

NEWSLETTER JUNE

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Dear clients,

The days and nights are getting colder... Winter is here! We hope you enjoy reading this newsletter with a warm cup of coffee or tea ☺. In this newsletter you can read about the interesting pangolin tongue, pica behaviour (eating of non-nutritional substances) and animals' responses to cold spells, and what you can do to minimize losses due to the cold.

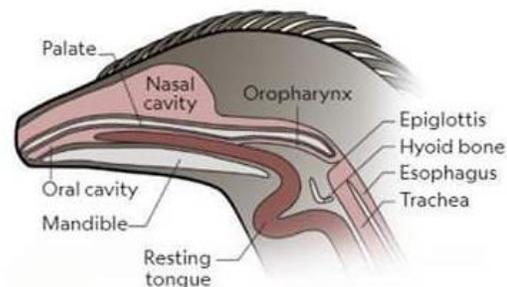
Warm regards, Ulf and Mariska

POWER OF THE PANGOLIN TONGUE

Last month we told you about the interesting features of the chameleons' tongue... But we have another animal in Namibia with a tongue that is just as interesting... the pangolin! Pangolins don't have teeth. They use their extremely long and sticky tongue to get ants and termites out of their nests.

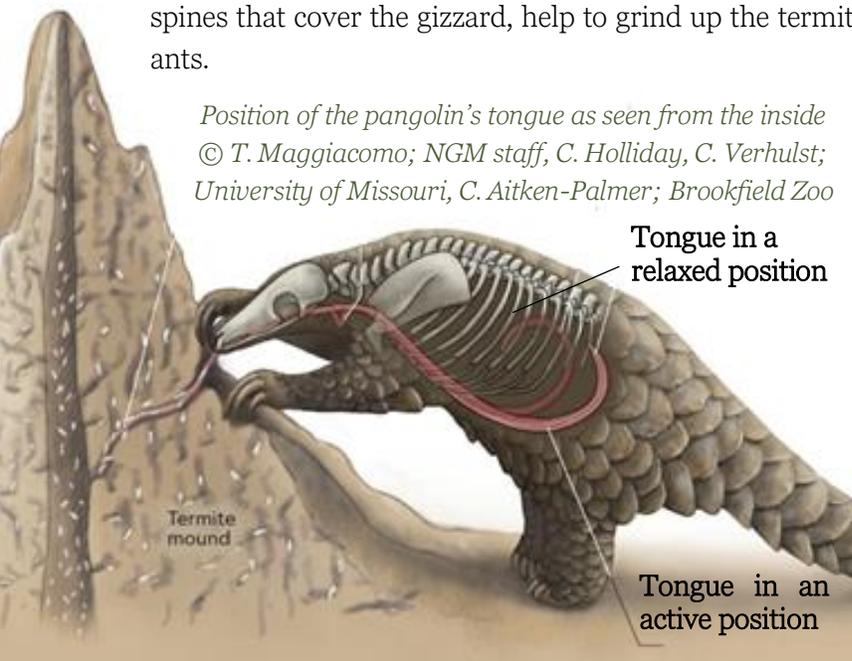
Large pangolins can extend their tongue by as much as 40cm! This long and muscular tongue is perfectly designed to reach far inside termite mounds and ant nests. Interestingly, the root of a pangolin's tongue has its attachments close to the pelvis and last pair of ribs. In the relaxed state, a portion of the tongue is folded within the neck, with the rest coils inwards along the abdominal wall towards the kidneys.

During foraging, the saliva coated tongue is extended by muscle force and straightens out. Pangolin saliva is very sticky, causing their prey to stick to the long tongue. As they forage, they also ingest small stones. These stones enter their stomach, which is similar to a gizzard in birds. The stones, together with keratinous spines that cover the gizzard, help to grind up the termites and ants.



Cross section of the pangolin's head © T. Maggiacomo; NGM staff, C. Holliday, C. Verhulst; University of Missouri, C. Aitken-Palmer; Brookfield Zoo

Position of the pangolin's tongue as seen from the inside © T. Maggiacomo; NGM staff, C. Holliday, C. Verhulst; University of Missouri, C. Aitken-Palmer; Brookfield Zoo



This pangolin was confiscated by MEFT and brought to NARREC. As the pangolin was underweight and dehydrated, it was brought to Rhino Park Veterinary Clinic to be tube-fed. The narrow mouth and throat makes this quite challenging. When the pangolin is back to strength, it will be released back in the wild. For more information about pangolins, have a look at the [NARREC website](#) or check the [First Responders Manual](#)

PICA – A CASE OF A BONE-EATING GIRAFFE

In April we were called out by a concerned game farmer about one of his giraffes. She was acting strange with her mouth; her tongue was sticking out, she was drooling and swaying and turning with her head.



