

Spotlight on Agriculture

Ministry of Agriculture, Water and Rural Development • Directorate of Agricultural Research and Training • Private Bag 13184 • Windhoek

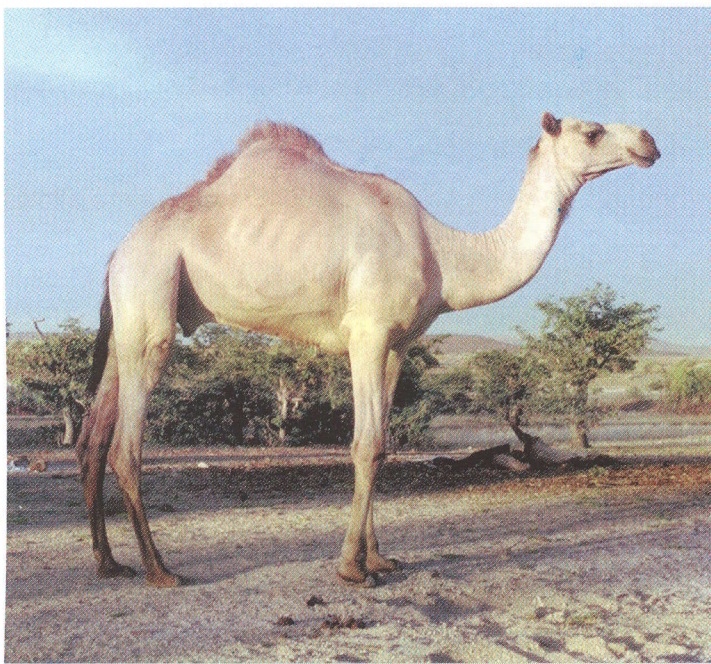
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Why not Camels?

"In a world rapidly running out of food and energy sources the camel must provide at least a partial answer to some of the problems."

RT Wilson, 1984

DISTRIBUTION



The Arabian or one-humped camel (*Camelus dromedarius*; Family: Camelidae), also called the dromedary, occurs in the tropics and tropical-type climates where aridity and heat are two of the principal factors.

In 1993 there were an estimated 1.5 million one-humped camels in the world, occurring in northern Africa, the Near East and west-central Asia. More than 80% of all Arabian camels are found in Africa.

The wild ancestors of the camel lived in the desert fringes of southern Arabia and thus evolved in lands subject to drought. Camels are almost certainly the domestic animal best adapted to the harsh environments and the fluctuating nutritional conditions of the arid and extremely arid zones.

ADAPTATION TO ENVIRONMENT

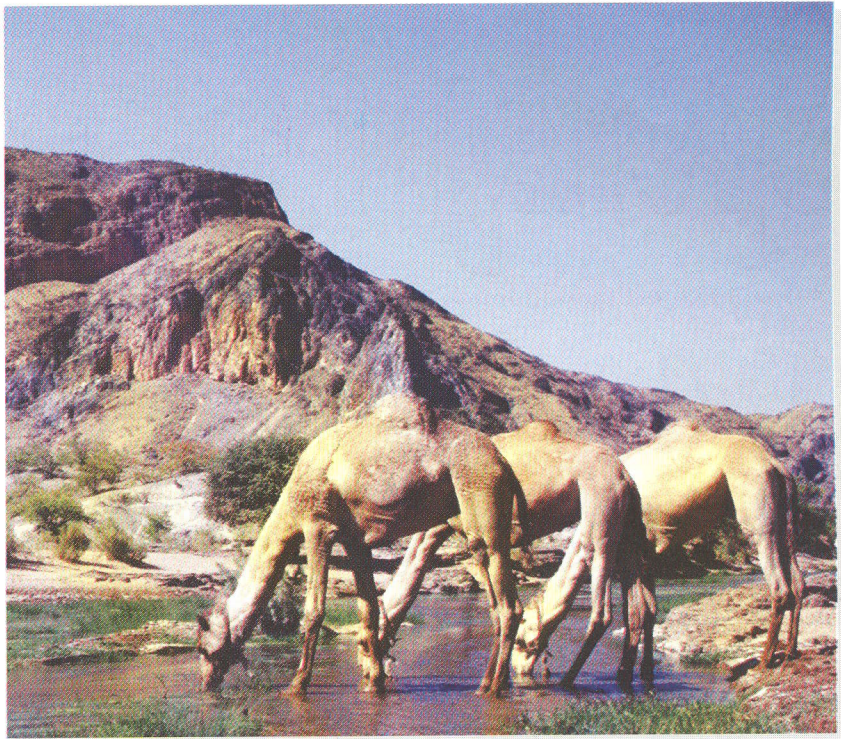
The principal mechanism by which the camel survives in the desert is its ability to conserve body water by means of physiological adaptations. In addition, the camel also has behavioural and anatomical adaptations to desert conditions.

