt=Three tan colored horses with upright manes. Two horses nip and paw at each other, while the third moves towards the camera. They stand in open, rocky grassland, with forests in the distance.](/wiki/File:France_Lozère_Causse_Méjean_Chevaux_de_Przewalski_20.jpg) [Template:Main](/wiki/Template:Main) A truly wild horse is a species or subspecies with no ancestors that were ever domesticated. Therefore, most "wild" horses today are actually [feral horses](/wiki/Feral_horse), animals that escaped or were turned loose from domestic herds and the descendants of those animals.<ref name=Olsen46>[Template:Cite book](/wiki/Template:Cite_book)</ref> Only two never-domesticated subspecies, the [Tarpan](/wiki/Tarpan) and the [Przewalski's Horse](/wiki/Przewalski's_Horse), survived into recorded history and only the latter survives today.

The [Przewalski's horse](/wiki/Przewalski's_horse) (*Equus ferus przewalskii*), named after the Russian explorer [Nikolai Przhevalsky](/wiki/Nikolai_Przhevalsky), is a rare Asian animal. It is also known as the Mongolian wild horse; [Mongolian](/wiki/Mongolia) people know it as the *taki*, and the [Kyrgyz people](/wiki/Kyrgyz_people) call it a *kirtag*. The subspecies was presumed extinct in the wild between 1969 and 1992, while a small breeding population survived in zoos around the world. In 1992, it was reestablished in the wild due to the conservation efforts of numerous zoos.[[74]](#cite_note-74) Today, a small wild breeding population exists in Mongolia.[[75]](#cite_note-75)<ref name=Dohner298>[Dohner](/wiki/#Dohner), pp. 298–299</ref> There are additional animals still maintained at zoos throughout the world.

The [tarpan](/wiki/Tarpan) or European wild horse (*Equus ferus ferus*) was found in Europe and much of Asia. It survived into the historical era, but became [extinct](/wiki/Extinction) in 1909, when the last captive died in a Russian zoo.<ref name=Dohner300>[Dohner](/wiki/#Dohner), p. 300</ref> Thus, the genetic line was lost. Attempts have been made to recreate the tarpan,<ref name=Dohner300/><ref name=OSU>[Template:Cite web](/wiki/Template:Cite_web)</ref>[[76]](#cite_note-76) which resulted in horses with outward physical similarities, but nonetheless descended from domesticated ancestors and not true wild horses.

Periodically, populations of horses in isolated areas are speculated to be [relict](/wiki/Relict) populations of wild horses, but generally have been proven to be feral or domestic. For example, the [Riwoche horse](/wiki/Riwoche_horse) of Tibet was proposed as such,<ref name=Dohner298/> but testing did not reveal genetic differences from domesticated horses.<ref name=Tibet>[Template:Cite book](/wiki/Template:Cite_book)</ref> Similarly, the [Sorraia](/wiki/Sorraia) of Portugal was proposed as a direct descendant of the [Tarpan](/wiki/Tarpan) based on shared characteristics,<ref name=Royo>[Template:Cite journal](/wiki/Template:Cite_journal)</ref><ref name=Edwards>[Edwards](/wiki/#Edwards), pp. 104–105</ref> but genetic studies have shown that the Sorraia is more closely related to other horse breeds and that the outward similarity is an unreliable measure of relatedness.<ref name=Royo/><ref name=Lira/>

### Other modern equids[[edit](/index.php?title=(none)&action=edit&section=21)]

[Template:Main](/wiki/Template:Main) Besides the horse, there are seven other species of [genus](/wiki/Genus) *Equus* in the Equidae [family](/wiki/Family). These are the ass or [donkey](/wiki/Donkey), *Equus asinus*; the [mountain zebra](/wiki/Mountain_zebra), *Equus zebra*; [plains zebra](/wiki/Plains_zebra), *Equus quagga*; [Grévy's zebra](/wiki/Grévy's_Zebra), *Equus grevyi*; the [kiang](/wiki/Kiang), *Equus kiang*; and the [onager](/wiki/Onager), *Equus hemionus*.[[77]](#cite_note-77) Horses can [crossbreed](/wiki/Crossbreed) with other members of their genus. The most common [hybrid](/wiki/Hybrid_(biology)) is the [mule](/wiki/Mule), a cross between a "jack" (male donkey) and a [mare](/wiki/Mare). A related hybrid, a [hinny](/wiki/Hinny), is a cross between a stallion and a [jenny](/wiki/Jenny_(donkey)) (female donkey).[[78]](#cite_note-78) Other hybrids include the [zorse](/wiki/Zorse), a cross between a zebra and a horse.[[79]](#cite_note-79) With rare exceptions, most hybrids are [sterile](/wiki/Infertility) and cannot reproduce.[[80]](#cite_note-80)