We immobilized the giraffe and examined her mouth carefully. We found that her mouth was full of sharp bones! She chewed on a bit more than she could handle... Parts of a skull and vertebrae pieces were stuck in her mouth, and the sharp edges caused severe injuries to her tongue and inside of her cheeks. Due to all the bones, she was unable to eat or drink properly. The bone pieces were removed, and supportive treatment was given. The giraffe recovered well :)



The giraffe's mouth was severely injured on the inside, and the tongue badly cut. On the right you see all the bone pieces that we took out. The lighter is for size-reference purposes. © M. Bijsterbosch

This “abnormal” behaviour of eating bones is not uncommon, especially in giraffes, and is called *osteopaghy* (= bone feeding). You might be more familiar with the overall term *pica*, which is the consumption of non-nutritional substances. In this short article we tell you more about the different forms of pica, why animals do it, and what you can do to prevent it.

What is pica?

Pica behaviour is the consumption of substances that are not considered to be food. There are several forms of pica observed in animals (and humans), the most well-known are:

- 🐾 Bones Osteophagia
- 🐾 Soil Geophagia
- 🐾 Faeces Coprophagia
- 🐾 Stones Lithophagia
- 🐾 Hair, fur Trichophagia

From left to right; *Chacma baboon eating soil* - © [P. Pebsworth](#), *African wild dog eating dung* - © [Lion Sands](#), *giraffe eating from a wildebeest carcass* - © [C.J. Kendall](#)



For more info on what influences feeding behaviour, read '[Change, the driver of feeding behaviour in \(wild\) animals](#)'

Why do animals eat weird stuff?

Let's start with a simple example... What is the first thing you do when you come home after working hard in the scorching sun? You go to the fridge and grab a cold water or beer. Why? You have an urge for it, your body tells you what you need; a big glass of cold fluids to drop down your temperature and to replenish the fluids you lost while sweating. Animals behave in the same way, they choose the food that meets their needs.

Animals eating bones, such as the giraffe described above, likely have a deficiency of phosphorus or calcium. They supplement their dietary deficiency by sucking, chewing and often ingesting bones. Some scientist believe that ruminants cannot effectively digest the bones, and therefore are unable to extract sufficient phosphorus or calcium for normal physiologic functioning. However, based on research done in cattle, we know that heifers receiving a phosphate deficient diet actively searched and ingested old weathered bones, while those with sufficient phosphorus levels avoided bones.

Thus, in most cases where animals eat something "strange", there is some method in their madness, usually suggesting some dietary deficiency. Some interesting examples of animals displaying pica behaviour:

- 🐾 Chimpanzees in Uganda eat soil which is rich of kaolinite clay (which is high in aluminium), to help their digestion and detoxification of plant material with high levels of tannins.
- 🐾 Many rodents, such as rabbits and hares, eat their own soft faeces (a special type of poo called cecotropes). This behaviour is called *autocoprophagy*. This poo provides them with additional proteins and vitamins as well as much needed intestinal microflora. Similar behaviour is often seen in esp. young rhino calves.
- 🐾 Yellow-chevroned parakeets in Brazil build their nests in abandoned termite mounds, and eat bits and pieces from these mounds. The termite mound soil contains a lot more organic matter and macronutrients (e.g. phosphorus, potassium and calcium), but less micronutrients (e.g. iron, zinc and copper) than ground soil. Nesting parakeets require more macronutrients, and therefore eat the termite mound soil.

What can you do to prevent pica?

Although animals will know what is best for them, it is not optimal that your game or livestock eats bones. They might be at risk of contracting botulism (lamsiekte), which is caused by the bacteria *Clostridium botulinum*. These bacteria grow in rotting animal tissues and plant material such as decaying grass, hay and grain. When the animal ingests these bacteria, they get seriously ill and might die within 6-72 hours. Another risk is that bones get stuck in the mouth, like the giraffe case.

You can help animals to overcome their deficiencies by providing special licks. Since different regions of the country have different soil composition (especially concerning various minerals), it is advisable to follow the recommendations made by animal nutritionists. Their recommendations are based on scientific knowledge of both soil, water and forage analysis in various parts of the country. These professionals (e.g. at Feedmaster/ Voermeester) have compiled specific commercial licks suitable for specific regions and seasons.

