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Deon Furstenburg

Giraffe

Giraffa camelopardalis (Linnaeus, 1758)

Afrikaans	Kameelperd
German	Giraffe
French	Giraf
Swahili	Twiga
isiNdebele	Intudla
isiZulu	Indlulamithi
isiXhosa	Indlulamthi
seSotho	Thuhlo
seTswana	Thutlwa
Shona	Nhutlwa
Shangaan	Nthutlwa
Nama/Damara	!Garo!naib

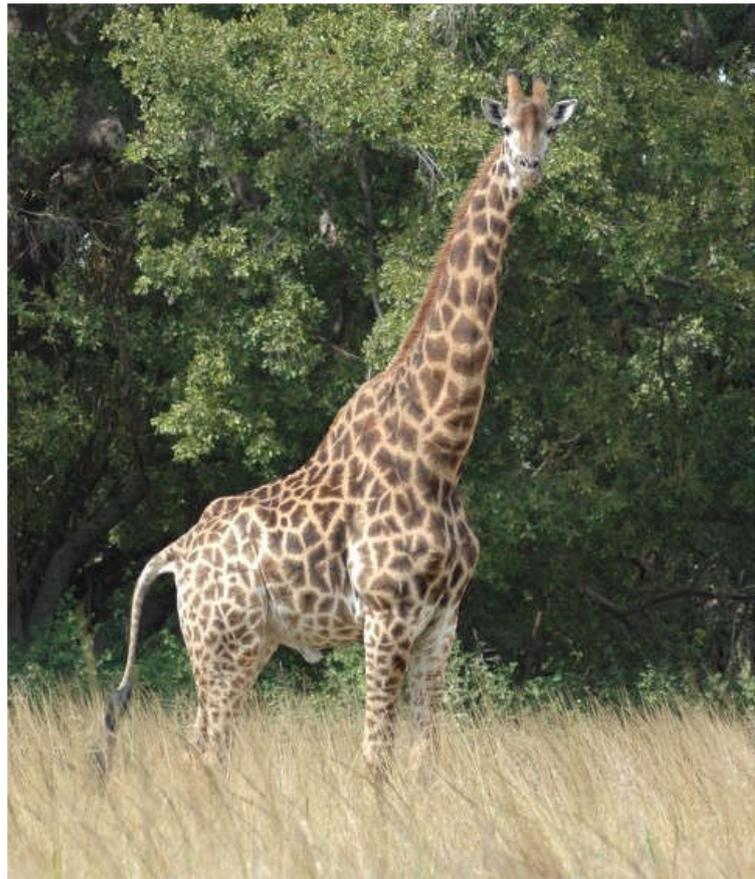
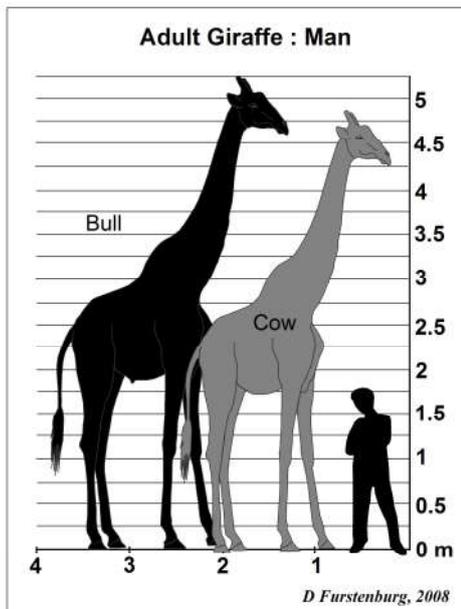


Photo: Johan vd Vyver, adult southern giraffe bull

IUCN Conservation Status:

Lower Risk, conservation dependent (LR/cd).

The majestic grace of the giraffe, the tallest animal on Earth, makes it one of the animals most appreciated by tourists. This megavore has a head height exceeding five metres, three antlers, three blood systems and split hooves. The name giraffe is derived from the Arab word “xirapha” meaning “fast walking”. The species name refers to “*camelo*” after the appearance of the sub-Saharan camel *Camelus bactrianus* and “*pardalis*” the rosette skin pattern of the leopard *Panthera pardus*. The Afrikaans name encompasses both the appearance of the camel and the action of a galloping horse.