## Domestication[[edit](/index.php?title=(none)&action=edit&section=22)]

[Template:Main](/wiki/Template:Main) [thumb|](/wiki/File:Bhimbetka_rock_paintng1.jpg)[Bhimbetka](/wiki/Bhimbetka_rock_shelters) rock painting showing man riding on horse, India Domestication of the horse most likely took place in central Asia prior to 3500 BC. Two major sources of information are used to determine where and when the horse was first domesticated and how the domesticated horse spread around the world. The first source is based on [palaeological](/wiki/Paleontology) and [archaeological](/wiki/Archaeological) discoveries; the second source is a comparison of DNA obtained from modern horses to that from bones and teeth of ancient horse remains.

The earliest archaeological evidence for the [domestication of the horse](/wiki/Domestication_of_the_horse) comes from sites in [Ukraine](/wiki/Ukraine) and [Kazakhstan](/wiki/Kazakhstan), dating to approximately 3500–4000 BC.[[81]](#cite_note-81)[[82]](#cite_note-82)[[83]](#cite_note-83) By 3000 BC, the horse was completely domesticated and by 2000 BC there was a sharp increase in the number of horse bones found in human settlements in northwestern Europe, indicating the spread of domesticated horses throughout the continent.[[84]](#cite_note-84) The most recent, but most irrefutable evidence of domestication comes from sites where horse remains were interred with chariots in graves of the [Sintashta](/wiki/Sintashta) and [Petrovka](/wiki/Petrovka_settlement) cultures c. 2100 BC.[[85]](#cite_note-85) Domestication is also studied by using the genetic material of present-day horses and comparing it with the genetic material present in the bones and teeth of horse remains found in archaeological and palaeological excavations. The variation in the genetic material shows that very few wild stallions contributed to the domestic horse,<ref name=Lau>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>[[86]](#cite_note-86) while many mares were part of early domesticated herds.<ref name=Lira>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>[[87]](#cite_note-87)<ref name=Cai>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> This is reflected in the difference in genetic variation between the DNA that is passed on along the paternal, or sire line ([Y-chromosome](/wiki/Y-chromosome)) versus that passed on along the maternal, or dam line ([mitochondrial DNA](/wiki/Mitochondrial_DNA)). There are very low levels of Y-chromosome variability,[[86]](#cite_note-86) but a great deal of genetic variation in mitochondrial DNA.[[87]](#cite_note-87)<ref name=Cai/> There is also regional variation in mitochondrial DNA due to the inclusion of wild mares in domestic herds.[[87]](#cite_note-87)<ref name=Cai/>[[88]](#cite_note-88) Another characteristic of domestication is an increase in coat color variation.[[89]](#cite_note-89) In horses, this increased dramatically between 5000 and 3000 BC.<ref name=coatColor>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>

Before the availability of DNA techniques to resolve the questions related to the domestication of the horse, various hypotheses were proposed. One classification was based on body types and conformation, suggesting the presence of four basic prototypes that had adapted to their environment prior to domestication.[[60]](#cite_note-60) Another hypothesis held that the four prototypes originated from a single wild species and that all different body types were entirely a result of [selective breeding](/wiki/Selective_breeding) after domestication.[[90]](#cite_note-90) However, the lack of a detectable substructure in the horse has resulted in a rejection of both hypotheses.

### Feral populations[[edit](/index.php?title=(none)&action=edit&section=23)]

[Template:Main](/wiki/Template:Main) [Feral](/wiki/Feral) horses are born and live in the wild, but are descended from domesticated animals.<ref name=Olsen46/> Many populations of [feral horses](/wiki/Feral_horse) exist throughout the world.[[91]](#cite_note-91)[[92]](#cite_note-92) Studies of feral herds have provided useful insights into the behavior of prehistoric horses,[[93]](#cite_note-93) as well as greater understanding of the instincts and behaviors that drive horses that live in domesticated conditions.[[94]](#cite_note-94) There are also [semi-feral](/wiki/Semi-feral) horses in many parts of the world, such as [Dartmoor](/wiki/Dartmoor) and the [New Forest](/wiki/New_Forest) in the UK, where the animals are all privately owned but live for significant amounts of time in "wild" conditions on undeveloped, often public, lands. Owners of such animals often pay a fee for grazing rights.[[95]](#cite_note-95)<ref name=Fear75>[Template:Cite book](/wiki/Template:Cite_book)</ref>

