

Overview of Camel Life

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ABSTRACT

Camels, large herbivorous mammals of the genus *Camelus*, are very adapted to survive in extreme environments, specially deserts. They have distinctive physical characteristics, such as humps that store fat, tolerating them to survive long periods without food or water. These animals play an important role in transport, trade and providing resources such as milk, meat and wool. Historically, camels simplified trade across the Silk Road, bridging cultures and economies. The geographic distribution of camels covers arid regions, with camels mostly in the Middle East and North Africa and humpback camels in Central Asia. The breeding season of camels is synchronized with the colder months, which confirms best conditions for the survival of the offspring. Camels' ability to succeed in occasional vegetation and their resistance to disease make them an essential part of human survival in severe climates. Vaccination and disease control actions are essential to maintain camel health and productivity in stimulating environments.

Keywords: Camels, Desert Adaptation, Breeding, Disease Prevention, Geographical Distribution, Vaccination

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Introduction

Camels are large ungulates going to the genus *Camelus* of the family *Camelidae*. They have humps, which are essentially fat stores that can be metabolized for energy. This countenances them to survive in some of the most unfriendly environments on Earth, especially deserts. They have a hump or two and can thrive in dangerous temperatures even after lengthy periods without water or food. These features make them vigorous for transportation and survival in desert areas. Despite their wild arrival, camels are passive and social creatures and are typically trained for their effectiveness. "Desert" camels carry heavy loads over long distances and are therefore a great necessity for trade and human civilization. Since early times, camels have been used to transport silk, spices and precious metals across massive deserts, bridging economies and cultures. They carried up to 600 pounds of goods such as salt and gold in areas such as the Sahara and the Arabian Peninsula. Domesticated around 3,000–2,500 BCE, camels were important in the transportation of merchandises and people across arid lands where other animals like horses could not survive. They also provided milk, meat, leather, and wool, which are very essential for desert life. The strength and adaptability of camels have made them the keystone of early human economies, allowing survival in some of the harshest environments on Earth(1).

Geographical distribution of camel

Camels are mainly found in arid and semi-arid regions of the world, and there are two main species adapted to different climates. The dromedary camel, *Camelus dromedarius*, with one hump, is mainly found in North Africa, the Middle East, and parts of South Asia, especially in desert and steppe areas. It occurs natively in the large deserts of the Sahara and Arabian Peninsula. Its existence is fundamental to the livelihoods of the nomadic pastoralists of Somalia, Ethiopia, and Kenya. Dromedaries have also been introduced into Australia, where they live very well in the arid interior, creating one of the largest wild camel populations in the world. South Asia has very many domesticated populations. These include India and Pakistan, where camels are used for transport, agriculture and cultural actions. The two-humped camel (*Camelus bactrianus*) is obviously found in the cold deserts and plains of Central Asia in Mongolia, the Gobi Desert and northern China. This species is best adapted to extreme climatic environments in hot summer seasons and cold temperatures in winter. Humpbacked camels are also protuberant in Kazakhstan and southern parts of Russia and are vital to the nomadism dominant in these geographical areas. A small population of wild camels (*Camelus ferus*) exist in remote parts of the Gobi and Taklamakan deserts, though they are analytically rare. Camels have been introduced to additional regions such as Europe and North America, where they are often kept in zoos, nature parks or for tourism (2).

Breeding season of camels

The breeding season for camels is typically in the cooler months vary by region. Dromedary camels have a breeding season in the winter, between November and March. Camels breed from December to April. Their

breeding season is unwavering by environmental influences such as temperature, food and water availability to certify that they give birth under more promising conditions for offspring survival. This breeding cycle certifies that calves are born in the spring in very variable temperature areas such as Central Asia and Mongolia, when food is abundant and temperatures increase. During the breeding season, camels experience dramatic behavioral changes due to increased testosterone levels. They become very territorial and even fight other males to achieve domination. To attract females, males inflate a soft sac in their throats, called the dulaa, which they project from their mouths along with loud discourses and frothy saliva. They also spray urine on themselves and rub their necks on the ground or substances to signal their readiness to companion. Female camels exhibit estrous behavior by becoming more receptive, exhibiting behavioral changes and even showing swelling of the vulva as physical signs. Mating occurs in a peculiar kneeled position and lasts for approximately 10–20 minutes. After mating, the pregnant female will have a protracted gestation period at about 370–390 days, thus ensuring favorable conditions at the time of calving. Environmental conditions can influence breeding cycles, especially in domesticated camels where management practices may influence the timing of mating. Table number one shows the common disease of camel(3).

