A SUMMARY OF

Cheetah Research carried out at The AfriCat Foundation since 1997

Introduction

Over the years, the annual health examinations of the captive and rehabilitated cheetahs at The AfriCat Foundation, gave invited specialist veterinarians and researchers the opportunity to conduct research and various aspects of animal health, particularly those relating to the health of large carnivores in captivity.

Few research programs have been more productive than the cheetah project at the AfriCat Foundation. Thus far, twenty peer-reviewed scientific articles and a book chapter have been published from this work and we expect that quite a few more will be added in the next few years. The research also contributed towards the completion of four PhD and six masters-level degrees. What started just as an annual health examination event for the animals, later became an opportunity for veterinarians, researchers and students to dig deep into various aspects of cheetah physiology, anaesthesia and health.

Even though the data collection came to an end in 2018, the foundations laid by this work have led to several new projects on cheetahs elsewhere.
The impact of this research will no doubt benefit both the conservation of wild cheetahs as well as the health and welfare of individuals in captivity around the world. (Dr Gerhard Steenkamp - 2021)

Ocular Abnormalities of Cheetahs Examined at AfriCat

PhD study – Dr Gary Bauer GA, BVc

Over the past years a number of cheetahs in Namibia have been examined ophthalmologically. Equipment used during this examination included a slit lamp biomicroscope, indirect and direct ophthalmoscope, Schiotz tonometer, fluorescein stain and gonioscopy lens. The animals were anaesthetised for the annual health checks at AfriCat on Okonjima in Namibia, or were examined at the time of presentation for blindness.

A high incidence of ocular trauma ranging from mild scarring of the lids and/or cornea, through to mature cataracts, severe endophthalmitis and phthisis bulbi was found.

It is theorised that this is as a result of the cheetah being forced to hunt in bush-encroached areas – a habitat not ideally suited to the hunting methods of the cheetah. Blindness or severe visual impairment spells death for a wild cheetah, and could thus impact greatly on the sustainability of the wild cheetah population of Namibia.

In 1997, four cheetahs were presented for ocular examination and assessment of visual status as these animals were presumed to be blind. Two were adult animals found in the wild in poor physical health and on the brink of death (one old male of unknown age, and 1one adult female, also of unknown age, with three six-week-old cubs at foot), while the other two were young animals approximately one year old that had been born in captivity and hand raised. The two young animals were found to have bilateral mature cataracts with no signs of any other ocular defects. These cataracts were assumed to be either of congenital or nutritional origin.

The adult animals were found to have severe signs of ocular trauma, including lid and nictitans scars, penetrating scar tracts of the cornea, severe synechiation and mature cataracts.

In the female, foreign bodies were found in the cornea of one eye (two thorn tips), with the presence of
severe uveitis in this eye. These animals, following appropriate care and treatment, all underwent successful cataract extraction surgery by phacoemulsification lentectomy technique. These findings prompted an investigation into the cause of the cataracts in adult wild-caught animals to try to ascertain whether the ocular trauma was secondary to the visual deficits present as a result of the cataracts.

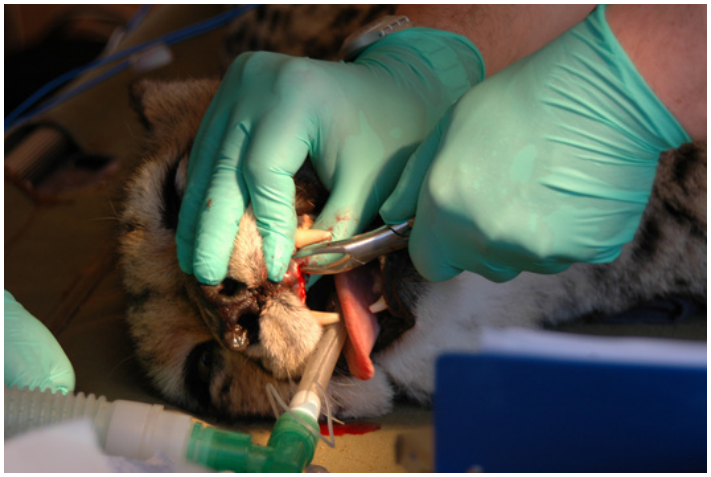
Dr Gary Bauer GA, BVc

How Hot is a Hunting Cheetah?