### Breeds[[edit](/index.php?title=(none)&action=edit&section=24)]

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The concept of [purebred](/wiki/Purebred) bloodstock and a controlled, written [breed registry](/wiki/Breed_registry) has come to be particularly significant and important in modern times. Sometimes purebred horses are incorrectly or inaccurately called "thoroughbreds". [Thoroughbred](/wiki/Thoroughbred) is a specific breed of horse, while a "purebred" is a horse (or any other animal) with a defined [pedigree](/wiki/Pedigree_chart) recognized by a breed registry.<ref name=Ensminger424>[Ensminger](/wiki/#Ensminger), p. 424</ref> Horse breeds are groups of horses with distinctive characteristics that are transmitted consistently to their offspring, such as [conformation](/wiki/Equine_conformation), color, performance ability, or disposition. These inherited traits result from a combination of natural crosses and [artificial selection](/wiki/Artificial_selection) methods. Horses have been [selectively bred](/wiki/Selective_breeding) since their [domestication](/wiki/Domestication_of_the_horse). An early example of people who practiced selective [horse breeding](/wiki/Horse_breeding) were the [Bedouin](/wiki/Bedouin), who had a reputation for careful practices, keeping extensive pedigrees of their [Arabian horses](/wiki/Arabian_horse) and placing great value upon pure bloodlines.[[96]](#cite_note-96) These pedigrees were originally transmitted via an [oral tradition](/wiki/Oral_tradition).[[97]](#cite_note-97) In the 14th century, [Carthusian](/wiki/Carthusian) monks of southern Spain kept meticulous pedigrees of bloodstock lineages still found today in the [Andalusian horse](/wiki/Andalusian_horse).[[98]](#cite_note-98) Breeds developed due to a need for "form to function", the necessity to develop certain characteristics in order to perform a particular type of work.<ref name=Sponenberg155>[Sponenberg](/wiki/#Sponenberg), p. 155</ref> Thus, a powerful but refined breed such as the Andalusian developed as riding horses with an aptitude for [dressage](/wiki/Dressage).<ref name=Sponenberg155/> Heavy draft horses developed out of a need to perform demanding [farm](/wiki/Farm) work and pull heavy wagons.[[99]](#cite_note-99) Other horse breeds developed specifically for light agricultural work, carriage and road work, various sport disciplines, or simply as pets.<ref name=Spon162>[Sponenberg](/wiki/#Sponenberg), p. 162</ref> Some breeds developed through centuries of crossing other breeds, while others descended from a single [foundation sire](/wiki/Foundation_bloodstock), or other limited or restricted foundation bloodstock. One of the earliest formal registries was [General Stud Book](/wiki/General_Stud_Book) for Thoroughbreds, which began in 1791 and traced back to the [foundation bloodstock](/wiki/Foundation_bloodstock) for the breed.[[100]](#cite_note-100) There are more than 300 horse breeds in the world today.[[101]](#cite_note-101)

## Interaction with humans[[edit](/index.php?title=(none)&action=edit&section=25)]

[thumb|Equine hospital in the](/wiki/File:Three_Counties_Equine_Hospital_-_geograph.org.uk_-_1770200.jpg) [United Kingdom](/wiki/United_Kingdom) Worldwide, horses play a role within human cultures and have done so for millennia. Horses are used for leisure activities, sports, and working purposes. The [Food and Agriculture Organization](/wiki/Food_and_Agriculture_Organization) (FAO) estimates that in 2008, there were almost 59,000,000 horses in the world, with around 33,500,000 in the Americas, 13,800,000 in Asia and 6,300,000 in Europe and smaller portions in Africa and Oceania. There are estimated to be 9,500,000 horses in the United States alone.[[102]](#cite_note-102) The [American Horse Council](/wiki/American_Horse_Council) estimates that horse-related activities have a direct impact on the economy of the United States of over $39 billion, and when indirect spending is considered, the impact is over $102 billion.[[103]](#cite_note-103) In a 2004 "poll" conducted by [Animal Planet](/wiki/Animal_Planet), more than 50,000 viewers from 73 countries voted for the horse as the world's 4th favorite animal.<ref name=IOL>[Template:Cite web](/wiki/Template:Cite_web)</ref>