Feeding of camel

Camels are herbivorous animals with very versatile feeding behavior. They survive in arid environments where food is scarce and of low quality. They feed on many different types of plants, including grasses, leaves, shrubs, thorny plants, and even saline vegetation such as halophytes. Camels are both grazers and browsers; they feed on grass when it is abundant and shrubs and trees in drier times. They can eat thorny plants such as acacia without injury because they have hard, leathery lips. Their ability to tolerate saline plants and semi-saline water further aids their survival in harsh environments. Camels can store energy in their humps as fat to sustain them during food shortages, allowing them to go long periods without food. Their three-chambered stomach allows efficient breakdown of fibrous plants through microbial fermentation, and they excel at extracting moisture from food, which reduces water consumption. In the domestic environment, camels are usually fed fodder such as hay, dry grass and straw, cereals, concentrates and mineral supplements to ensure adequate nutrition. Their slow digestion and seasonal adaptations allow them to survive during dry periods when there is little vegetation and use stored fat for energy. This infrequent feeding plan makes camels survive in some of the harshest environments on Earth (4-5).

Reproductive cycle of camel

Environmental factors such as food, water availability, and weather affect the reproductive cycle of camels. Female camels have a seasonally polyestrous cycle characterized by multiple cycles during the cooler breeding season. The estrous cycle takes approximately 28 days, and estrus usually lasts from 3–4 days when the female is sexually receptive. Estrus in females is indicated by swelling of the vulva, increased vocalization, and

attraction towards males. Camels are induced ovulators, meaning that ovulation occurs after mating or stimulation. If mating does not occur, the female will cycle again after a few weeks. During the breeding season, male camels display courtship behaviors, such as inflating the dulaa (a soft palate), producing loud vocalizations, and spraying urine to mark their territory and attract females. They breed during female mounting and lasts approximately 10–20 minutes. In the case of camels, gestation takes up around 370–390 days or almost 13 months. Normally, just one calf is born while rarely a calf may even be a twin. Camels also experience pregnant female immobility, a behavior which will take the animal to remote places

or isolated areas and normally delivers its newborn there itself. Newborn camels weigh 30–40 kilograms and can stand and suckle within hours of birth. Lactation lasts for 12–18 months, although calves begin grazing earlier. Camels reach sexual maturity at around 3–4 years for females and 5–6 years for males. Breeding and calving are timed to coincide with cooler months, thus increasing the chances of survival of the offspring. Reproduction is affected by nutrition and management practices. Table number two shows the vaccination of camels (6).

