



UNIVERSITEIT VAN PRETORIA

**FAKULTEIT VEEARTSENYKUNDE
FACULTY OF VETERINARY SCIENCE**

**8th Faculty Day
8^{ste} Fakulteitsdag**

September 26, 1991

**PROGRAM EN OPSOMMINGS
PROGRAMME AND SUMMARIES**



SmithKline Beecham

Fakulteit Veeartsenykunde, Universiteit van Pretoria

Faculty of Veterinary Science, University of Pretoria

AGTSTE FAKULTEITSDAG

EIGHTH FACULTY DAY

26 September 1991

**Sponsored by / Geborg deur: SmithKline Beecham Animal Health Division, A
Division of SmithKline Beecham Pharmaceuticals (Pty) Ltd**

Reëlingskomitee / Organizing Committee

**Proff R.I. Coubrough, J.G. van der Walt, M.M.S. Smuts, B.L. Penzhorn, F.J.M.
Verstraete, I.B.J. van Rensburg; Drr W.A. Schultheiss, J. Ferreira; Mev. C. van
Vuren, Mnr Beukes**

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MESSAGE FROM THE DEAN

PROFESSOR R I COUBROUGH



Brainchild of our former Dean, the late prof Jan le Roux, Faculty Day has become the highlight of our academic year. The day has grown from strength to strength over the past eight years and has become a vital communication forum for our Faculty. Each year a kaleidoscope of faculty talents unfolds anew. Current research results are presented by word of mouth and poster, the focus falls on the activities of a specific Department, and the extramural interests of personnel and students are exhibited, revealing a multitude unexpected talents. It is a day of positive communication and camaraderie which this year we dedicate to the memory of Prof J M W le Roux.

Sincere thanks are extended to prof J van der Walt and his committee for their dedication and hard work, to all the participants for their excellent contributions, to each of you for your active support of the day and to SmithKline Beecham Animal Health, whose generous sponsorship makes the day possible.

PROF R I COUBROUGH

DEAN

CURRICULUM VITAE

PROF D M JOUBERT

MSc(Agric)(Pret), PhD(Cantab), DSc(Stell), L Akad(SA), FI Biol(Lond), FRS(SA), SciNat



Vanjaar se Sir Arnold Theilergedenklesing word deur prof D M Joubert, Vise-kanselier en Rektor van ons Universiteit voorgedra. Prof Joubert het 'n besondere luisterryke loopbaan as navorser, wetenskaplike en opvoedkundige agter die rug. Sedert die werwing van sy BSc(Agric) graad in 1949 het prof Joubert in verskeie hoedanighede 'n noue verbintenis met sy Alma Mater behou en is in 1982 as Vise-kanselier en Rektor aangestel. Voor hierdie aanstelling was hy onder meer Direkteur van die Transvaal Streek in die Departement van Landbou-tegniese Dienste, Sekretaris-generaal van SARCCUS en Vise-president van die WNNR.

Gedurende sy loopbaan was prof Joubert president of voorsitter van 'n groot aantal wetenskaplike instansies, onder andere die Wetenskaplike Adviesraad, en die Komitee van Universiteitshoofde. Hy is pas as **voorsitter van die Landbou Navorsingsraad aangestel**. Hy is 'n volle lid van die S A Akademie van Wetenskap en Kuns, 'n Fellow of the Institute of Biology of London en 'n Fellow of the Royal Society of South Africa. Ander toekennings sluit in die goue medalje van die S A Vereniging vir Dierreproduksie en die Senior Kaptein Scott medalje van die S A Biologiese Vereniging. In 1988 het die Staatspresident aan hom die *Orde vir Voortreflike Diens, Klas 1, Goud* toegeken en in 1989 ontvang hy die *Order of Brilliant Star: Grand Cordon* van die President van die Republiek van China. In 1990 is hy deur die studente van die Universiteit van Pretoria as *Tukkie van die Dekade* vereer.