Communication between human and horse is paramount in any equestrian activity;[[104]](#cite_note-104) to aid this process horses are usually ridden with a [saddle](/wiki/Saddle) on their backs to assist the rider with balance and positioning, and a [bridle](/wiki/Bridle) or related headgear to assist the rider in maintaining control.[[105]](#cite_note-105) Sometimes horses are ridden without a saddle,[[106]](#cite_note-106) and occasionally, horses are trained to perform without a bridle or other headgear.[[107]](#cite_note-107) Many horses are also [driven](/wiki/Driving_(horse)), which requires a [harness](/wiki/Horse_harness), bridle, and some type of [vehicle](/wiki/Horse-drawn_vehicle).[[108]](#cite_note-108)

### Sport[[edit](/index.php?title=(none)&action=edit&section=26)]

[thumb|upright 1.2|A horse and rider in](/wiki/File:Beijing2008_HOKETSU_Hiroshi.JPG) [dressage](/wiki/Dressage) competition at the [Olympics](/wiki/Equestrian_at_the_Summer_Olympics)|alt=A chestnut (reddish-brown) horse being ridden by a rider in a black coat and top hat. They are stopped in a riding arena with the rider tipping his hat. [Template:Main](/wiki/Template:Main) Historically, equestrians honed their skills through games and races. Equestrian sports provided entertainment for crowds and honed the excellent horsemanship that was needed in battle. Many sports, such as [dressage](/wiki/Dressage), [eventing](/wiki/Eventing) and [show jumping](/wiki/Show_jumping), have origins in [military training](/wiki/Horses_in_warfare), which were focused on control and balance of both horse and rider. Other sports, such as [rodeo](/wiki/Rodeo), developed from practical skills such as those needed on working [ranches](/wiki/Ranch) and [stations](/wiki/Station_(Australian_agriculture)). Sport hunting from horseback evolved from earlier practical hunting techniques.[[104]](#cite_note-104) [Horse racing](/wiki/Horse_racing) of all types evolved from impromptu competitions between riders or drivers. All forms of competition, requiring demanding and specialized skills from both horse and rider, resulted in the systematic development of specialized breeds and equipment for each sport. The popularity of equestrian sports through the centuries has resulted in the preservation of skills that would otherwise have disappeared after horses stopped being used in combat.[[104]](#cite_note-104) Horses are trained to be ridden or driven in a variety of sporting competitions. Examples include [show jumping](/wiki/Show_jumping), [dressage](/wiki/Dressage), three-day [eventing](/wiki/Eventing), [competitive driving](/wiki/Combined_driving), [endurance riding](/wiki/Endurance_riding), [gymkhana](/wiki/Gymkhana_(equestrian)), [rodeos](/wiki/Rodeo), and [fox hunting](/wiki/Fox_hunting).[[109]](#cite_note-109) [Horse shows](/wiki/Horse_show), which have their origins in medieval European fairs, are held around the world. They host a huge range of classes, covering all of the mounted and harness disciplines, as well as ["In-hand"](/wiki/Halter_(horse_show)) classes where the horses are led, rather than ridden, to be evaluated on their conformation. The method of judging varies with the discipline, but winning usually depends on style and ability of both horse and rider.[[110]](#cite_note-110)Sports such as [polo](/wiki/Polo) do not judge the horse itself, but rather use the horse as a partner for human competitors as a necessary part of the game. Although the horse requires specialized training to participate, the details of its performance are not judged, only the result of the rider's actions—be it getting a ball through a goal or some other task.<ref name=Edwards360>[Edwards](/wiki/#Edwards), p. 360</ref> Examples of these sports of partnership between human and horse include [jousting](/wiki/Jousting), in which the main goal is for one rider to unseat the other,[[111]](#cite_note-111) and [buzkashi](/wiki/Buzkashi), a team game played throughout [Central Asia](/wiki/Central_Asia), the aim being to capture a goat carcass while on horseback.<ref name=Edwards360/>

[Horse racing](/wiki/Horse_racing) is an equestrian sport and major international industry, watched in almost every nation of the world. There are three types: "flat" racing; [steeplechasing](/wiki/Steeplechase), i.e. racing over jumps; and [harness racing](/wiki/Harness_racing), where horses trot or pace while pulling a driver in a small, light cart known as a [sulky](/wiki/Sulky).[[112]](#cite_note-112) A major part of horse racing's economic importance lies in the [gambling](/wiki/Gambling#Parimutuel_betting) associated with it.[[113]](#cite_note-113)