Table 1: Common disease of camels

Disease	Cause	Symptoms	Notes
Trypanosomiasis (Surra)	<i>Trypanosoma evansi</i>	Fever, weakness, weight loss, anemia, reduced productivity	Transmitted by biting flies; fatal if untreated.
Camel Pox	Camel pox virus	Skin lesions, fever, respiratory symptoms	Highly contagious; severe in young camels.
Mastitis	Bacterial (<i>Staphylococcus</i> , <i>Streptococcus</i>)	Swelling, heat, pain in udder, reduced milk production	Affects lactating camels.
Internal Parasites	Nematodes, liver flukes	Weight loss, diarrhea, poor growth	Common in poorly managed environments.
External Parasites	Ticks, mites, lice	Itching, hair loss, skin lesions	Ticks transmit other diseases like anaplasmosis.
Respiratory Diseases	Bacteria (<i>Pasteurella</i> spp.), viruses	Fever, coughing, nasal discharge, labored breathing	Dusty environments increase risk.
Foot and Mouth Disease	FMD virus	Fever, blisters on mouth and feet, lameness	Less common in camels than other livestock.
Brucellosis	<i>Brucella abortus</i> , <i>B. melitensis</i>	Abortion, infertility, reduced milk production	Zoonotic; affects humans too.
Dermatophilosis	<i>Dermatophilus congolensis</i>	Scabby skin lesions	Associated with wet, humid conditions.
Anthrax	<i>Bacillus anthracis</i>	High fever, bleeding from orifices, sudden death	Highly fatal and require immediate reporting.
Nutritional Diseases	Poor diet or deficiencies	Weakness, poor body condition, reduced productivity	Includes ketosis, acidosis, and deficiencies.
Tetanus	<i>Clostridium tetani</i>	Muscle stiffness, spasms	Enters through wounds; preventable with vaccination.
Rabies	Rabies virus	Behavioral changes, salivation, paralysis	Transmitted via bites; fatal once symptoms appear.
Enterotoxemia	<i>Clostridium perfringens</i>	Diarrhea, abdominal pain, sudden death	Particularly affects young camels.

Prevention and control of disease

Good management practice, vaccination, proper nutrition, parasite control, and early detection of diseases in camels prevent and control diseases in these animals. Vaccination is considered one of the most potent means to prevent many infectious diseases in camels. In areas with a history of eruptions, vaccination against camelpox, brucellosis, foot-and-mouth disease and anthrax may be essential. Booster doses are necessary at regular breaks to preserve immunity levels. Parasite control is also important. Camels are vulnerable to internal parasites such as gastrointestinal worms and flukes and outside parasites such as ticks, mites and lice. Deworming with antiparasitic drugs is important. Rotational grazing can decrease the parasite load in the environment. External parasites can be organized with topical insecticides or acaricides. Regular checks should be approved for early detection and treatment of influxes. Hygiene and sanitation are key to preventing the range of diseases. These include cleaning pens, shelters and feeding areas, sterilizing apparatus such as water troughs and feed containers, and proper waste disposal. Routine check-ups and early diagnosis are critical. The observation of camels for signs of illness like fever, lethargy, or abnormal behavior, and seeking veterinary help quickly, aids in the treatment of diseases early. This may help prevent an outbreak and improve recovery results. Some of the ways of minimizing the spread of disease are by restricting access to the farm, the use of protective clothing in handling the animals, disinfecting tools and equipment, preventing contact between wild animals and the domesticated camels to minimize zoonotic diseases. Health monitoring through surveillance and screenings of camel diseases is vital in identifying emerging diseases. Regional cooperation between dromedary farmers and veterinary services helps in effective monitoring of disease outbreaks so that control measures can easily be applied. Properly managed breeding and caving also reduce the risk of reproductive diseases like mastitis and brucellosis. Suitable care during the post-calving period is essential for the proper health of both the dam and the calf. The management of the environment works towards the

prevention of some diseases. Providing shade, sufficient ventilation, and protection from extreme weather conditions reduces stress and the risk of heatstroke or respiratory infections (7).

Conclusion

Camels are remarkable animals that are well adapted to harsh environments, especially deserts, due to their unique physical and behavioral characteristics. Their ability to survive long periods without water, their resistance to extreme temperatures and their ability to store fat in bumps make them invaluable in dry areas. Camels are essential for transport, milk, meat and wool and contribute significantly to the livelihoods of many communities. Effective management practices, including proper feeding, disease prevention and husbandry, ensure camel health and productivity. Their adaptability, both in the wild and in domesticated conditions, highlights their importance for sustaining life in challenging conditions.