Taxonomy	Kingdom:	ANIMALIA
	Phylum:	CORDATA
	Class:	MAMMALIA
	Supercohort:	LAURASIATHERIA
	Cohort:	FERUNGULATA
	Superorder:	CETARTIODACTYLA
	Order:	RUMINANTIA
	Suborder:	PECORA
	Superfamily:	Giraffoidea
	Family:	Giraffidae
	Genus:	<i>Giraffa</i>
	Species:	<i>camelopardalis</i>

Fossilized remains show that the modern giraffe originated in north-eastern Africa in the Miocene 10 million years BP, from the larger pre-ancestor *Samotherium africanum* followed by *Bohlinia* sp. From here it dispersed into southern Eurasia during the Pliocene seven million years BP. The African lineage comprised five species, *Giraffa gracilis*, *G. pygmaea*, *G. stillei*, *G. jumae* and *G. camelopardalis*.

The giraffe has split hooves which places it in the order of the Cetartiodactyla. There are only two related, living genera in this family each with one species, namely the giraffe *Giraffa camelopardalis* and the okapi *Okapia johnstoni* of Zaïre.

There is no sub-speciation in the okapi but the giraffe has nine subspecies, each with a unique colour pattern

- *Giraffa camelopardalis giraffa* the southern giraffe of Zimbabwe, Mozambique and eastern Botswana
- *G.c. angolensis* the Angolan giraffe of Botswana, Namibia and Angola
- *G.c. thornicrofti* Thornicroft's giraffe of the Luangwa Valley in northern Zambia
- *G.c. tippelskirchildi* the Masai giraffe of Tanzania and southern Kenya
- *G.c. rothschildi* Rothschild's giraffe of Uganda and western Kenya

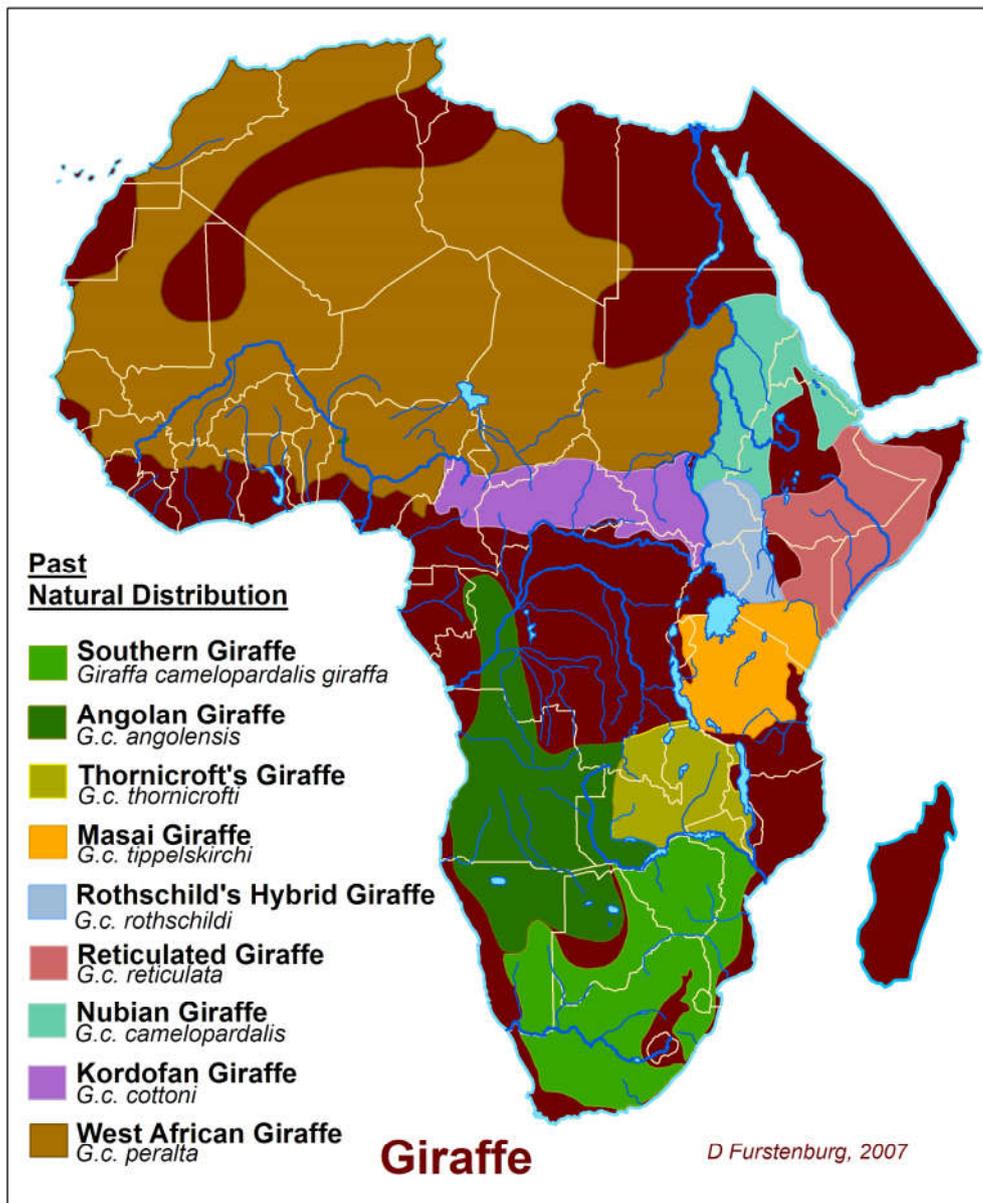
- *G.c. reticulata* the reticulated giraffe of Kenya, southern Ethiopia and eastern Uganda
- *G.c. antiquorum* the kordofan giraffe of Sudan
- *G.c. peralta* the West African giraffe found in an area stretching from Mali to Niger, the Central African Republic, southern Chad and southern Sudan
- *G.c. camelopardalis* the Nubian giraffe from eastern Sudan and Eritrea

