Wildlife Vets Namibia August 2022 Edition 53

NEWSLETTER AUGUST

In this newsletter:

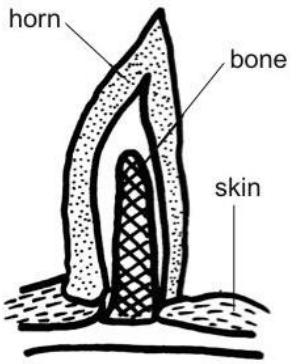
Dear clients,

The year flies by, August is already almost finished again. In our latest newsletter you can read how spiral horns grow, how animals see the world differently then we humans do, and we talk about rabies vaccination for kudu and eland. If you would like to have your kudu/eland population vaccinated, please contact us for more information. The more farmers join, the cheaper it will be for all!

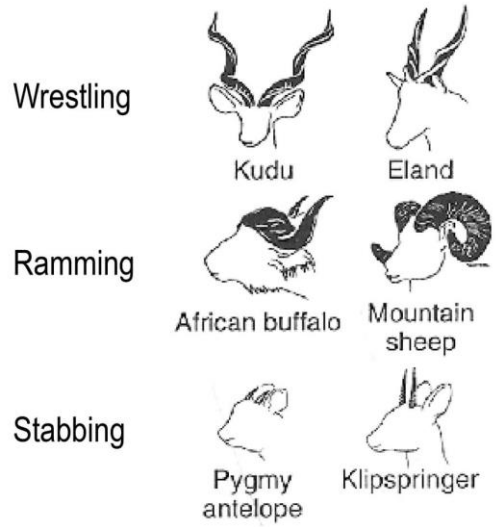
Kind regards, the Wildlife Vets Namibia team

SPIRALLING HORNS

A horn is a pointy permanent projection that grows on the head of our African ungulates (hooved mammals). On the inside of the horn is a core of live bone, which is covered by a sheath of keratin and other proteins. Horns grow throughout an animal's life (but are also worn off).



Anatomy of a horn
© Ruth Lawson



Different horn shapes have different fighting styles. © CSDT

Different species have different horn shapes, and researchers found that different fighting styles are associated with different horn shapes: short horns are used to stab the opponent, while long horns are more used for wrestling and ramming.

A special group of antelopes, called *Tragelaphini*, or the spiral-horned antelopes, have an unusual set of horns – like corkscrews! Amongst the spiral horned antelopes are eland, kudu, nyala, bushbuck, sitatunga and bongo.

This spiral shape in the horns is due to growth pulses. Sometimes the horn material grows fast and thin, and other times it grows slowly but thick. This change in growth puts the spiralling in the horn. Genes play an important role in the spiralling growth.

The spirals help the bulls to lock the horns when they are fighting. In bulls the horns are usually thicker, making them able to withstand more force. In those species where the females do have horns, their horns are usually thinner, which make them better for defensive behaviour, such as stabbing.

For more information about (broken) horns, read our November 2021 newsletter here.

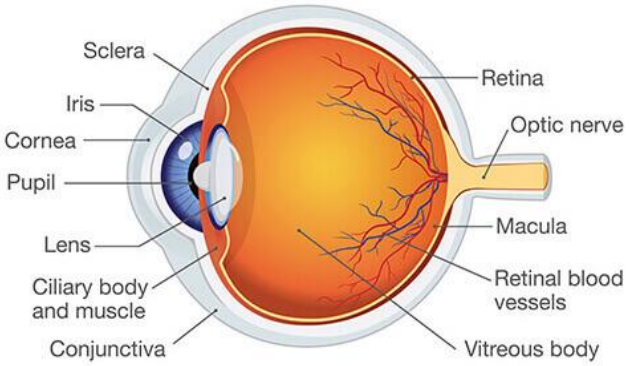
Kudu bull jumping around after offloading.
© M. Bijsterbosch

Impressive eland bull which is immobilized
© M. Bijsterbosch

WHAT A COLOURFUL WORLD?

We humans live in a colourful world. But most animals don't experience the world (and all its colours) as we do. How is this possible? To understand how we and other species experience the world through our eyes, we first need to explain a bit how the eye works.

The eye is a sensory organ, which reacts to light and allows us to use visual information. The *retina* is a thin, light-sensitive layer of tissue that is in the back of the eye. The retina has special cells, called *photoreceptors*. These cells receive light from the lens, and convert this into signals that are sent to the brain. The brain then processes these signals into visual images. There are two types of photoreceptors, called *rods* and *cones*.



Anatomy of the human eye © The medical eye

So how do humans see colours? It is a bit of a difficult and technical story, but I will try to explain. In humans, the cone cells are responsible for seeing colours. We have three types of cones (blue, green and red), and each is sensitive to a particular wavelength of light. Having these three types, makes a human a *trichromatic* species. When light gets into the eye, the cones are stimulated in a different way. All this information is sent to the brain, which interprets the info, and makes the final (colourful) image.