MSc study – Robyn S. Hetem; Brenda A. de Witt

Cheetah are the fastest terrestrial mammals. During a hunt, cheetah metabolism and heat production increases by more than fifty-fold. Treadmill studies (Taylor and Rowntree 1973) conclude that neither evaporative nor non-evaporative heat loss increase during a run, so all metabolic heat is stored.

If cheetah indeed do use this heat-storage strategy, the duration of a sprint (and hence hunting success) would be determined by the amount of heat the cheetah can store without thermal compromise. We measured body temperature and activity every 5 min, using biologging, in six free-living cheetah of the AfriCat Foundation on Okonjima in Namibia. We tested whether free-living cheetah employed heat storage during hunts, and whether hunts were thermally limited.



2003-2018

I (Gerhard) was invited by Prof. Henk Bertschinger to join the annual cheetah health examinations that were taking place annually. This was due to the fact that I have already worked on cheetah at the Ann van Dyk Cheetah Centre and there were some concerns regarding the dental health of the cheetahs at AfriCat. For the first few years, I joined the health examinations early in the year but then returned later in the year to perform dental surgery on individuals identified at the annual health examinations. Dental treatments notoriously takes a while and could not be done in the limited time available during the health examinations. Initially Dr. Mark Jago assisted me, but later Adrian Tordiffe accompanied me to perform the immobilisations and general anaesthesia.

Dental and Oral Pathology in Cheetahs

Several reports existed at the time where the lack of chewing in captive cheetah and the origin from Namibia were blamed for dental disease in captive organisations especially in the USA, this is referred to as Focal Palatine Erosions (FPE)(Fagan 2014; Fitch & Fagan 1982). The annual visits to this population of cheetahs was an ideal opportunity to test some of the hypotheses in existence at the time regarding oral and dental health and became a large component of my (Gerhard) future PhD (Steenkamp 2017).

The most common abnormality found in the cheetahs was the excessive abrasion of the teeth. It was very common to find pulp exposure associated with this abrasion and this had welfare considerations for the individuals (Steenkamp, Boy, van Staden & Bester 2018). Apart from dealing with the dental disease, it was also important to understand the cause of this. For the first time we were also able to clearly describe all the different areas of the mouth where there were inflamed lesions associated with the palate. The original description of FPE was inflamed areas palatal (towards the inside) of the maxillary 4th premolar teeth.

The inflammation is present in the palatal indentations made by the crowns of the mandibular molar teeth. In cheetahs these indentation are much larger than in lions or leopards. Through work done at AfriCat and also at the Ann van Dyk Cheetah Centre, we were able to show the indentations were not only associated with the mandibular molar teeth, but commonly also with the crowns of the other two premolar teeth present.

In fact, when compared to lions and leopards, cheetah had larger mandibular premolar and molar teeth, relative to the mandibular height. The original anatomical description was published both as a peer reviewed paper as well as a section on the anatomy of cheetah in a book (Steenkamp, Boy, van Staden & Bester 2016; Meachen, Schmidt-Küntzel, Haefele, Steenkamp, Robinson, Randau, et al. 2018).
From our studies it was clear that sand was responsible for the abrasion of the teeth at AfriCat cheetahs. Feeding usually happened on an individual basis with a large piece of meat.

The animals were not used to eating from a bowl and hence carried the meat and dropped it onto the sand before they started consuming it. Old conveyor belts were introduced into the holding camps where the animals were fed. This changed the behaviour with the cheetah lying down on the conveyor belts and consuming the food there. This greatly reduced the sand contamination of the food as it was easier to keep conveyor belts sand free.

"In fact, when compared to lions and leopards, cheetah had larger mandibular premolar and molar teeth, relative to the mandibular height."

It became evident that any of these indentations could trap food/dirt/grass seeds etc. and become inflamed. In order to further clarify the presence of the inflamed indentations in the cheetah we also looked at the development of cheetahs over a period of 25 months. Since the original description of FPE was made only on the palatal indentations the mandibular molar made, the development and eruption of this molar tooth was described in 5 cheetahs in South Africa. It was clear that the lack of chewing in these individuals made no difference to the eruption of the molar teeth and subsequent stability once erupted.