PROGRAM/PROGRAMME

FAKULTEITSDAG 26 SEPTEMBER 1991 FACULTY DAY

07:30-08:15 REGISTRASIE EN KOFFIE/REGISTRATION AND COFFEE

08:15-17:00 VIEWING OF HOBBIES

08:15-08:30 VERWELKOMING DEUR DEKAAN/WELCOME BY THE DEAN

08:30-09:15 SIR ARNOLD THEILER MEMORIAL LECTURE/GEDENKLESING
Vise-Kanselier en Rektor - Universiteit van Pretoria: Prof D.M. Joubert

09:15-09:45 FOKUS OP: *DEPARTEMENT PATOLOGIE*

FOCUS ON: *DEPARTMENT OF PATHOLOGY*

09:45-10:45 RESEARCH PROGRAMME/NAVORSINGSPROGRAM

Session I/Sessie I

Chairman: Prof P. Bland-vd Berg

1. Student evaluation: How many questions are enough?
F. Reyers
2. An *in vitro* comparison of two techniques for substituting a ruptured cranial cruciate ligament in the dog.
G.L. Coetzee
3. The histological nature of epulides in the dog.
F.J.M. Verstraete, A.J. Ligthelm & A. Weber
4. Telemetric determination of *in vivo* electrical activity and motility of the equine myometrium.
D.H. Volkmann, A.J. Guthrie, H. Kündig, H.J. Bertschinger & K. Zerobin

10:45-11:00 TOEKENNING AAN "DOSENT VAN DIE JAAR"

"LECTURER OF THE YEAR" AWARD

11:00-12:30 BRUNCH (for registered participants/vir geregistreerde deelnemers)

12:30-13:15 NAVORSINGSPROGRAM/RESEARCH PROGRAMME

Sessie II/Session II

Voorsitter: Prof G.F. Bath

5. Modifications to a method for the cryopreservation of stallion semen in 0,5 ml straws.
M.L. Schulmann, D.H. Volkmann & M.W. Longridge
6. The effect of hemicastration on selected semen parameters in SA Mutton Merinos.
G.P. Staley & D.H. Volkmann
7. Social suppression of reproduction in female Naked Mole Rats.
L.M. Westlin, J.U.M. Jarvis & N.C. Bennet

13:15-14:00 **RESEARCH PROGRAMME/NAVORSINGSPROGRAM**Session III/Sessie III

Chairman: Prof L. Coetzee

8. Evaluation of probe technology for the detection of *Salmonella* spp. in poultry feed ingredients.
R.R. Bragg
9. Is the Cheetah immunodeficient?
J.A. Spencer
10. The detection of Bluetongue virus by the *in situ* hybridization technique.
E.H. Venter & J.J. van der Lugt

14:00-15:00 **REFRESHMENTS AND VIEWING OF POSTERS****VERVERSINGS EN BESIGTIGING VAN PLAKKATE**

Voorsitter: Prof J.G. van der Walt

15:00-15:45 **NAVORSINGSPROGRAM/RESEARCH PROGRAMME**Sessie IV/Session IV

Voorsitter: Dr R.A. Meintjes

11. Construction of a standard oxygen-haemoglobin dissociation curve for thoroughbred horse blood.
A.J. Guthrie, J. Taylor, R. Meintjes & J.G. van der Walt
12. Die effek van narkose en chirurgie op plasmakortisol in perde.
G.F. Stegmann
13. The effect of endogenously produced carbon monoxide on the oxygen status of dogs infected with *Babesia canis*.
J.H. Taylor, A.J. Guthrie & A. Liesewitz

15:45-16:30 **RESEARCH PROGRAMME/NAVORSINGSPROGRAM**Session V/Sessie V

Chairman: Prof D.G.A. Meltzer

14. Effect of dehydration on the volumes of body-fluid compartments in horses.
J. Sneddon, J.G. van der Walt & G. Mitchell
15. A quantitative study of filamentous microorganisms on Cyathostomes in Hartmann's Mountain Zebra.
R.C. Krecek, E. Hill & H.J. Els
16. Comparative pathology of anthrax in free-living game.
N.P.J. Kriek & V. de Vos

16:30-16:40 **DEAN'S AWARD FOR BEST PAPER AND POSTER****DEKAANSTOEKENNING VIR BESTE REFERAAT EN PLAKKAAT**16:40-16:45 **AFSLUITING/CONCLUSION**

Prof J.G. van der Walt.

