



## Queuing males

Most mature males leave their natal clan to join other clans. When a male immigrates into a new clan, he takes the lowest social position in the clan's male hierarchy and only increases in status as immigrants 'ahead of him in the queue' die or leave the clan. An immigrant male must queue for many years to gain the alpha male position. High-ranking males feed at kills before low-ranking males and thus do not need to commute as often.

Female spotted hyaenas exercise a high degree of mate choice. They also mate with several males, and to avoid inbreeding, young females refrain from mating with long-tenured (high-ranking) males. As females mate with immigrant males of all ranks, high-ranking males do not monopolize mating. This may help explain why immigrant males rarely use aggression to 'jump the queue'.

## Early life

Females give birth throughout the year, and cubs are housed together in the clan's communal den. Dens contain several cubs of noticeably different ages. Female spotted hyaenas are renowned for having an erectile elongated clitoris ('pseudopenis') resembling the male penis, through which they urinate, copulate and give birth. The fact that births occur through this narrow 'pseudopenis' probably explains, why litter size (1 or 2, rarely 3 cubs) and cub birth weight (~1.5 kg) are low.



Cubs are born with their eyes open and teeth erupted: traits linked to aggressive contests between newborn siblings to establish their within-litter dominance relationship. This involves one cub using aggression to 'train' its sibling to habitually submit when challenged (trained loser effect). Once its dominance status is established, the dominant sibling uses threats to skew milk intake in its favour. This nutritional advantage provides the dominant sibling with higher growth rates and a better survival to adulthood than its littermate.

Female spotted hyaenas are devoted mums: they produce very nutritious milk containing a high protein and fat content for up to 18 months.

Mothers that regularly commute between their milk-dependent cubs at the communal den and distant migratory herbivores, may be absent for 2 to 9 days at a time and, in a year, may walk a distance of 2800-3600km (i.e. substantially more than a migratory wildebeest!). Most cubs receive little solid food before they are 6 months of age, and solid food is rarely taken to the dens.



When ecological conditions prevent mothers to deliver sufficient milk to their twin litters, the dominant sibling increasingly prevents its subordinate from obtaining milk during nursing bouts. This may result in facultative siblicide, if the subordinate littermate dies of starvation. As female spotted hyaenas only have two functioning teats, triplet litters very rarely survive. In the Serengeti, no case is known.

## Threats & conservation status

The Serengeti National Park protects one of the largest spotted hyaena populations in Africa (~7500 animals). Outside of protected areas throughout Africa however, the species is in decline - mainly because of habitat loss and lethal persecution, such as poisoning. Further human-induced threats are road accidents as well as wire snares set by illegal bushmeat hunters.

## Serengeti Spotted Hyaena Project

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# Spotted Hyaenas

## Findings & Insights

By Serengeti Spotted Hyaena Project





## What are hyaenas?

The carnivorous, once very species-rich, HYAENIDAE evolved about 25-29 million years ago. Today, the family comprises four species, three of which can be found in the Serengeti: the spotted hyaena, the striped hyaena and the insectivorous aardwolf which resembles a miniature striped hyaena. The brown hyaena only occurs in southern Africa. While hyenas morphologically and behaviourally resemble canines (members of the dog family), they actually belong to the category of feliform (cat-like) carnivores and are more closely related to cats and mongooses.

**This leaflet outlines research findings from a long-term project on spotted hyaenas in the Serengeti National Park, produced by scientists from the Leibniz Institute for Zoo & Wildlife Research in Berlin, Germany.**

## Social life

Spotted hyaenas live in fission-fusion societies termed clans. Members of a clan are not constantly together, but rather associate with particular individuals and only unite, when rallied to join communal action against neighbouring clans or lions. Females remain in the clan in which they were born, and clans contain several matrilineal lines. Most breeding males are immigrants from other clans. Hyaenas scattered throughout the clan territory (about 50 km<sup>2</sup>) keep in contact through acoustic and olfactory communication. For example, an individual's 'whoop' calls are acoustically distinct and audible for several kilometres.



Anal gland scent, 'pasted' on grass stalks in a clan's territory, contains up to 252 volatile compounds which provide each animal with a 'clan odour' - that all clan members share - as well as with an individually distinct odour. These odours persist for many weeks and thus help clan members to keep in contact - even if they don't actually meet.

Spotted hyaenas have a complex body language of gestures which are combined with a range of vocalisations to communicate aggression, submission, invitations to play and much else. One well known vocalisation is the 'laugh' or 'giggle' which is an expression of submission or fear. When adult clan members of the same sex meet, they participate in greeting ceremonies in which they use body gestures that signal their respective social status.

## Constantly moving prey

Spotted hyaenas are often viewed as just scavengers and kleptoparasites that 'clean-up' carcasses or steal prey from other predators. In fact, they use both these foraging tactics, but are also skilled and powerful hunters adapted for sustained high speed chases of prey.



Due to intense feeding competition among each other, but also with lions (who often steal their prey), spotted hyaenas have evolved the ability to swiftly ingest food and consume about 25% of their body weight (~ 55 kg) in one meal! Their powerful jaws and dentition allow them to crush and consume even large bones from which their acidic digestion can extract nutrients. This enables spotted hyaenas to consume and digest the remains of carcasses left by predator species lacking such adaptations.

In the Serengeti, the abundance of prey in hyena clan territories is low unless large herds of migratory ungulates are present. If Serengeti spotted hyaenas solely depended on resident prey in their territories, clan sizes would be far smaller than they are. Serengeti clans are larger than expected because they mainly feed on migratory ungulates (wildebeest, zebra and Thompson gazelles). These species however move throughout the year; thus a clan's territory will contain abundant prey only for a limited number of months each year. When migratory herds are absent in their territory, clan members (alone or in small groups) regularly travel large distances in search of areas where large herds are present and they can feed before returning home. These 'commuting trips' can entail round trips of 150 km.



## Female power & social privilege

Females and their offspring socially dominate all immigrant males in a clan. Mothers support their offspring during social interactions with clan members they dominate. This results in their offspring acquiring a social position immediately below that held by their mother in the linear female dominance hierarchy. High-ranking females have priority of access to food in the clan territory, and 'high-born' offspring acquire this privilege from their mother. This way privileges associated with high status are passed on across generations. A similar behavioural 'inheritance' of social privilege (or 'silver spoon effect') occurs in some old world primates and human societies.

Adult females form coalitions with other females in the clan that hold social positions close to them in the hierarchy. When a coalition judges it has a numeric advantage over the coalition above them, violent fights may occur. Such revolutionary coups may cause the top-ranking (alpha) female and her coalition partners to fall in status, and a new female and her coalition partners to take over the highest ranks in the clan hierarchy.



As high-ranking females have privileged access to food resources in the clan territory, they do not need to commute as frequently as low-ranking females and can nurse their cubs more often. As a result, 'high-born' cubs have higher growth rates, are less likely to die from pathogen infections and overall have better survival than less privileged offspring. Thus high-ranking females have a higher reproductive success than those below them in the hierarchy.