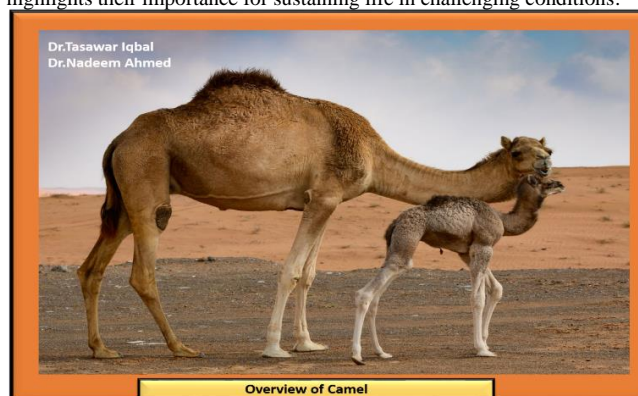


Fig. 1: Overview of camel life

Table 2: Vaccination of camel Disease

Vaccine	Disease Prevented	Administration	Frequency	Region of Use
Camel Pox Vaccine	Camel pox (viral infection)	Intramuscular or subcutaneous injection	Annual or as required	Common in regions with endemic camel pox
Brucellosis Vaccine	Brucellosis (bacterial infection)	Subcutaneous or intramuscular injection	Single dose, booster every year	Common in areas with a history of brucellosis [8, 9]
Foot and Mouth Disease Vaccine	Foot and mouth disease (viral infection)	Intramuscular injection	Annually or as recommended during outbreaks	Regions with frequent FMD outbreaks
Anthrax Vaccine	Anthrax (bacterial infection)	Intramuscular injection	Annual or as needed	Areas where anthrax outbreaks are common
Rabies Vaccine	Rabies (viral infection)	Intramuscular injection	Annual	High-risk areas, particularly in regions with wildlife contact [10]
Pasteurella Vaccine	Pneumonia (bacterial infection)	Intramuscular injection	As needed, typically annually	In areas with respiratory infections in camels
Tetanus Vaccine	Tetanus (bacterial infection)	Intramuscular or subcutaneous injection	Single dose, booster every 1-2 years	Areas where injury or surgery is common
Rift Valley Fever Vaccine	Rift Valley Fever (viral infection)	Subcutaneous or intramuscular injection	Annual or as recommended	In areas affected by Rift Valley Fever [11]

References
References

- [1] Gaouar SBS, Ciani E. An overview of camel biodiversity and genetics. In: *Biology and Life Sciences Forum*. MDPI; 2023. p. 15.
- [2] Alhadrami G, Faye B. Camel. 2022;
- [3] Manjunatha BM, Al-Hosni A, Al-Bulushi S. Effect of advancing the breeding season on reproductive performance of dromedary camels. *Theriogenology*. 2022;179:230–6.
- [4] Gauch M, Mai J, Lin J. The proper care and feeding of CAMELS: How limited training data affects streamflow prediction. *Environ Model Softw*. 2021;135:104926.
- [5] Iqbal T, Ahmed N. BAMBOO EXTRACTS LOADED PLGA NANOPARTICLES FOR THE TREATMENT OF RHEUMATOID ARTHRITIS.
- [6] Faye B, Konuspayeva G, Magnan C. Physiology of Large Camelids: Life Cycle, Adaption to Ecosystems, and Reproduction. In: *Large Camel Farming: A Care-Management Guide from Breeding to Camel Products*. Springer; 2023. p. 31–53.
- [7] Kandeel M, Al-Mubarak AIA. Camel viral diseases: current diagnostic, therapeutic, and preventive strategies. *Front Vet Sci*. 2022;9:915475.
- [8] Qureshi MA, Fatima Z, Muqadas SM, Najaf DE, Husnain M, Moeed HA, Ijaz U. Zoonotic diseases caused by mastitic milk. *Zoonosis, Unique Scientific Publishers, Faisalabad, Pakistan*. 2023;4:557-72.
- [9] Abbas RZ, Muqadas ZS, Qureshi MA, Fatima Z. Bovine brucellosis. *Biological Times*. 2024 Jun 3;6:27-8.
- [10] Qureshi MA, Fatima Z, Muqadas ML, Najaf DE. Rabies; A Potential Human Threat. *Biological Times*. 2023 Mar;2(3):9-10.
- [11] Muqadas AS, Qureshi A, Imdad N, Fatima Z, Khalid A, Ahmad B, Sindhu IA. Rift valley fever. *One Health Triad, Unique Scientific Publishers, Faisalabad, Pakistan*. 2023;3:151-6.