This study found no evidence to support the previous assumption that the lack of chewing in captivity was the cause of an abnormal eruption of the molar tooth (Steenkamp, Schmidt, van Staden & Bester 2019). In fact, due to the over (super) eruption of the mandibular molar teeth which was blamed before, shortening of the molar tooth (odontoplasty) was advocated. During the 13 years of us tending to these cheetahs at AfriCat we described FPE as a misnomer in the literature, since the lesions referred to were not erosive but indeed ulceration and sometimes even with perforation through the palatine bone into the nasal passages. These lesions were also not restricted to the larger palatal indentations associated with the mandibular molar teeth, but could occur at any indentation opposing mandibular premolar or molar teeth. In order to assess these lesions a new clinical scoring system was introduced in the literature which we followed. We therefore introduced the term focal palatitis (FP) to the literature to better describe the pathology seen at these indentations.

Moreover we also showed that by using conservative wound care, we could reduce the inflammation at these indentations and even close the perforations present, without shortening any teeth (Steenkamp, Boy, van Staden & Bester 2021).

We discovered a new papilloma associated with small white nodules from the ventral surfaces of the tongue of several cheetahs at AfriCat and one from South Africa (Brettschneider, Boy, Oosthuisen, Dalton, Tordiffe, Steenkamp G 2015) This virus has been sequenced and the paper is currently under review for publication. We will be proposing the name of this virus as “Acinonyx jubatus papillomavirus type 1.” (AjPV-1). The virus does not cause any disease in the host and also does not affect them negatively at all.

Some of the skulls collected from cheetah that were euthanized was also used in a separate study on the establishment of biomarkers for low levels of vitamin A (hypovitaminosis A). The metabolism of vitamin A (Vit. A) is not well described in cats and there is currently no blood test to accurately determine these levels. As an initial step age determination of cheetahs were done using skull metrics for the basis of this. Skull radiographs of 162 known aged cheetahs in captivity were evaluated and all the various measurements that can be obtained via radiography was evaluated.

His study concluded that multiple stepwise regression analysis revealed the status of closure of the coronal suture, the maximum length of the frontal sinus, the condylobasal-, hard palate, and facial length are most significantly correlated with age. He further elaborates and says with the width of the canine pulp it may help in age determination of cheetahs (Schmidt, Steenkamp, Failing , Caldwell & Kirberger 2019).

This work was essential in order to utilize skull measurements for age determination of wild cheetah. His further work evaluated cranial thickness in wild and captive cheetahs, with several captive cheetahs suffering from Vit A deficiency. There is a significant thickening of the cranial bones in cheetahs suffering from Vit. A deficiencies (Schmidt, Steenkamp, Failing , Caldwell & Kirberger 2021). The significance of this work is based on the fact that many cheetah in captivity suffers from hypovitaminosis A which often goes undetected. This work is the first to identify some measurable characteristic that may show if a cheetah is affected by low levels of Vit. A.

MSc study – Jose Carlos Almansa Ruiz 2012

While working on the cheetahs Dr. Jose Carlos Almansa Ruiz (MSc student) worked on the microbiota we find in the necrotic pulps of canine teeth in cheetah (Almansa Ruiz 2012). It was interesting to see the high number of aerobes still cultured from these necrotic pulps and up to 6 different microbes were isolated from a specific root canal.

Aminoglycoside antibiotics showed the greatest efficacy against the bacteria, however caution needs to be used when selecting these drugs as the side effects may preclude their use *in vivo* (Almansa Ruiz, Bosman,& Steenkamp 2016).

Dr. Jose Carlos Almansa Ruiz

Captive Cheetah Health and Metabolism

Captive cheetahs around the world are known to suffer from a high incidence of unusual non-infectious diseases. These include lymphoplasmacytic gastritis and renal glomerulosclerosis which affect more than 90% of individuals to some degree. Other relatively common abnormalities include veno-occlusive disease, splenic myelolipomas and various forms of renal pathology. Even though we have been aware of these diseases since the 1980s, very little progress had been made in understanding the factors that contribute to these disease processes in cheetahs. Epidemiologically, these diseases appear to be caused by husbandry factors related to nutrition, psychological stress and/or metabolism. The large population of both captive cheetahs at the AfriCat Foundation and the free-ranging cheetahs on the Okonjima Nature Reserve offered a fairly unique opportunity to study both captive and free-ranging cheetah metabolism and health.