The number and sensitivity of cones, as well as the visual processing of the brain differs between species. Unlike humans, most mammals are *dichromatic*, they only have two cone types (e.g., blue and green). Dogs for example, have two cones that are specialized in picking up yellow and blue to UV-light. This means that dogs cannot see as many colours as we do.

The colour perspective of a human (left) and a dog (right) © University of Queensland

Bees for example are trichromatic, having blue and green cones, and an ultraviolet (UV)-sensitive receptor, allowing them to see UV light. Most birds, fish and some insects are *tetrachromatic*, having four or sometimes even more types of cone cells.

The perspective of a human (left) and a bee (right) © University of Queensland

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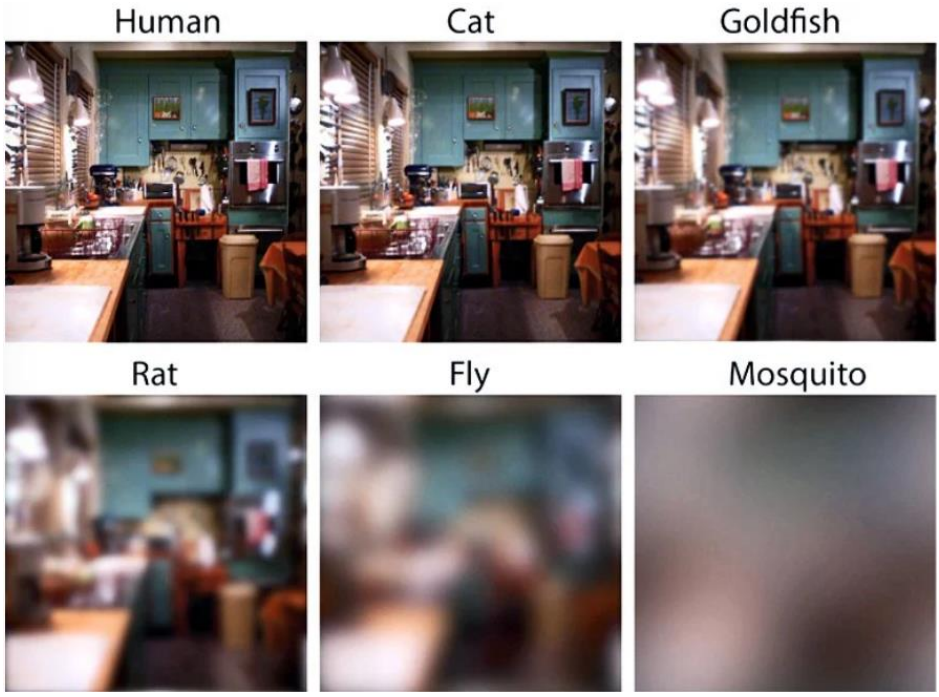
Humans don't see colours well in low light, this is because our cones perform best in relatively bright light. The other photoreceptors cells, called rods, help us to see in dim light. However, our rods only have a single light sensitive pigment, so at night we only see shades of grey. Geckos, as a nocturnal species for example, have very good colour vision at night. Their eyes have evolved to be up to 350 times more sensitive to colours than human eyes in the dark.

On the left a photo of how humans see in low light, on the right a photo of how geckos see in low light. © Lisa Hendry

Besides colours, another difference is the ability to distinguish shapes and details of objects. This is called *Visual Acuity (VA)*.

Many species see the world in less detail than we humans do. In recent years, scientists analysed the visual systems of 600 species, and created a model to show what the world looks like through the eyes of that species. The scientists quantify visual acuity in cycles per degree.

Again this is quite technical, but the cycle per degree is basically how many pairs of black and white parallel lines a species can distinguish within one degree of field of vision before it turns into a smear of grey. The scientists estimate the visual acuity based on the eye's anatomy (spacing and density of the light sensitive structures in the eye) and behavioural tests.



Visual acuity (or sharpness) of different species © Eleanor Caves

For example, humans can see 60 cycles per degree. Many insects can only see one cycle per degree, whereas Australia's wedge-tailed eagle can see nearly 140 cycles per degree. This is why this bird can spot a rabbit from hundreds of meters up in the air (this likely also applies to other birds of prey).

For more information, read the publication here, or visit the website Empirical Imaging.

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RABIES VACCINATION FOR KUDU & ELAND

The leaves are slowly bur surely falling off the trees. This is the time of the year we start looking at vaccinating kudus and eland again against rabies.