The South African giraffe is a hybrid of *G.c. giraffa* and *G.c. angolensis*.

Distribution

Historically, giraffe were found in Morocco and in the savannah and woodland biomes of an area stretching between the Sahel and the course of the Orange River, excluding the tropical rain forests of central and western Africa. Ancient Khoi rock art of giraffe found at Graaff-Reinet and Queenstown in the Eastern Cape caused a controversy, as previous evidence indicated that the distribution of giraffe ended further north in KwaZulu-Natal, in an area just south of the Tugela River basin.

Past rinderpest outbreaks have caused the giraffe's former distribution to shrink by more than a half. More recently, giraffe have been re-introduced to its former habitat, as well as being established in parks and private lands across most habitats of the southern African sub-continent south of the Zambezi River. However, free roaming giraffe are still found in the remote areas of the Kalahari and in the Kaokoveld desert of Namibia. At present, parks in central East Africa are home to 65% of the extant giraffe population.



Description

Adult bulls reach a maximum height of 5.5 m, with a record of 5.88 m and an average body mass of 1 400 kg with a maximum 1 930 kg. Adult cows reach a height of 4.8 m and have an average mass of 970 kg and a maximum 1 180 kg. The shoulder height varies from 2.4-3.5 m in adult bulls and from 2.1-3.0 m in cows. The adult body size is reached at an age of 5-7 years. The first molar teeth appear at three years and the canines at six. A very long tongue of 45 cm is an adaptation for its specialised browsing behaviour. Very old bulls become smelly due to a musk secretion that gives the meat a bad taste.

At 16 mm the giraffe has the thickest skin of all living land animals, the next being the elephant and hippo at 9 mm. Skin colour changes with age from a light yellow-brown at birth, to a cinnamon brown at adulthood and then to either a dark cinnamon brown, a faded

creamy yellow-brown or dark black-brown at post-maturity. Subspecies are identified by regional differences in the pattern and colour of the mosaic blocks.

The immense difference in height between the feet and head of giraffe requires a major blood system adaptation. The heart, pumping at 120/80 mm Hg, cannot cope with the excessive pressure required to push the blood from 1.7 m above the ground to a head height of 4.8-5.5 m. In order to pump blood up to the head, the neck artery *artery jugularis* is muscular and functions autonomically contracting and increasing the blood pressure to 260/160 mm Hg. As the small capillaries in the brain cannot tolerate this increased pressure, a network of intermediate arteries known as a *reté mirabilia* exists at the base of the head. This reduces the high neck pressure to normal before the blood enters the brain. This pressure exchange prevents black-outs when giraffe lower their heads to drink and then pull fully upright when sensing danger. The phenomenon has been studied intensively by NASA, in search of solutions to counteract the anti-gravity experienced by astronauts when entering space. During capture and immobilization operations, extreme caution must be taken to prevent handling a giraffe's head below a height of 0.5 m above its body level. This prevents the neck blood pressure from bursting the *reté mirabilia* and stops blood being forced into the brain.