The annual health examinations conducted at AfriCat offered the ideal research opportunity to collect samples and monitor changes in the health of each individual over time. In 2013, we initiated an umbrella project entitled: “The long-term health monitoring and immune-competence of captive cheetahs (Acinonyx jubatus) and other felids at AfriCat in Namibia”. The project continued until 2018. Over that six year period several smaller projects were initiated as more information was collected about the animals. Several other veterinarians, students and researchers were brought in to investigate various aspects of cheetah health.

Cheetah Serum Biochemistry

MSc study – Gavin Hudson-Lamb 2016

Dr Gavin Hudson-Lamb completed his MSc in 2016 with a project entitled: Reference intervals for selected serum biochemistry analytes in cheetahs (Acinonyx jubatus). The study was based on samples collected from 30 AfriCat cheetahs and 36 wild cheetahs from elsewhere in northern and central Namibia. Reference intervals were determined for serum sodium, potassium, magnesium, chloride, urea and creatinine. This study was the first to establish reference intervals for serum biochemistry analytes in cheetahs according to international guidelines. The study was published in the Journal of the South African Veterinary Association in 2016 (Hudson-Lamb, Schoeman, Hooijberg, Heinrich, & Tordiffe 2016).

Metabolomic Analysis of Cheetah Serum and Urine

PhD study – Adrian Tordiffe 2013 to 2017

This study was initiated in order to gain a better understanding of cheetah metabolism.

Using gas chromatography-mass spectrometry, 339 different organic acids were annotated and quantified in the urine of 58 captive and free-ranging cheetahs from the AfriCat foundation. This was the first metabolomics study in any large felid species and one of only a few in felids in general.

Phenolic compounds, thought to be produced by the anaerobic intestinal fermentation of aromatic amino acids, as well as their corresponding glycine conjugates, were present in high concentrations in the urine of the captive cheetahs. This was interesting because the required detoxification of these phenolic compounds through glycine conjugation could potentially result in the chronic depletion of both glycine and sequestration of Coenzyme A, with associated negative metabolic consequences.

Concentrations of these phenolic compounds correlated negatively with the end-stage metabolites of dopamine and catecholamines, providing a potential mechanism for significant neuroendocrine dysregulation. Potential mechanisms by which dopamine depletion may play a central role in the pathophysiology of both gastric and renal disease in cheetahs were discussed in the thesis.

This work was published in the Journal of Chromatography B in 2017 with the title: Gas chromatography-mass spectrometry profiles of urinary organic acids in healthy captive cheetahs (Acinonyx jubatus) (Adrian Stephen Wolferstan Tordiffe, van Reenen, Reyers, & Mienie 2017).

Using gas chromatography-mass spectrometry as well as liquid chromatography-tandem mass spectrometry I also established serum and urine amino acid profiles in captive cheetahs. Although the serum concentrations of most of the amino acids in cheetahs were comparable to those in published data for domestic cats, the serum arginine and ornithine concentrations were substantially higher. Both urinary glycine and proline-hydroxyproline concentrations decreased significantly with age.

None of the serum or urine amino acid concentrations differed significantly between males and females. This study provided some foundational information on the serum and urine amino acid profiles of healthy captive cheetahs. It was published in the Journal of Comparative Clinical Pathology in 2019 with the title: Serum and urine amino acid profiles of captive cheetahs (Acinonyx jubatus) (A.S.W. Tordiffe & Mienie 2019).

The serum fatty acid and acylcarnitine profiles of 38 captive cheetahs from the AfriCat Foundation and 44 free-ranging cheetahs from across northern Namibia were evaluated through the use of gas chromatography-mass spectrometry and liquid chromatography-tandem mass spectrometry. The profiles obtained from the free-ranging animals provide a unique, healthy control group for comparison. Significant differences were noted for most of the fatty acid and acylcarnitine concentrations between these two populations, indicating dramatic differences in the dietary fat intake, composition and/or metabolism of these nutrients.