### Work[[edit](/index.php?title=(none)&action=edit&section=27)]

[thumb|A mounted police officer in Poland|alt=A mounted man in a blue uniform on a dark brown horse](/wiki/File:Policja_konna_Poznań.jpg) There are certain jobs that horses do very well, and no technology has yet developed to fully replace them. For example, [mounted police](/wiki/Mounted_police) horses are still effective for certain types of patrol duties and crowd control.[[114]](#cite_note-114) Cattle [ranches](/wiki/Ranch) still require riders on horseback to round up cattle that are scattered across remote, rugged terrain.[[115]](#cite_note-115) [Search and rescue](/wiki/Search_and_rescue) organizations in some countries depend upon [mounted](/wiki/Mounted_search_and_rescue) teams to locate people, particularly hikers and children, and to provide disaster relief assistance.[[116]](#cite_note-116) Horses can also be used in areas where it is necessary to avoid vehicular disruption to delicate soil, such as nature reserves. They may also be the only form of transport allowed in [wilderness areas](/wiki/Wilderness_area). Horses are quieter than motorized vehicles. [Law enforcement officers](/wiki/Law_enforcement_officer) such as [park rangers](/wiki/Park_ranger) or [game wardens](/wiki/Game_warden) may use horses for patrols, and horses or mules may also be used for clearing trails or other work in areas of rough terrain where vehicles are less effective.[[117]](#cite_note-117)[thumb|Tanga (carriage) at Darbhanga Bihar](/wiki/File:Tanga_(carriage)_at_Darbhanga_Bihar.jpg) Although machinery has replaced horses in many parts of the world, an estimated 100 million horses, donkeys and mules are still used for agriculture and transportation in less developed areas. This number includes around 27 million [working animals](/wiki/Working_animal) in Africa alone.[[118]](#cite_note-118) Some land management practices such as cultivating and logging can be efficiently performed with horses. In agriculture, less fossil fuel is used and increased environmental conservation occurs over time with the use of [draft animals](/wiki/Working_animal) such as horses.[[119]](#cite_note-119)[[120]](#cite_note-120) Logging with horses can result in reduced damage to soil structure and less damage to trees due to more selective logging.[[121]](#cite_note-121)

### Entertainment and culture[[edit](/index.php?title=(none)&action=edit&section=28)]

[thumb|The horse-headed deity in Hinduism,](/wiki/File:Hayagreeva.jpg) [Hayagriva](/wiki/Hayagriva) [Template:See also](/wiki/Template:See_also) Modern horses are often used to reenact many of their historical work purposes. Horses are used, complete with equipment that is authentic or a meticulously recreated replica, in various live action [historical reenactments](/wiki/Historical_reenactment) of specific periods of history, especially recreations of famous battles.[[122]](#cite_note-122) Horses are also used to preserve cultural traditions and for ceremonial purposes. Countries such as the United Kingdom still use horse-drawn carriages to convey royalty and other VIPs to and from certain culturally significant events.[[123]](#cite_note-123) Public exhibitions are another example, such as the [Budweiser Clydesdales](/wiki/Budweiser_Clydesdales), seen in parades and other public settings, a team of [draft horses](/wiki/Draft_horse) that pull a beer wagon similar to that used before the invention of the modern motorized truck.[[124]](#cite_note-124) Horses are frequently seen in television, films and literature. They are sometimes featured as a major character in films about particular animals, but also used as visual elements that assure the accuracy of historical stories.[[125]](#cite_note-125) Both live horses and [iconic](/wiki/Secular_icon) images of horses are used in [advertising](/wiki/Advertising) to promote a variety of products.[[126]](#cite_note-126) The horse frequently appears in coats of arms in [heraldry](/wiki/Heraldry), in a variety of poses and equipment.[[127]](#cite_note-127) The [mythologies](/wiki/Mythology) of many cultures, including [Greco-Roman](/wiki/Greco-Roman_mythology), [Hindu](/wiki/Hindu_mythology), [Islamic](/wiki/Islamic_mythology), and [Norse](/wiki/Norse_mythology), include references to both normal horses and those with wings or additional limbs, and multiple myths also call upon the horse to draw the chariots of the Moon and Sun.[[128]](#cite_note-128) The horse also appears in the 12-year cycle of animals in the [Chinese zodiac](/wiki/Chinese_astrology) related to the [Chinese calendar](/wiki/Chinese_calendar).[[129]](#cite_note-129)