Rabies is known as a disease with a low morbidity (affecting few animals in a population) but high mortality (100% amongst infected animals). The Namibian rabies situation is unique in that the disease spreads from kudu to kudu (and eland to eland) and reaches epidemic proportions with devastating effects in these species. Nobody knows exactly how rabies amongst kudus start, but it probably starts with a kudu being bitten by a rabid animal. The spreading of the disease amongst kudus has likely got to do with a higher species susceptibility and its social behaviour. Communal grooming and group feeding from the same bushes are common. As kudus browse on thorn bushes, they have many small cuts around the mouth and lips. These are ideal ports of infection, and are close to the salivary glands and brain (where the virus rapidly replicates), making the spread of the disease even quicker.

When we look at auction and trophy hunting prices, kudus are valuable animals that are worth it to be looked after. From a trophy hunting perspective, the kudu bull is a wanted animal, but also matures slowly (only after about 8 + years a bull reaches trophy hunting standards). A decline in the kudu population therefore poses a long-term threat to a farmer's income.

The most effective way of protecting kudus and eland against rabies is to dart vaccinate from the helicopter. We always strive for the highest possible percentage of the population covered by the vaccine. The time needed for this depends on the farm, the kudu/eland population and bush density. The more farms that join in on such a vaccination trip, the cheaper the costs will be for all.

The vaccine that we use is a dead vaccine, meaning it can't cause a disease... But, it can also not cure infected animals! It is advised to vaccinate before an outbreak hits a farm (vaccinate prophylactically). Emergency vaccinations during an outbreak will usually stop an outbreak within 10-14 days following vaccination, but animals that have been infected will die, even after vaccination.

Click here to watch our YouTube video showing how the rabies darting process works.

Feel free to contact us for more information. If you are interested in vaccinating your population, make sure you ask other farms in your proximity as well. The more that join, the cheaper the costs for all.

On our website we have three articles about rabies in kudu and eland, feel free to download these:

- Rabies in kudu and eland #1: Implications to the game industry
- Rabies in kudu and eland #2: Herd immunity in rabies and COVID-19
- Rabies in kudu and eland #3: How vaccination leads to immunity

Kudu bull that died of rabies. Often carcasses are found near water. Infected animals cannot swallow anymore, and start salivating (drooling) a lot. They want to drink, but can't, and rapidly loose condition due to dehydration and starvation. Dying of rabies is a terrible death...

© U. Tubbesing

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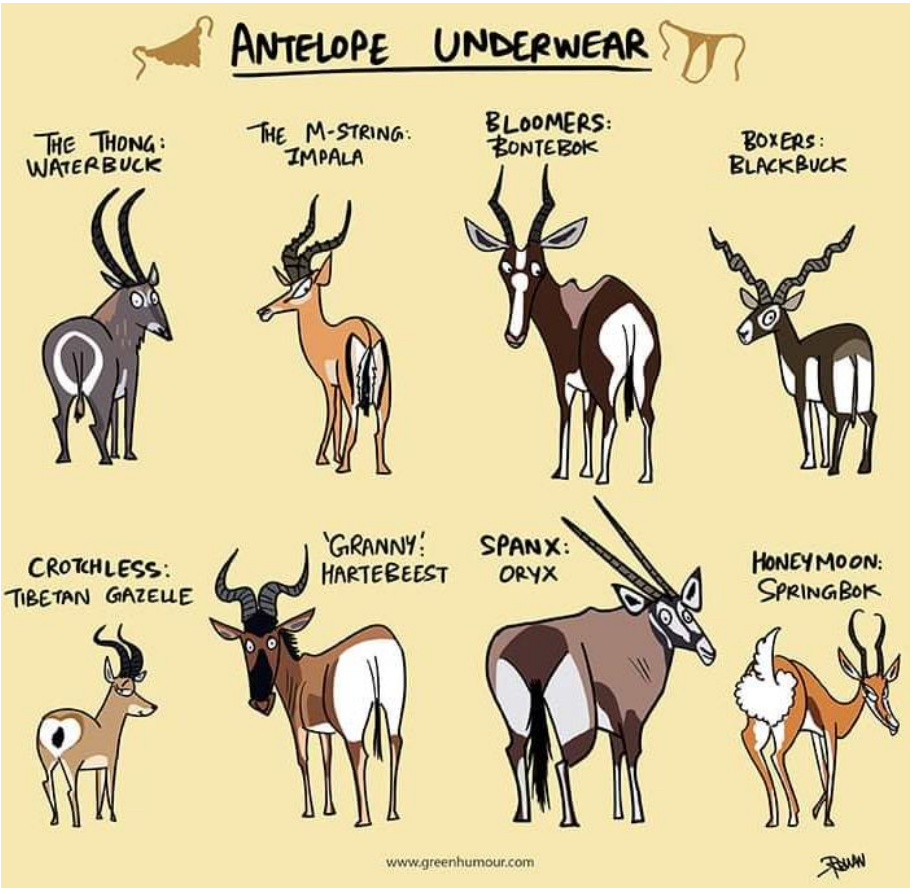

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