Most of the serum polyunsaturated fatty acid and mono-unsaturated fatty acid concentrations were significantly lower in the free-ranging cheetahs, compared to the captive animals, suggesting that the fatty acids in the wild cheetah diet are largely saturated. Fatty acids not only provide a valuable source of energy, but also perform other vital functions in the body, including hormone production, cellular signaling and the provision of structural components of biological membranes. The altered serum fatty acids could thus have a dramatic impact on health and, since their concentrations are largely influenced by diet. This work was published in PLoS One in 2016 with the title: Comparative Serum Fatty Acid Profiles of Captive and Free-Ranging Cheetahs (Acinonyx jubatus) in Namibia (Tordiffe, Wachter, Heinrich, Reyers, & Mienie 2016).

Through this unique approach, I established new baseline data for a large range of serum and urine metabolites in cheetahs. The results raised many questions and provide valuable new hypotheses into the potential mechanisms of metabolic disorders in captive cheetahs. Many of our current projects on cheetahs flow from this work at AfriCat.

My PhD was awarded in 2017 and my thesis entitled: “The metabolic profiling of cheetahs (Acinonyx jubatus): A systems biology approach to understanding the chronic diseases they suffer in captivity”, is available at https://repository.nwu.ac.za/handle/10394/31734

Prof. Dr.Adrian Tordiffe and
Dr Diethardt Rodenwoldt

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MSc study – Dean Herbig 2020-2022

Serum and urine samples collected from the cheetahs at AfriCat between 2015 and 2018 were used in an MSc study. Dean analysed both the urine and serum of 85 cheetahs where gastric biopsies had been collected and scored for the level of gastritis over that period.

Using nuclear magnetic resonance spectroscopy he identified several metabolites that were either raised or reduced in cheetahs with severe gastritis. Many of these metabolites are either produced or metabolized by gut bacteria and this suggests that the maldigestion and malabsorption of nutrients, leads to intestinal dysbiosis in gastritis cases. Some of these metabolites could serve as biomarkers of the disease, thus making it easier to diagnose and treat in the future.

Transabdominal ultrasound

During the annual health examinations in 2015, 2016 and 2017, all the cheetahs were evaluated using transabdominal ultrasound by diagnostic imaging specialist Prof. Robert Kirberger.
We examined the feasibility of using transabdominal adrenal gland ultrasonography in the anaesthetised cheetahs to firstly, determined normal adrenal measurements and secondly, determine if these measurements could potentially be used as a reliable indicator of chronic stress and/or adrenal function in cheetahs. When corrected for body size, female cheetahs had significantly longer and greater left adrenal corticomedullary ratios than males. The adrenal measurements did not correlate with left renal length, body size measurements, or the size of the cheetah's enclosure. We found that adrenal ultrasonography could be used in the evaluation of stress induced adrenomegally, especially in combination with other techniques such as non-invasive fecal glucocorticoid analyses. This study was published in the journal Zoo Biology (Kirberger & Tordiffe 2016).

Prof Robert Kirberger

Non-invasive blood pressure measurements in cheetahs using a high-definition ocillometric device.

MSc study – Emma Sant-Cassia 2014

Blood pressure measurements provide important insights into the health of conscious and anesthetized cheetahs. This is of particular interest in cheetahs (Acinonyx jubatus), that are known to suffer from chronic diseases that may be associated with hypertension and which often require immobilization for transport or veterinary treatment. Invasive blood pressure methods, using an intra-arterial catheters, are considered the gold standard but are not practical in many settings.

Consequently, it was important to evaluate the use of noninvasive methods in this species. We used high-definition oscillometry (HDO) with the inflation cuff applied to the tail of anaesthetized cheetahs and readings with those obtained simultaneously to direct measurements obtained via catheterization of the femoral or dorsal pedal artery in eight anesthetised AfriCat cheetahs during nine anesthetic events.

When compared to criteria defined by the American College of Veterinary Internal Medicine for validation of blood pressure devices our results were favorable, but a limited sample size prevented formal validation of the device. The result of this study were published in the Journal of Zoo and Wildlife Medicine (Sant Cassia, Boswood, & Tordiffe 2015).

In 2015, we repeated the study with a larger group of cheetahs and also compared the HDO readings from the tail with those measured when the cuff was applied to a leg of the cheetahs. When used on the tail base of cheetahs, the HDO met the ACVIM validation criteria for a non-invasive device with fairly accurate readings.

The research manuscript from this study is currently being reviewed by the journal Veterinary Anaesthesia and Analgesia and will hopefully be published soon.