### Therapeutic use[[edit](/index.php?title=(none)&action=edit&section=29)]

[Template:See also](/wiki/Template:See_also) People of all ages with physical and mental disabilities obtain beneficial results from association with horses. Therapeutic riding is used to mentally and physically stimulate disabled persons and help them improve their lives through improved balance and coordination, increased self-confidence, and a greater feeling of freedom and independence.[[130]](#cite_note-130) The benefits of equestrian activity for people with disabilities has also been recognized with the addition of equestrian events to the [Paralympic Games](/wiki/Paralympic_Games) and recognition of [para-equestrian](/wiki/Para-equestrian) events by the [International Federation for Equestrian Sports](/wiki/International_Federation_for_Equestrian_Sports) (FEI).[[131]](#cite_note-131) [Hippotherapy](/wiki/Hippotherapy) and [therapeutic horseback riding](/wiki/Therapeutic_horseback_riding) are names for different physical, occupational, and speech therapy treatment strategies that utilize equine movement. In hippotherapy, a therapist uses the horse's movement to improve their patient's cognitive, coordination, balance, and fine motor skills, whereas therapeutic horseback riding uses specific riding skills.[[132]](#cite_note-132) Horses also provide psychological benefits to people whether they actually ride or not. "Equine-assisted" or "equine-facilitated" therapy is a form of experiential [psychotherapy](/wiki/Psychotherapy) that uses horses as companion animals to assist people with mental illness, including anxiety disorders, psychotic disorders, mood disorders, behavioral difficulties, and those who are going through major life changes.[[133]](#cite_note-133) There are also experimental programs using horses in [prison](/wiki/Prison) settings. Exposure to horses appears to improve the behavior of inmates and help reduce [recidivism](/wiki/Recidivism) when they leave.[[134]](#cite_note-134)

### Warfare[[edit](/index.php?title=(none)&action=edit&section=30)]

[Template:Main](/wiki/Template:Main) [thumb|](/wiki/File:Bundesarchiv_Bild_146-1970-073-17,_Türkische_Kavallerie_südlich_von_Jerusalem.jpg)[Turkish](/wiki/Ottoman_Empire) cavalry, 1917|alt=Black and white photo of mounted soldiers with middle eastern headwraps, carrying rifles, walking down a road away from the camera Horses have been used in warfare for most of recorded history. The first archaeological evidence of horses used in warfare dates to between 4000 and 3000 BC,[[135]](#cite_note-135) and the use of horses in warfare was widespread by the end of the [Bronze Age](/wiki/Bronze_Age).[[136]](#cite_note-136)<ref name=Whitaker30>[Whitaker](/wiki/#Whitaker), pp. 30–31</ref> Although mechanization has largely replaced the horse as a weapon of war, horses are still seen today in limited military uses, mostly for ceremonial purposes, or for reconnaissance and transport activities in areas of rough terrain where motorized vehicles are ineffective. Horses have been used in the 21st century by the [Janjaweed](/wiki/Janjaweed) militias in the [War in Darfur](/wiki/War_in_Darfur).[[137]](#cite_note-137)

### Products[[edit](/index.php?title=(none)&action=edit&section=31)]

Horses are raw material for many products made by humans throughout history, including byproducts from the slaughter of horses as well as materials collected from living horses.

