The hippopotamus is a megaherbivore and is exceeded in size among land animals only by elephants and some rhinoceros species. The mean adult weight is around 1,480 kg (3,260 lb) for bulls and 1,365 kg (3,009 lb) for cows. Exceptionally large males have been recorded reaching 2,660 kg (5,860 lb).[28] Male hippos appear to continue growing throughout their lives, while females reach maximum weight at around age 25.[29] Hippos measure 2.90 to 5.05 m (9.5 to 16.6 ft) long,[30] including a tail of about 35 to 56 cm (1.15 to 1.84 ft) in length and 1.30 to 1.65 m (4.3 to 5.4 ft) tall at the shoulder,[31][32] with males and females ranging 1.40 to 1.65 m (4.6 to 5.4 ft) and 1.30 to 1.45 m (4.3 to 4.8 ft) tall at the shoulder respectively.[32] The species has a typical head-body length of 3.3–3.45 m (10.8–11.3 ft) and an average standing height of 1.4 m (4.6 ft) at the shoulder.[33]

Hippos have barrel-shaped bodies with short tails and legs, and an hourglass-shaped skull with a long snout.[34][8]:3,19 Their skeletal structures are graviportal, adapted to carrying their enormous weight,[8]:8 and their dense bones and low centre of gravity allows them to sink and move along the bottom of the water.[35] Hippopotamuses have small legs (relative to other megafauna) because the water in which they live reduces the weight burden.[36] The pelvis rests at an angle of 45 degrees.[8]:9 Hippos usually trot to move quickly on land and can gallop at 30 km/h (19 mph) when needed. They are incapable of jumping but can walk up steep banks.[34] Despite their rounded appearance, hippos have little fat.[8]:3

The eyes, ears, and nostrils of hippos are placed high on the roof of their skulls. This allows these organs to remain above the surface while the rest of the body is submerged.[37]:259 The nostrils and ears can close when underwater while nictitating membranes cover the eyes.[8]:4,116 Despite being semiaquatic and having webbed feet, an adult hippo is not a particularly good swimmer, nor can it float. It rarely enters deep water; when it does, the animal moves by bouncing off the bottom. An adult hippo surfaces every four to six minutes, while young need to breathe every two to three minutes.[8]:3–4 The hippopotamus sleeps with both hemispheres of the brain resting, as in all land mammals, and usually sleeps on land or in water with the nostrils exposed. Despite this, it may be capable of sleeping while submerged, intermittently surfacing to breathe without waking. They appear to transition between different phases of sleep more quickly than other mammals.[38]

Characteristic "yawn" of a hippo

The hippo's jaw is powered by huge masseter and digastric muscles which give them large, droopy cheeks.[37]:259 The jaw hinge allows the animal to open its mouth at almost 180°.[8]:17 A folded orbicularis oris muscle allows the hippo to attain an extreme gape without tearing any tissue.[39] On the lower jaw, the incisors and canines grow continuously, the former reaching 40 cm (1 ft 4 in), while the latter can grow to up to 50 cm (1 ft 8 in). The lower canines are sharpened through contact with the smaller upper canines.[34] The canines and incisors are used mainly for combat instead of feeding. Hippos rely on their flattened, horny lips to grasp and pull grasses which are then ground by the molars.[37]:259,263 The hippo is considered to be a pseudoruminant; it has a complex three-chambered stomach, but does not "chew cud".[8]:22

Completely submerged hippo (San Diego Zoo)

Hippo skin is 6 cm (2 in) thick across much of its body with little hair.[34][37]:260 The animal is mostly purplish-grey or blue-black, but brownish-pink on the underside and around the eyes and ears.[37]:260 Their skin secretes a natural, red-coloured sunscreen substance that is sometimes referred to as "blood sweat" but is neither blood nor sweat. This secretion is initially colourless and turns red-orange within minutes, eventually becoming brown. Two highly acidic pigments have been identified in the secretions; one red (hipposudoric acid) and one orange (norhipposudoric acid), which inhibit the growth of disease-causing bacteria and their light-absorption profile peaks in the ultraviolet range, creating a sunscreen effect.[40][41] Regardless of diet, all hippos secrete these pigments so food does not appear to be their source; rather, they may be synthesised from precursors such as the amino acid tyrosine.[41] This natural sunscreen cannot prevent the animal's skin from cracking if it stays out of water too long.[42]