Southern giraffe



Angolan giraffe



Thornicroft's giraffe



Masai giraffe



Rothschild's giraffe



Reticulated giraffe



Kordofan giraffe



Western giraffe

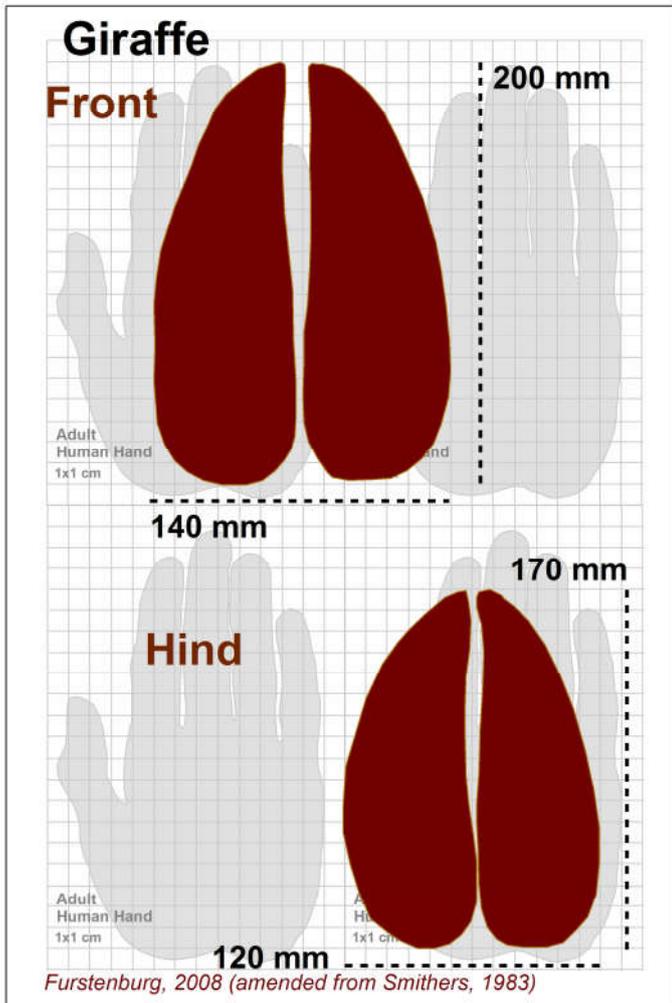


Nubian giraffe

Spoor

The hooves are cloven. The front spoor of 20x14 cm supports the enormous mass of the adult neck and is larger than the hind spoor of 17x12 cm. The hooves are similar to those

of the eland *Tragelaphus oryx* and the buffalo *Syncerus caffer* with blunt, rounded tips and a slightly narrower front than back.