Products collected from living horses include mare's milk, used by people with large horse herds, such as the [Mongols](/wiki/Mongols), who let it ferment to produce [kumis](/wiki/Kumis).<ref name=NewYorker>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Horse blood was once used as food by the Mongols and other [nomadic](/wiki/Nomad) tribes, who found it a convenient source of nutrition when traveling. Drinking their own horses' blood allowed the Mongols to ride for extended periods of time without stopping to eat.<ref name=NewYorker/> The drug [Premarin](/wiki/Premarin) is a mixture of [estrogens](/wiki/Estrogen) extracted from the urine of pregnant mares (**pre**gnant **mar**es' ur**in**e), and was previously a widely used drug for [hormone replacement therapy](/wiki/Hormone_replacement_therapy_(menopause)).[[138]](#cite_note-138) The tail hair of horses can be used for making [bows](/wiki/Bow_(music)) for [string instruments](/wiki/String_instrument) such as the [violin](/wiki/Violin), [viola](/wiki/Viola), [cello](/wiki/Cello), and [double bass](/wiki/Double_bass).[[139]](#cite_note-139) [Horse meat](/wiki/Horse_meat) has been used as food for humans and [carnivorous animals](/wiki/Carnivore) throughout the ages. It is eaten in many parts of the world, though consumption is [taboo](/wiki/Taboo) in some cultures,<ref name=USDA>[Template:Cite web](/wiki/Template:Cite_web)</ref> and a subject of political controversy in others.[[140]](#cite_note-140) Horsehide leather has been used for boots, gloves, [jackets](/wiki/A-2_jacket),[[141]](#cite_note-141) [baseballs](/wiki/Baseball_(ball)),[[142]](#cite_note-142) and baseball gloves. Horse hooves can also be used to produce [animal glue](/wiki/Animal_glue).[[143]](#cite_note-143) Horse bones can be used to make implements.[[144]](#cite_note-144) Specifically, in Italian cuisine, the horse [tibia](/wiki/Tibia) is sharpened into a probe called a *spinto*, which is used to test the readiness of a (pig) ham as it cures.[[145]](#cite_note-145) In Asia, the saba is a horsehide vessel used in the production of [kumis](/wiki/Kumis).[[146]](#cite_note-146)

### Care[[edit](/index.php?title=(none)&action=edit&section=32)]

[Template:Main](/wiki/Template:Main) [Template:See also](/wiki/Template:See_also) [thumb|left|Checking teeth and other physical examinations are an important part of horse care.|alt=A young man in US military clothing examines the teeth of a bay (dark brown) horse, while another person in military work clothing, partially obscured, holds the horse. Several other people are partially visible in the background.](/wiki/File:Army.mil-2008-04-18-100048.jpg) Horses are [grazing](/wiki/Grazing) animals, and their major source of nutrients is good-quality [forage](/wiki/Forage) from [hay](/wiki/Hay) or [pasture](/wiki/Pasture).[[147]](#cite_note-147) They can consume approximately 2% to 2.5% of their body weight in dry feed each day. Therefore, a [Template:Convert](/wiki/Template:Convert) adult horse could eat up to [Template:Convert](/wiki/Template:Convert) of food.[[148]](#cite_note-148) Sometimes, concentrated feed such as [grain](/wiki/Cereal) is fed in addition to pasture or hay, especially when the animal is very active.[[149]](#cite_note-149) When grain is fed, equine nutritionists recommend that 50% or more of the animal's diet by weight should still be forage.[[150]](#cite_note-150) Horses require a plentiful supply of clean water, a minimum of [Template:Convert](/wiki/Template:Convert) to [Template:Convert](/wiki/Template:Convert) per day.[[151]](#cite_note-151) Although horses are adapted to live outside, they require shelter from the wind and [precipitation](/wiki/Precipitation_(meteorology)), which can range from a simple shed or shelter to an elaborate [stable](/wiki/Stable).[[152]](#cite_note-152) Horses require routine [hoof](/wiki/Horse_hoof) care from a [farrier](/wiki/Farrier), as well as [vaccinations](/wiki/Vaccination) to protect against various diseases, and [dental](/wiki/Horse_teeth) examinations from a [veterinarian](/wiki/Veterinarian) or a specialized equine dentist.[[153]](#cite_note-153) If horses are kept inside in a barn, they require regular daily exercise for their physical health and mental well-being.[[154]](#cite_note-154) When turned outside, they require well-maintained, sturdy [fences](/wiki/Agricultural_fencing) to be safely contained.[[155]](#cite_note-155) Regular [grooming](/wiki/Horse_grooming) is also helpful to help the horse maintain good health of the hair coat and underlying skin.[[156]](#cite_note-156) [Template:Clear](/wiki/Template:Clear)

## See also[[edit](/index.php?title=(none)&action=edit&section=33)]

* [Glossary of equestrian terms](/wiki/Glossary_of_equestrian_terms)

## References[[edit](/index.php?title=(none)&action=edit&section=34)]

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## Sources[[edit](/index.php?title=(none)&action=edit&section=35)]

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## Further reading[[edit](/index.php?title=(none)&action=edit&section=36)]

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* [Template:Britannica](/wiki/Template:Britannica)
* ["Ancient horse bone yields oldest DNA sequence"](http://www.bbc.co.uk/news/science-environment-23060993)

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