Physiological adaptations

- The camel has the ability to allow its body temperature to fluctuate, up to 8°C (between 34 and 42°C). With heat storage, a part of the heat load does not have to be dissipated immediately during the day by evaporative cooling but is stored until it can be radiated and conducted away at night, when ambient temperatures are cooler, without loss of water.
- Camels have very low respiration rates and therefore low respiratory evaporation.
- The camel is very efficient and effective in reducing faecal and urinary water loss and, in relation to its body weight, the camel also passes very little urine, even when it has free access to water.
- The camel has a lower water turnover rate, and therefore also a lower rate of water consumption, than other livestock species.
- Camels can rehydrate extremely rapidly and are much less susceptible to water intoxication than other livestock species.
- The camel does not sweat continuously and the sweat therefore evaporates directly from the skin, cooling the animal more.
- Camels can drink water with salt concentrations two or three times that which cattle, goats and sheep can.

Behavioural adaptations

- To reduce heat absorption from the earth to its body, the camel settles on the ground early in morning before the ground has warmed, and it tucks both fore and hind limbs beneath it, to reduce contact with the ground.
- To reduce the total area subject to radiation, camels, especially if dehydrated, will sit down facing the sun when there is no shade, gradually shifting position throughout the day to orient to the sun and to keep in line with it as the earth rotates.
- Camels also cluster together in heat, oriented to the sun, to reduce the area exposed to radiation.
- The camel's habit of urinating on its legs does cause some evaporative cooling.



Anatomical adaptations

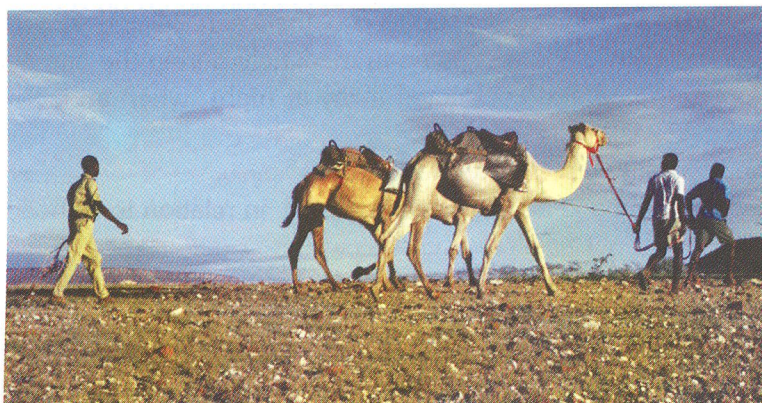
- The camel restricts subcutaneous fat largely to its hump. The lack of subcutaneous fat elsewhere allows rapid dissipation of heat through the skin.
- Heat storage and heat loss in camels is very effective due to their large weight-to-surface ratio.
- The lateral profile of the camel, enlarged by long legs and a hump, presents a large target to be warmed by the low sun in the cool of the morning and the evening. In contrast, the razor-backed shape presents a small target to the overhead sun in the heat of midday.
- The large pad-like feet of the camel reduce ground pressure when walking and allow easy progress over sandy surfaces.
- The massive bone above the eye of the camel, protects the eye from the direct rays of the sun.
- The split upper lip, which is very prehensile and mobile, allows the camel to select the most succulent and nutritious feed.

PRODUCTION AND WORK USES

In most areas camels are multipurpose animals providing various products and sources of work, thus having comparative advantages over other domestic livestock species. Production and work uses of the camel include:

- Milk • Meat • Blood • Hides • Wool • Hair • Transport for humans and goods • Draught and industrial power • Tourism.

CONCLUSION



The camel has always been confined to the most extreme conditions of heat and aridity. The camel is ideally suited to an arid to semi-arid country such as Namibia. Animal husbandry needs to become better adapted to the realities of climate and pasture resource in Namibia, resulting in better utilisation of the available resources. However, interventions should be designed as such that camel and other livestock species complement, rather than substitute, one another.

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