Information table

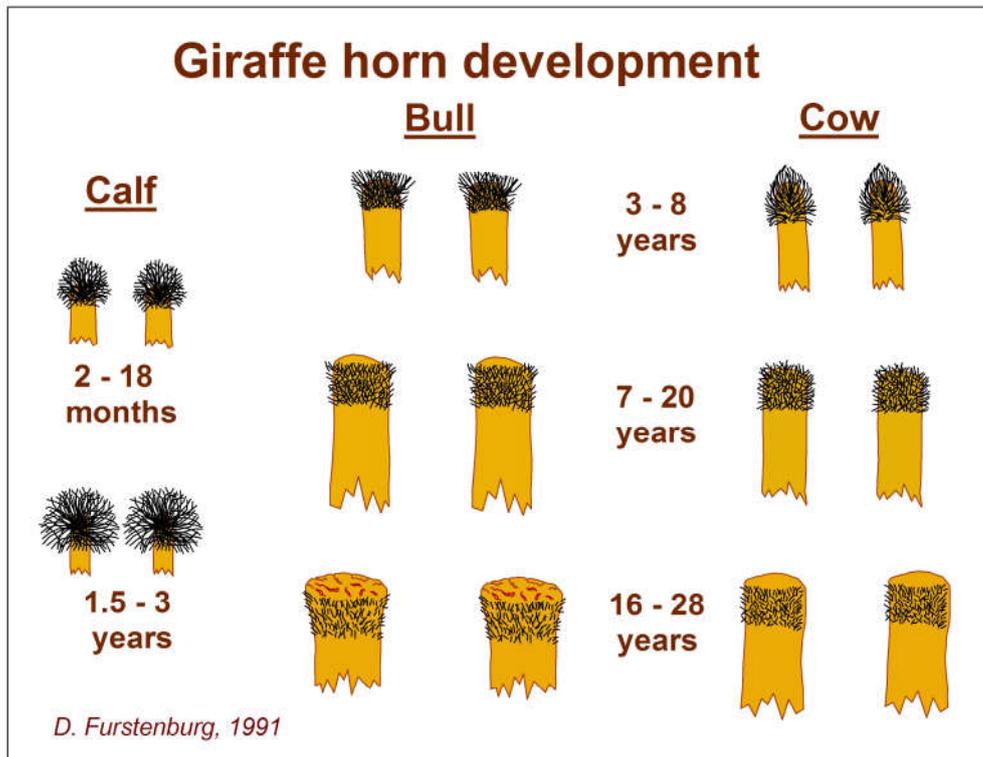
Giraffe information table			
Characteristic		Bull	Cow
Adult body weight	kg	970 – 1 400	700 – 970
Adult head height	m	4,7 – 5,5	4,2 – 4,8
Adult shoulder height	cm	240 – 350	210 – 300
Sexual maturity age	years	3 – 3,5	3,5 – 4
Social maturity age (1st mating)	years	8	4 – 5
Gestation period	months		15
1st Calf born at age	years		5,3 – 6,3
Calving interval	months		18 – 20
Rutting season		Year round	
Calving season			Year round (60% Mar – Jul)

Weaning age	days	240 – 300	
Gender ratio: entire population (natural)		1,2	1
Gender ratio: entire population (production)		1	4
Mating ratio: adults (natural)		1	2 – 4
Mating ratio: adults (production)		1	5 – 6
Calf birth ratio		1,5	1
Maximum lifespan	years	25 – 28	22 – 25
Home range	ha	3 000 – 16 000	2 000 – 7 000
Territory range	ha	None	None
Large stock grazing unit (adult)	LSU	1,6 per animal (1% of diet)	1,3 per animal (1% of diet)
Browsing unit (adult)	BU	4,1 per animal (99% of diet)	3,8 per animal (99% of diet)
Maximum stocking load	80 ha per animal (at 400 mm rain)		
Minimum habitat size required	ha	900	
Annual population growth	7 – 16% (mean 12%)		

Trophy

Official registries do not class giraffe as trophy animals as they lack true keratinous horns. Both males and females have fixed non-seasonal antlers of fully developed bone growing from the frontal-skull plate that are covered with epidermal skin. The horns occasionally break off during a fierce bull fight but, unlike true antlers, do not grow again. A broken horn often remains attached by the skin and hangs down the side of the head. The horns of bulls are generally thicker and have less hair on the tip than cows. Calves are born with fully developed horns with furry hair plumes at the tip. In bulls, the front part of the frontal skull plate thickens with age to form a third horn-like boss; this phenomenon also occurs in eland bulls.

Giraffe trophy records
Rowland Ward (XXVII edition 2006):
Not listed as a trophy animal
Safari Club International S.C.I.:
Not listed as a trophy animal



Habitat requirement

Giraffe inhabit large ranges of dry and semi-arid sub-tropical savannah environments varying from open to closed woodland and dense shrub-thicket. Vegetation communities dominated by *Acacia* trees are preferred but forests are totally avoided. The Kalahari savannah and the rocky deserts of the Richtersveld, Kaokoveld and the Chommas Hochland in Namibia form part of the former distribution of the giraffe.

Giraffe can survive several days without drinking water which allows them to travel long distances in the desert. Short, extremely cold spells with temperatures as low as -9°C can be tolerated but severe mortalities occur if they are prolonged.

Giraffe avoid entering water and will not cross rivers. As a result rivers with permanent water tables act as natural barriers to giraffe movement and their distribution.

Behaviour

When alarmed, giraffe seldom run far but rather move quietly away from the source of danger. They are inquisitive and will only move away for a short distance before stopping to look behind, often returning to investigate the nature of the threat. They can outrun a man riding a horse for up to seven kilometres at a sustained speed of 56 km/hour. When defending her calf, a cow takes a wide-legged stance over it and attacks, stabbing with the

front hooves with a ferocity that can kill an adult lion. If they feel insecure, giraffe will give a series of soft snorts.