In next month's newsletter we will go deeper into the topic of minerals

Licks and rabies?

Some farmers believe that putting out licks increases the risk of spreading rabies. Since the virus is very liable (once outside a host cell it quickly loses its ability to affect other animals, a process that is accelerated by both the high osmotic activity of salt and the effects of sunlight) it is highly unlikely that the virus could be spread through a lick. Rabies is typically transmitted via fresh saliva from an infected animal. The best-known mode of transmission is via bite wounds. Browsers like kudu and eland, however, are gregarious animals that often have small wounds in the mouth and on the tongue from eating thorny bushes. Once an animal in a herd becomes infected, the disease is easily spread via saliva contamination of browse and through grooming behaviour.

ANIMALS AND COLD SPELLS

Some welcome winter with open arms, others already long to summer ... But fact is, winter is upon us! We already had the first cold spell, and it likely won't be the last. Temperatures of -9 have been recorded. While most of us have the opportunity to warm ourselves by a heater or blanket, animals don't have that luxury. How do they deal with Namibia's winter months?

Like humans, warm-blooded animals (mammals) must maintain a certain internal body temperature. A cold spell can cause death and injury to livestock and wildlife. If an animal's core body temperature drops below 35°C, they can die of hypothermia. Exposure of body extremities (ears, tail and distal limbs) to temperatures below zero can result in frost bite lesions. Most species have developed different behaviours and adaptations to handle the cold, some examples:

- 🐾 Sleep and hibernate. Some species go into a deep sleep, and slow down their heart- and breathing rate; *Hibernation*. Their body cools down, and they don't need food or water for a while as their metabolism has decreased. In Namibia, the Southern African hedgehog goes into hibernation. Some mouse and bird species only go into a 'deep-sleep' phase for a few hours or days when it's extremely cold. This is called *Torpor*.
- 🐾 Migration. Especially birds migrate to warmer areas before the cold winter months are coming.
- 🐾 Minimising exposure to cold winds. In severe cold and windy spells animals are classically observed sheltering in densely bushed areas which serve as wind shelters.
- 🐾 Physiological changes:
 - Growing thicker fur
 - Building fat reserves
 - Raising hairs on the body to trap heat, or fluff up feathers

Few of the African antelope species have the ability to build up significant (protective) subcutaneous fat reserves. In addition, most are pregnant during our dry, cold winter months. This puts additional nutritional strain on the animals. Some species, such as kudu, nyala and warthogs are more sensitive to cold than others. We thus often see mortalities in these species (not so much warthog because they shelter in relatively warm ground boroughs) whilst frost bite and the dropping off of ear tips in sable and roan is not uncommon.

THE FOLLOWING ARE A FEW MANAGEMENT TOOLS THAT MAY HELP MINIMISE STOCK LOSSES

Minimise the effects of wind chill – the lowering of body temperature due to wind or lower temperatures – by:

1. Limiting radical debushing – keep sufficient shelter

We have said it before, do NOT debush too radically. Bushes and trees provide cover and shelter against the elements; winds, cold, sun etc. Many game species hide their offspring for the first few days of life in dense bush. Browsers, especially the cold sensitive species such as kudu and nyala, are negatively affected by the reduced availability of browse as well as the lack of shelter. Many farmers try to literally eradicate the much-maligned blackthorn (Swarthaak) *Acacia mellifera* – now called *Vachellia mellifera*. We would like to caution against such a radical approach since it is usually the first bush to start greening, flowering and producing pods following winter and thus providing essential food for browsers like kudu.



Blackthorn or Swarthaak © [D. Becking](#)

For game ranches we recommend structured debushing, in the pattern of a cheetah or zebra skin. Create open grass plains (the yellow part), interspersed with 1- 5 ha sized patches of denser bush (the black spots), where the animals can find cover from the elements and hide.



2. Creating (artificial) shelter areas

If you suspect a cold front, and you notice your game or livestock does not have much hiding places, it is advisable to create shelter areas. You can create walls with branches, or with straw bales for example. This is more applicable for livestock, however from experience we know that for example nyalas use and appreciate straw bale shelters as well.



Shelter with grass bales © [Living my dream life on the farm](#)



Another type shelter with grass bales © [Dr. S. John Martin](#)



Hedge shelter © [BBC Gardeners' World Magazine](#)

3. Concentrating animals in sheltered spaces

Try concentrating animals into sheltered spaces so that proximity to other animals provides some form of shelter and heat. Take for example the penguins in the Antarctica, who huddle up against each other against the cold. This is of course more applicable to livestock and not so much for game.