Cheetah immobilization and anaesthesia

The annual health examinations and dental procedures provided an ideal opportunity to study the effects of various sedative and anaesthtetic drugs on cheetahs. Back in 2006, Dr Mark Jago and Prof. Frik Stegmann evaluated three different drug combinations used for the immobilization of cheetahs at AfriCat.

They compared medetomidine or midazolam in combination with ketamine or tiletamine/zolazepam in 28 animals. They noted rather severe hypertension in all the cheetahs regardless of the drug combination used and also recognized the need for supplementary oxygen as most of the cheetahs became hypoxic when breathing just air (Stegmann & Jago 2006).

Dr Emma Sanr Cassia; Dr Henk Bertschinger; Prof Dr Adrian Tordiffe; Dr Gerhard Steenkamp and Tammy Hoth-Hanssen

They then compared a combination of ketamine and medetomidine with tiletamine-zolazepam and medetomidine in seven cheetahs from AfriCat in a cross-over study design. Both combinations provided acceptable immobilization for field use, but once again hypertension and mild to moderate hypoxia were noted regardless of the drug combination. The manuscript for this study was accepted by the Journal of the South African Veterinary Association and will be published early in 2022.

Prof Gareth Zeiller; Dr Henk Bertschinger

Additional manuscripts that have recently been submitted for review include:

- Medetomidine-ketamine total intravenous infusion for maintenance of anesthesia in tiletamine-zolazepam-medetomidine immobilized cheetahs (Acinonyx jubatus) - submitted to the Journal of Zoo and Wildlife Medicine in January 2022.
- Comparing five different drugs for anaesthetic maintenance in tiletamine-zolazepam-medetomidine immobilized cheetahs (Acinonyx jubatus) – submitted to Veterinary Anaesthesia and Analgesia in January 2022.

Dr Roxanne Buck

MSc study – Cindy Braud 2019

A number of lessons were learnt during the immobiolisation of cheetahs for the health examinations at Africat over the years. We soon realized that hyperthermia was related to the stress experienced by the cheetahs during the darting process. We also learnt how to best manage the high body temperatures to ensure that the animals remained stable under anaesthesia and went on to make a full recovery. This information lead to another MSc study entitled: A veterinary survey of factors associated with capture-related mortalities in cheetahs (Acinonyx jubatus) in which a total of 75 zoo and wildlife veterinarians were surveyed regarding their experiences in immobilizing captive and free-ranging cheetahs.

Hyperthermia, likely to be associated with capture stress, was the most common reported complication reported (35%). The results also suggested that free-ranging rather than habituated captive cheetahs were particularly at risk of dying during immobilisation and transport. The capture-related fatalities in cheetahs did not appear to be associated with either the veterinarian's level of clinical experience or the immobilisation agents were used. This information is likely to have a dramatic effect on the survival rates of wild cheetahs that are captured for management or translocation purposes. The results of the survey were published in the Journal of the South African Veterinary Association in 2019 (Braud, van Der Merwe, Lane, & Tordiffe 2019).

The research manuscript from this study is currently being reviewed by the journal Veterinary Anaesthesia and Analgesia and will hopefully be published soon.

Ophthalmology

MMedVet (Ophthal) study – Christie Boucher 2016

Dr Christie Boucher completed her specialization in veterinary ophthalmology in 2017 with a research project entitled: Prevalence of ocular pathology in adult captive cheetahs. She examined the eyes of eight female and 18 male cheetahs at AfriCat for her study and established reference parameters for intraocular pressure, tear production and ocular biometry in these animals. Her study was published in the Journal of Zoo and Wildlife Medicine in 2019. (Boucher, Venter, Tordiffe, & Kirberger 2019).