Most activity takes place during daylight hours, early evening and moonlit nights. Giraffe have an average roaming distance of 3-6 km/24 hour cycle in savannah bushveld, and up to 23 km in a desert environment. They take short naps of 10-20 minutes, lying flat on their bellies with legs folded underneath and the neck and head held up straight.

On cold winter nights giraffe climb the catenae to warmer altitudes moving away from water courses and frosty marshland plains areas. In conditions of extreme cold such as in snow falls, giraffe leave the area and can break through several fences in the attempt. Smoke from burns and veld fires evoke a hysterical reaction that causes them to flee for long distances.

Feeding & Nutrition

Giraffe are exclusive browsers that utilize leaves, young shoots and twigs from a large variety of trees and shrubs. Dicot forbs account for 1.5% of the dietary intake and grass 0.5%. When available, flowers, pods and fruit are preferred and are an important food resource.

During moist growing seasons, feeding is mostly restricted to deciduous tree and shrub species. During early, dry winter months giraffe survive on less palatable evergreen trees and shrubs along the water courses of smaller drainage lines and, at the end of winter, on unpalatable evergreen trees of riverine thicket associated with larger rivers. In dry winter months up to 15% of the total dietary intake consists of hard roughage such as twig material. This decreases to <5% in a moist summer. Overall, 60-70% of the diet consists of 3-5 preferred plant/browse species and the remaining 30-40% of 25-35 other species.

Giraffe are highly selective of plant species but only partly selective of specific plant parts. Thus they are not concentrate feeders such as the duiker *Sylvicapra grimmia*.

The diet is selected to ensure a continued intake of 14-19% dried matter crude protein throughout the year. Mortalities occur when the crude protein concentration of the diet is <12%. Daily giraffe consumption is 8-12 kg dried matter or 20-30 kg wet plant material per sub-adult, 18 kg dried matter or 45 kg wet matter per adult cow and 19 kg dried matter or 48 kg wet matter per adult bull.

Giraffe feed throughout a 24 hr period; 70% in the daytime and 30% at night. The remaining hours are spent ruminating; during the day they ruminate in the shade of trees. The twigs of non-spinescent plants and plants with hooked thorns are taken sideways between the lips. Leaves are stripped from the twigs by rolling the long tongue around the twig and giving a slight sideways jerk of the head. In contrast, twigs of spinescent plants with straight thorns are not stripped but individual leaf clusters are picked by gently closing the lips

between the spines.

They prefer to browse at 1.8-4.8 m, a height at which they have little competition from other browsers. When veld is heavily stocked with giraffe a browse line appears at a height of 5.6 m. Even with a low stocking density of one giraffe per 500 ha suitable habitat, the shape of the canopy of trees is permanently transformed.

Osteophagia is a well known behaviour of giraffe. When the phosphate and/or calcium content of the diet become insufficient, bones and parts of carcasses are chewed and soil and dirt are licked.

Generally the daily water consumption is 47 litres but giraffe can go without water for several days in dry habitats and deserts but become selective in their choice of diet.

Territory & Home range

Home ranges are large, ranging from 2 000-16 000 ha with considerable overlapping. The home range is not permanent as a giraffe herd will migrate in search of new food resources during an extreme drought. Territorial behaviour does not exist as adult bulls are nomadic and wander between breeding herds.

Aggressive encounters occur between bulls in the vicinity of cows in oestrus. Two opponents take position beside each other with heads facing in the same direction. The heads and necks are pulled far apart and then swung with massive force, hammering the short horns into the flanks of the opponent's body or the head. A knock of this nature can kill an adult eland bull.

Sub-adult bulls tend to display a homosexual, erotic display similar to the fighting of adults but the action lacks force and is a gentle, graceful movement. This behaviour is often mistaken for a fight. Mating behaviour follows a similar pattern to the young bull flirtations.

Social structure

Cows and sub-adults form breeding herds of 4-25 individuals and, although large herds can occur, they are uncommon. A herd of 239 was recorded in the Serengeti and herds of 48 and 68 in the Kruger National Park. The author also recorded two herds of 64 and 72 in the Kruger National Park between 1984 and 1988, the latter splitting into three independent herds after four days. A herd is defined as a group where all individuals keep in direct eye contact with each other and move at the same pace, in the same direction for a simultaneous purpose such as roaming, drinking or avoiding danger. Herds are not stable and constantly change in size and composition. Giraffe lack a fixed family bonding and individuals are exchanged between adjacent herds during social encounters. Herds do not have a hierarchy of dominance. The sporadic forming of mass herds is only temporary and allows an interchange of individuals and the restructuring of breeding herds.