4. Transporting animals during winter

When you need to transport wildlife or livestock, be very much aware of the outside temperature and the ‘*Wind Chill Factor*’. On the right you see a Wind Chill Chart, which shows by which temperatures frostbite might occur. For example; if it is 5°C outside, and you are driving 60 km/h, the wind chill will feel as -2°. When an animal is wet, it will feel even colder. If it is too cold, rather transport the animals another day or time when its warmer.

Please note, the wind chill factor also applies under cold windy (esp. wet) conditions when animals are not transported. Animals kept in an unsheltered area at 5°C exposed to a prevailing wind of 15 km/h actually experience a temperature of 2°C. No wonder animals died like flies in November 2019!

Buy animals from areas similar to yours

When buying game, especially exotic species best adapted to sub tropic or tropic regions (nyala, lechwe, bushbuck etc.), ideally source these from game ranches where they have been exposed to cold temperatures for a few generations (e.g. nyala sourced from the Freestate area vs those sourced from Natal). This gives some guarantee of the animals being more cold-adapted thus hopefully reducing your losses in a harsh winter.

Preparing for a cold spell

With modern weather prediction models, we receive fairly accurate information and advance warnings of pending cold spells. This enables the farmer to take a couple of steps to prevent or minimise stock losses. These include the following:

Try to maintain animals in the best condition possible: Animals in poor body condition start utilising their fat reserves as a source of energy. We all know that fat also has an important insulation function. Animals in poor condition thus not only have minimal body reserves, they also have no physical protection against the cold.

WIND CHILL TEMPERATURE INDEX Frostbite Times are for Exposed Facial Skin												
Air Temperature (°C)												
Wind Speed (km/h)	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70
30	0	-6	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
35	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
50	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76
55	-2	-8	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

FROSTBITE GUIDE

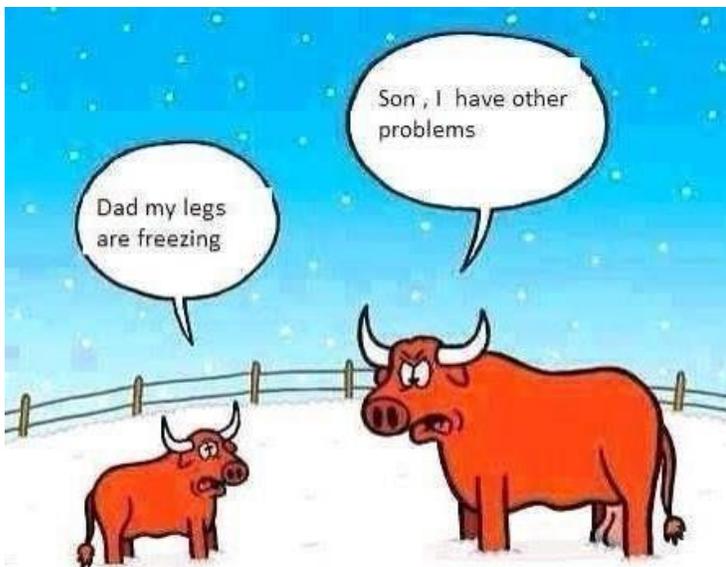
Increasing risk of frostbite for most people in 10 to 30 minutes of exposure
High risk for most people in 5 to 10 minutes of exposure
High risk for most people in 2 to 5 minutes of exposure
High risk for most people in 2 minutes of exposure or less

In case of a severe cold spell such animals will utilise the last energy reserves to generate body heat and are very likely to succumb to the cold. The cold spell associated with the first rains following the 2019 drought comes to mind – most farmers reported massive stock losses even though temperatures hardly approached 0°C.

If you are aware of severe cold coming in, consider giving your animals a late afternoon meal of good quality roughage. You are not just supplying the animals with food, roughage fermentation **by rumen micro-organisms** results in substantial heat production. This “passive” heat from fermentation does NOT require any work from the animal – thus near zero energy consumption.

POST-MORTEM EXAMINATION KITS

During the development of the Post-Mortem course, we had the idea to create Post-Mortem (PM) kits, which anybody can use in the field when they encounter a dead animal. This kit would include everything you would need to do a proper PM, from for example knives, microscope slides, collection jars to gloves. Sadly, at the moment we are unable to get the kits together due to delivery problems of certain items, and we won't start selling these kits anytime soon. Our apologies, especially to those who were interested. Hopefully when the whole COVID-crisis is behind us, we can start sourcing the products again needed for the kits.



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