Dr Christie Boucher

Reproductive management and surgical sterilization

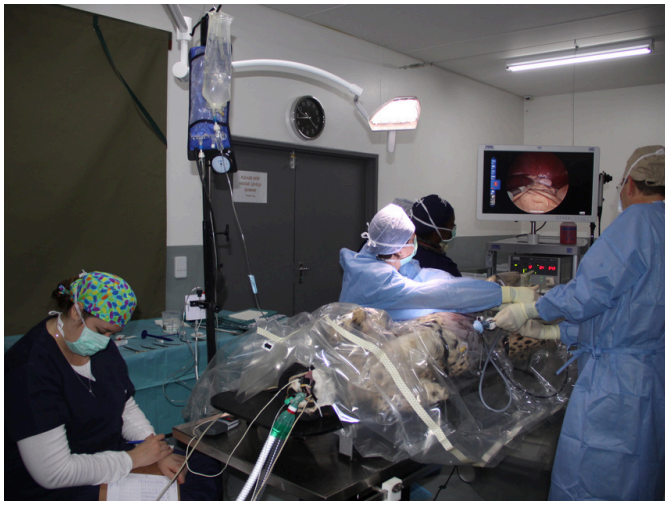
PhD study – Marthinus Hartman 2014 – 2016

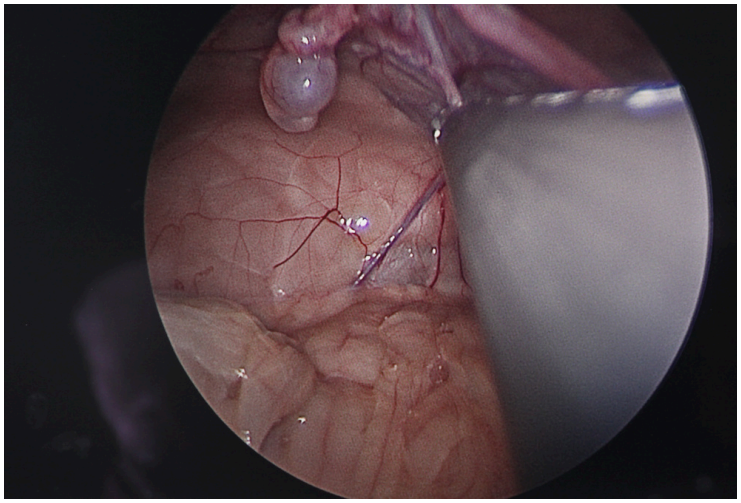
Prof Marthinus Hartman investigated the use of laparoscopic ovarectomy or salpingectomy as methods to prevent breeding in captive cheetahs. He found that both methods were safe and relatively easy to perform.

Salpingectomy was faster to perform in cheetahs. “Effect of portal access system and surgery type on surgery times during laparoscopic ovariectomy and salpingectomy in captive lions and cheetahs” was published in the Acta Veterinaria Scandinavica in 2016 (Hartman et al 2016) and “Single-incision laparoscopic sterilization of the cheetah (Acinonyx jubatus) was published in the journal Veterinary Surgery in 2015 (Marthinus J. Hartman, Monnet, Kirberger, Schmidt-Küntzel, Schulman, Stander, et al. 2015)

The reproductive tracts of 11 nulliparous, relatively aged, female cheetahs at AfriCat were assessed using transabdominal ultrasound. Subsequently, the ovarian findings on ultrasound were compared with direct visulualisation whilst performing laparoscopic sterilization. Many of these aged cheetah showed some ovarian activity and several had paraovarian cysts. They also found that the use of the contraceptive drug deslorelin was not associated with any specific uterine pathology.

This part of the study was published in the journal Theriogenology in 2015 (Schulman, Kirberger, Tordiffe, Marker, Schmidt-Kuntzel, Hartman, et al. 2015) An additional case report of a thorn-induced abdominal foreign body granuloma that was removed with single incision laparoscopic surgery and an extraction bag in 11-year-old female cheetah was published in the journal Veterinary Record Case Reports in 2015. (Hartman, Kirberger, Tordiffe, Boy, Schoeman, Jacobus Hartman, et al. 2015)





Dr Hartman

Prof. Dr.Adrian Tordiffe and
Dr Diethardt Rodenwoldt

MSc study – Miles Penfold 2019

Dr Miles Penfold described the morphology of the uterotubal junction of the cheetah using the preserved reproductive tracts of seven cheetahs from AfriCat that either died of natural causes or were euthanased for humane reasons. Previously unreported branched tubulo-alveolar glands were observed in the papilla housing the uterine ostium. These glands may act as sperm storage areas. He suggested that dilation of these papillary glands in some cheetahs could easily be confused with cystic endometrial hyperplasia. This study was published in the Anatomical Record in 2019 (Penfold, Soley, & Hartman 2019).