16:45-20:00 **COCKTAIL PARTY/SKEMERPARTYTJIE**

All welcome - Almal welkom

RESEARCH PROGRAMME/NAVORSINGSPROGRAM

SHORT COMMUNICATIONS/KORT MEDEDELINGS

STUDENT EVALUATION: HOW MANY QUESTIONS ARE ENOUGH ?

F. Reyers

Department of Medicine

Both from the point of view of the student (time spent being evaluated) and the lecturer (time spent evaluating) it would be useful to know how many questions should be asked before one can say, with a known degree of error, whether the student should pass, fail or even gain a distinction.

To this end, the records of student performance on 58 written questions, set in 6 tests in clinical pathology (1988 to 1991), were analysed. The effect of question order was removed by modelling the entire set of possible permuted combinations in the analysis. A student was defined as being a pass or distinction candidate if his/her average mark for 10 consecutive questions was $\geq 50\%$ or 75% respectively. The analysis was performed using Bayesian probability statistics.

If a student passed any single first question, then the probability of his being a pass candidate was 90%. This probability reached 95% by the time the student had successfully answered the first 5 questions. More questions did not significantly improve this 95% level until 10 questions had been asked.

If a student failed any single first question, then the probability of his being a "fail" candidate was as low as 30%. Failure of subsequent questions rapidly improved the predictive value of his performance (in terms of being a fail candidate). By the time any 4 consecutive questions had been failed there was an 80 to 90% probability that the student was a fail candidate and after 5 questions this reached 100%, and could not be improved upon by asking more questions. If a student passed some and failed other questions, then more than 5 questions were required to correctly classify such a student as a pass or fail candidate.

If a student did not obtain a distinction on the first question answered, then the probability that he was not a distinction candidate was already in excess of 95%. However, up to 10 questions were required to determine whether the student was a distinction candidate if he did not achieve a distinction grade on each of the first 5 questions.

It may be concluded from this that a test composed of 5 questions is sufficient to correctly classify a student (with a 95% certainty) as a pass or fail candidate and whether he is unlikely to be a distinction candidate, provided he performs consistently on all 5 questions. If his performance is not consistent, up to 10 questions may be required to predict the outcome with a 95% certainty.

AN *IN VITRO* COMPARISON OF TWO TECHNIQUES FOR SUBSTITUTING A RUPTURED CRANIAL CRUCIATE LIGAMENT IN THE DOG

G.L. Coetzee

Department of Surgery

This study was designed to compare the immediate postoperative structural and material properties of a ligament substitute used in the "under-and-over" technique (SH) described by Shires and Hulse (1984) and a modified "under-and-over-the-top" technique (UOTT).

Surgery was performed in 12 adult Alsatians, divided into two equal groups. In both groups, the right cranial cruciate ligament (CCL) was dissected out and replaced by an autogenous *fascia lata* graft which contained the lateral one third of the patellar ligament. The contralateral stifle served as the control. In the SH group, the graft was secured to the lateral femoral condyle with a spiked washer and screw. In the UOTT group the intracapsular graft was secured to the lateral femoral-fabellar ligament and the remainder of the graft to the patellar ligament. After completion of surgery, each stifle was palpated for instability. All the control stifles were stable, while both the SH group and the UOTT group exhibited a 2mm anterior drawer. The dogs were euthanized and all muscles and ligaments dissected to isolate normal and reconstructed CCLs.

Prior to testing, the length and cross-sectional area of each CCL was determined. The femur and tibia were fixed in sliding clamps to maintain the stifle in a 120° angle. Each bone-ligament-bone unit was tested to failure in cranial drawer in an electro-hydraulic strain tester. A clip gauge attached to the ligament insertions measured any change in length. Failure was evaluated at a fixed displacement rate of 100% of the specimen length per second. All data was processed by computer to obtain relevant material parameters (modulus, maximum stress and strain and energy to maximum load).