Adult bulls are solitary nomads. They associate with different breeding herds for a short duration, mostly for mating and the testing the oestrus of females.

Sub-adult bulls form small bachelor herds of 2-5 individuals until the age of eight when social maturity is reached and they become adult nomads.

Reproduction

Cows become sexually mature at 3.5-4 years and reach the age of first mating almost simultaneously at 4-5 years. Bulls become sexually mature at 3-3.5 years and socially mature at eight years. In common with the kudu *Tragelaphus strepsiceros*, a single calf is born after a gestation of 15 months. Twins occur occasionally; over a period of three years the author recorded two twin births in 370 giraffe observations in the Kruger National Park. Cows have specific calving localities in which they give birth. Females give birth in a standing position which results in the calf falling 1.5 m and rips the umbilical cord off instantly. The calf stands up within five minutes and hides for 4-5 weeks before joining the herd. During the birth and hiding period the cow remains solitary, roaming within an area three kilometres from her offspring and returning frequently to feed it. There is a period of three to five months between the birth and the next mating, giving a sequential calving interval of 18-20 months.

A giraffe calf has a birth mass of 60-90 kg and a head height of 1.5-1.8 m. It begins browsing two weeks after birth.

Production

The normal giraffe population structure is 55% adults, of which 13-22% are bulls; 23-41% are cows, 38% are sub-adults of both sexes and 7%, calves. The birth ratio of calves is 60% male to 40% female and the calf mortality before 18 months, 55%.

The recommended mating structure for optimal production is one bull of >8 years to 5-6 cows of >4 years. The natural mating ratio of free roaming giraffe however, is one adult bull per 2-4 adult cows. The annual population growth with a natural mating ratio i.e. birth success minus mortality, is 12% at an annual rainfall of 400 mm.

Giraffe can climb over fences up to a height of 1.4 m. They cause severe damage to inner livestock fences by lifting the front legs over the fence and then dragging the hind legs through the wire strains.

Giraffe do not compete with livestock for food resources and may be integrated successfully into livestock systems. Stocking densities vary from one giraffe per 500 ha to one per 60 ha depending on the abundance and density of suitable browse. In the Timbavati nature reserve in the Lowveld of South Africa giraffe mortalities became apparent when a density

of one per 40 ha was reached.