Reproductive management and surgical sterilization

One parasite we encountered commonly on the cheetahs at AfriCat was the cheetah biting fly (Hippobosca longipennis). Although this biting fly is said to not cause any disease, the sheer numbers present irritated the animals. As a team we discussed this and had the then evaluated the efficacy of a few different treatments. We found that some of the long-acting drugs like fluralaner were both safe to use and highly effective against the flies. In fact they essentially eliminated the fly problem at AfriCat.

Summary of Dr Henk Berchinger's involvement with AfriCat:

"During 1998 or early 1999 I met Lisa Hanssen at a Cheetah Symposium, which was held at the Ann van Dyk Cheetah Centre. Lisa spoke to me about the problem The AfriCat Foundation potentially my face with unwanted breeding of rescued cheetah, which by law in Namibia was illegal.
I mentioned that we had been testing an exciting new drug called 'deslorelin' that was manufactured in the form of a slow-release implant and should work in both male and female cheetah. We had already started to test the implants, which had been designed for contraception of domestic dogs, in African wild dogs at the Ann van Dyk Cheetah Centre and, the initial results, looked promising.

We promptly agreed to test the implants on cheetah at AfriCat and my first visit followed in May 1999. For me this was the start of a program lasting 16 years; a period, which proved to be scientifically extremely valuable and important for population control of African carnivores.

Nowhere else in the world would it have been possible to collect data on 63 male and 58 female cheetah, which continued in some animals for 7 and 11 years, respectively. Unbelievable when one considers that my colleagues working at zoos in America and Europe have either never treated a cheetah with deslorelin, or, if they had, it would have been restricted to one or two animals. What a privilege it has been.

My visits to AfriCat were always most enjoyable. We were always made to feel most welcome by the family and staff members and treated royally. During the latter years, my wife Renate and I undertook many trips into Namibia allowing us to see some of the beautiful sights the country has to offer. Namibia remains my favourite African country! I was also able to meet some delightful people from overseas who volunteered to help during the annual health checks, as they were soon known.

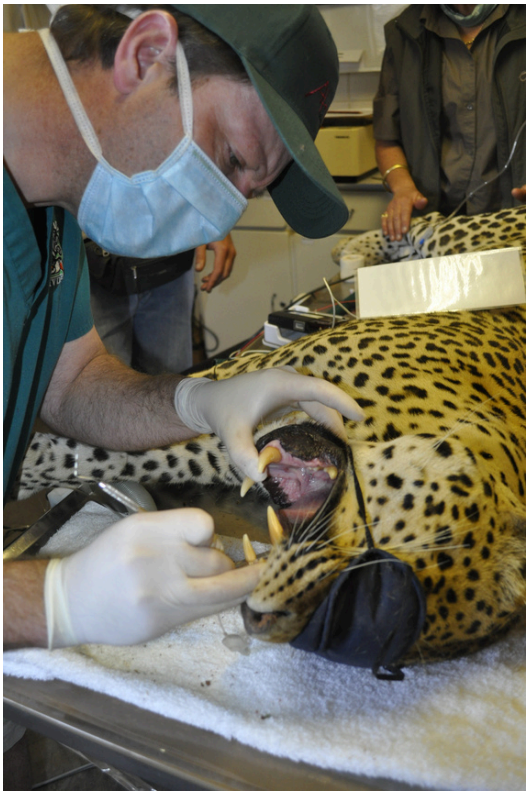
Over the coming years I was able to introduce other veterinary specialist colleagues to AfriCat. Examples are Dr Gerhard Steenkamp and Dr Remo Lobetti and both made significant contributions to the understanding of cheetah health and disease conditions.

I have also written my final scientific article on the cheetah work at AfriCat, which again, thanks to the numbers available, provides data that is impossible to collect anywhere else in the world."

Dr Remo Lobetti; Dr Henk Bertschinger

Other animals at the AfriCat Foundation & Okonjima Reserve

Apart from the welfare and research done on the cheetahs we were involved in treating many different animals on the farm, especially in conjunction with Dr. Diethardt Rodenwoldt, as well as neighbouring farms. Our visits often also coincided with educational exercises, dealing with groups of local school children, guides, university students, volunteers etc. We believe the transfer of knowledge impacted these groups of people and contributed to a wider conservation education driven by the AfriCat Foundation.



Dr Gerhard Steenkamp

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