Control CCL preparations failed either by interstitial tearing ($n = 4$), through fracture of the femoral condyle ($n = 6$) or of the tibia ($n = 2$). The SH substitutes failed either by pulling out from underneath the spiked washers ($n = 3$) or by interstitial tearing ($n = 3$). All the UOTT substitutes failed due to interstitial tearing. Maximum force to failure recorded for the control CCL, SH and UOTT group was 1279 ± 99 N, 296 ± 44 N and 218 ± 26 N respectively. Elongation to maximum load was only $3,3 \pm 0,4$ mm for the control CCL, while the SH group recorded $9,3 \pm 1,3$ mm displacement and the UOTT group $12,1 \pm 1,1$ mm. Stiffness in linear loading to maximum was very high in control CCL preparations (396 ± 18 KN/m). Stiffness in the UOTT and SH groups was $24,4 \pm 3,4$ and $23,2 \pm 3,2$ KN/m respectively.

The UOTT approach combining intra- and extracapsular replacement for ruptured CCL was 11,7% stronger than the conventional SH method, but allowed 3mm more cranial tibial displacement immediately after surgery. This increase in laxity may subject the secondary stabilising structures around the stifle joint to more biomechanical strain before the new substitute ligament can serve as the primary stabiliser.

THE HISTOLOGICAL NATURE OF EPULIDES IN THE DOG

F.J.M. Verstraete, A.J. Ligthelm¹ & A. Weber¹

Dental Clinic, Department of Surgery, ¹Department of Oral Pathology and Oral Biology, Faculty of Dentistry

Epulides are common gingival lesions in the dog. There is a continuing confusion as to the nomenclature and exact nature of these lesions. The objective of this study was to review the histological characteristics of a series of 154 tumours that clinically presented as epulides in 129 dogs. Diagnoses were based on current criteria in human oral pathology and compared with the original diagnoses.

The histological findings suggested that the majority of epulides in the dog can be classified as focal fibrous hyperplasia (44%), peripheral ameloblastoma (18%), peripheral odontogenic fibroma (WHO type) (17%), and pyogenic granuloma (2%). In addition a number of other odontogenic tumours (2%) and malignant non-odontogenic tumours (18%) such as fibrosarcoma and squamous cell carcinoma, which are not traditionally associated with the clinical presentation of an epulis, were diagnosed. Of 74 lesions that were previously diagnosed as fibromatous and ossifying epulis, 50 (68%) were reclassified as focal fibrous hyperplasia and 21 (28%) as peripheral odontogenic fibroma (WHO type). The majority of lesions (76%) which were originally classified as acanthomatous epulis, were found to be peripheral ameloblastoma; in addition 3 squamous cell carcinomas, 2 rare odontogenic tumours and 2 cases of focal fibrous hyperplasia were diagnosed.

TELEMETRIC DETERMINATION OF *IN VIVO* ELECTRICAL ACTIVITY AND MOTILITY OF THE EQUINE MYOMETRIUM

D.H. Volkmann, A.J. Guthrie¹, H. Kündig², H.J. Bertschinger and K. Zerobin²

Department of Theriogenology, ¹Equine Research Centre, ²University of Zürich

The aim of this pilot study was to test the feasibility of recording electromyographic activity (EMG) and motility of the equine myometrium *in vivo* using a passive telemetric system. This technique promises to be a valuable research tool, because it eliminates the need for placing intra-luminal pressure recording devices into the uterine lumen or maintaining transcutaneous electrical wires or catheters through the skin of the mare.

A strain gauge and a set of three EMG electrodes were surgically implanted under the serosa of the tip of the right uterine horn of a mare. Another strain gauge and set of EMG electrodes were implanted near the base of the same uterine horn. The amplifiers and modulators for each pressure and EMG signal were implanted in the peritoneal cavity and the loop antennae from each channel were fixed subcutaneously in the flank region of the mare. In order to record data, an external loop antenna was fixed to the skin overlying the internal antennae. This external antenna supplied the power for amplifiers and modulators electromagnetically and received the output signals from each of the data channels. Output signals from each of the transducers were then demodulated by a custom 4-channel radio receiver apparatus, which was interfaced with an analog-to-digital converter in a personal computer. The digital signals were displayed on the computer screen and stored to disk files. Successful recordings were made from both pressure transducers, but the recordings of EMG appeared to be less successful.