The testes of the males do not fully descend and a scrotum is not present. In addition, the penis retracts into the body when not erect. The genitals of the female hippos are unusual in that the vagina is ridged and the vulval vestibule has two large, protruding diverticula. Both of these have an unknown function.[8]:28–29

A hippo's lifespan is typically 40 to 50 years.[37]:277 Donna the Hippo was one of the oldest living hippos in captivity. She lived at the Mesker Park Zoo in Evansville, Indiana, in the US[43][44] until her death in 2012 at the age of 61.[45] The oldest hippo ever recorded was called Bertha; she had lived in the Manila Zoo in the Philippines since it first opened in 1959. When she died in 2017, her age was estimated to be 65.[46]

A pod at the Saadani National Park

Cows reach sexual maturity at five to six years of age and have a gestation period of eight months.[71] A study of endocrine systems revealed cows may begin puberty at as early as three or four years.[72] Males reach maturity at around 7.5 years. Both conceptions and births are highest during the wet season. Male hippo always have mobile spermatozoa and can breed year-round.[8]:59–61,66 After becoming pregnant, a female hippo will typically not begin ovulation again for 17 months.[72]

Preserved hippopotamus fetus

Hippos mate in the water, with the cow remaining under the surface,[8]:63 her head emerging periodically to draw breath. Cows give birth in seclusion and return within 10 to 14 days. Calves are born on land or shallow water[34] weighing on average 50 kg (110 lb) and at an average length of around 127 cm (4.17 ft). The female lies on her side when nursing, which can occur underwater or on land. The young are carried on their mothers' backs in deep water.[8]:4,64

Mother hippos are very protective of their young, not allowing others to get too close.[34] One cow was recorded protecting a calf's carcass after it had died.[73] Calves may be temporarily kept in nurseries, guarded by one or more adults, and will play amongst themselves.[34] Like many other large mammals, hippos are described as K-strategists, in this case typically producing just one large, well-developed infant every couple of years (rather than many small, poorly developed young several times per year, as is common among small mammals such as rodents).[72][67] Calves no longer need to suckle when they are a year old.[8]:64

Interspecies interactions

A hippopotamus and Nile crocodile side by side in Kruger National Park

Hippos coexist alongside a variety of large predators in their habitats. Nile crocodiles, lions, and spotted hyenas are known to prey on young hippos.[34] Beyond these, adult hippos are not usually preyed upon by other animals due to their aggression and size. Cases where large lion prides have successfully preyed on adult hippos have been reported, but it is generally rare.[74] Lions occasionally prey on adults at Gorongosa National Park and calves are sometimes taken at Virunga.[75] Crocodiles are frequent targets of hippo aggression, probably because they often inhabit the same riparian habitats; crocodiles may be either aggressively displaced or killed by hippos.[76] In turn, very large Nile crocodiles have been observed preying occasionally on calves, "half-grown" hippos, and possibly also adult female hippos. Groups of crocodiles have also been observed finishing off still-living male hippos that were previously injured in mating battles with other males.[77][78]

Hippos occasionally visit cleaning stations in order to be cleaned of parasites by certain species of fishes. They signal their readiness for this service by opening their mouths wide. This is an example of mutualism, in which the hippo benefits from the cleaning while the fish receive food.[79] Hippo defecation creates allochthonous deposits of organic matter along the river beds. These deposits have an unclear ecological function.[62] A 2015 study concluded hippo dung provides nutrients from terrestrial material for fish and aquatic invertebrates,[80] while a 2018 study found that their dung can be toxic to aquatic life in large quantities, due to absorption of dissolved oxygen in water bodies.[81][82]

The parasitic monogenean flatworm Oculotrema hippopotami infests hippopotamus eyes, mainly the nictitating membrane. It is the only monogenean species (which normally live on fish) documented to live on a mammal.[83]