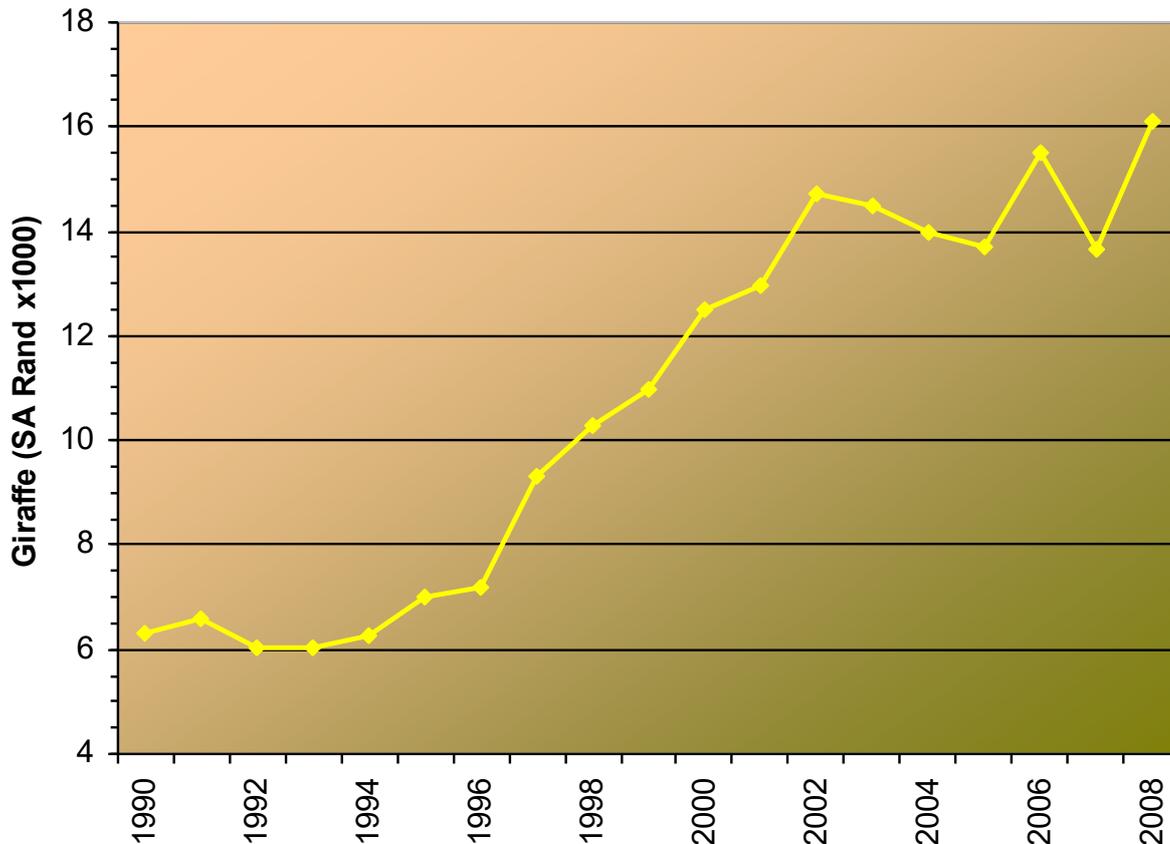
Except for the musky taste of mature bull meat, giraffe meat is generally tender and tasty. Preparation is lengthy as the meat has a coarser grain than that of smaller antelope. The thickness of the hide makes tanning extremely difficult and expensive and the hide must be well skimmed before tanning. Carcasses dress at 55% with an average mass of 770 kg for bulls and 460 kg for cows. The most important value of giraffe lies in its potential for eco-tourism.

Disease

Giraffe are susceptible to anthrax, hartwater and rinderpest. They may be carriers of foot-and-mouth disease but clinical symptoms are not exhibited. A viral infection causes warts on the skin. Although these are not inherently dangerous they may become infected if pecked or ripped open by redbilled oxpeckers *Buphagus erythrorhynchus*. The body build of a giraffe makes grooming difficult and results in heavy tick infestations. Giraffe brush ticks of their bodies by standing over shrubs and scratching their bellies backwards and forwards on the branches.

Trend in mean annual Giraffe auction prices

(Data from: Vleissentraal; T. Eloff, Univ. Potchefstroom; Cloete & Taljaard, Univ. Free State)



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Gallery



Adult cow

Photo: Deon Furstenburg



Adult bull

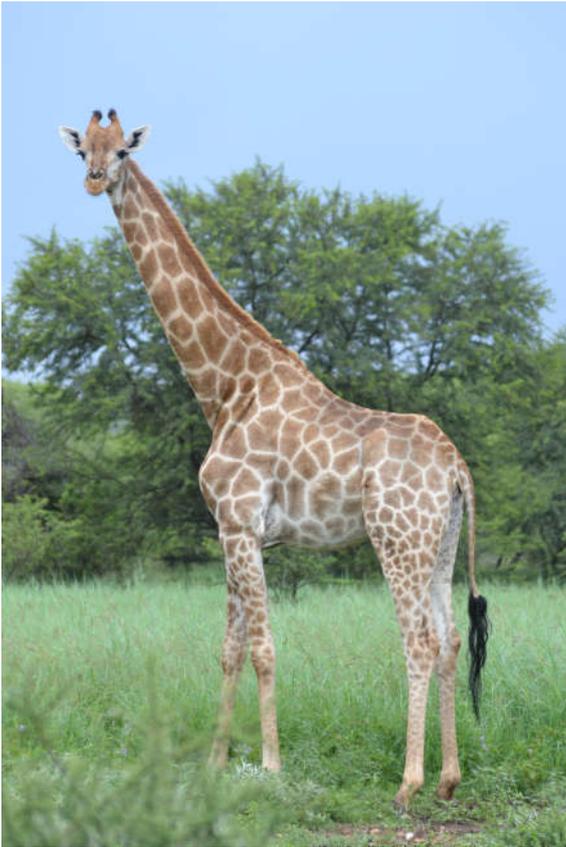


Photo: Deon Furstenburg, Adult southern giraffe

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