Five days after implanting the sensors, the effects of various drugs modulating uterine motility were studied over a period of 2 days, during which time the mare was in early dioestrus. Oxytocin caused long myometrial contractions, each lasting 3-7 min, over a period of 40 min. Clenbuterol significantly reduced the effect of oxytocin (given 3 min after clenbuterol) for at least 1h. Prostaglandin F_{2α} caused intense short uterine contractions of 1-2 min each, over a period of 40-60 min. Myometrial responses to teasing, digital stimulation of the cervix and intra-cervical treatment with Prostaglandin E₂ were inconclusive. These results suggest that similar studies should always cover the entire reproductive cycle of the animal under study, should be restricted to one drug per day and should be based on extensive recordings of baseline activity.

The system proved to be extremely successful and should revolutionise the study of uterine function in the mare. With minor modifications, the implanted transducer system promises to remain functional over several months in a single horse. Non-reproductive applications of the system in equines and other species may include studies of gastro-intestinal motility and pulmonary function.

MODIFICATIONS TO A METHOD FOR THE CRYOPRESERVATION OF STALLION SPERM IN 0,5 ML STRAWS.

M.L. Schulman, D.H. Volkmann & M.W. Longridge¹

Department of Theriogenology, ¹A.E.C.I.

The existing technique used in our laboratory for the cryopreservation of stallion sperm in 0,5 ml straws involves diluting fresh semen to a concentration of 50×10^6 sperm/ml, and then centrifuging this sample at 20 °C to concentrate the sperm. This technique may be simplified by halving the volume of the diluted semen, and by centrifuging the sample in a desk-top centrifuge at ambient temperature.

The trial utilised 5 ejaculates collected from each of 2 stallions. After collection, the gel-free fresh semen of each ejaculate was divided into 2 aliquots, both of which were diluted in Centrifugation Medium, one to a concentration of 50×10^6 sperm/ml (Treatment 1) and the other to a concentration of 100×10^6 sperm/ml (Treatment 2). After dilution, each treatment was divided again, with one half being centrifuged in a temperature-controlled centrifuge at 20 °C (Treatments 1:A and 2:A) and the other half centrifuged in a desk-top centrifuge at ambient temperature (Treatments 1:B and 2:B). All 4 treatments were then subjected to the same freezing and thawing procedures. The effects of these treatments on sperm quality were evaluated by examining sperm viability (by both the phase contrast microscopic estimation of progressive sperm motility (PSM) and the Triple Stain Method (TSM)), and acrosomal integrity (by Spermac staining and the TSM). The sperm quality was determined on aliquots drawn from fresh (FFF), post-centrifugation (FCC) and post-thaw (FCT) semen.

The post-centrifugation (FCC) and post-thaw (FCT) PSM were not significantly different for either of the dilution rates or centrifugation methods ($f = 0,54$ and $p = 0,46$; $f = 1,87$ and $p = 0,18$; respectively). The TSM results showed no significant effects of the dilution rate or the centrifugation method on either the viability or the acrosomal integrity of the sperm. The acrosomal integrity as determined by Spermac was also unaffected by either the dilution rate or the centrifugation method.

The results suggest that it is feasible to use a simple, portable centrifuge to process smaller volumes of stallion semen diluted to a concentration of 100×10^6 sperm/ml without any significantly deleterious effect on the quality of cryopreserved stallion sperm.

THE EFFECT OF HEMIORCHIDECTOMY ON VARIOUS SEMEN PARAMETERS IN S.A. MUTTON MERINOS

G.P. Staley and D.H. Volkmann

Department of Theriogenology

Hemiorchidectomy has been used to manage various clinical conditions in the male animal. The effects of this procedure on semen have recently been described in the bull, dog and stallion but, to date, no such controlled study has been performed on rams.

Fifteen, 1-year old, S.A. Mutton Merino rams were divided into two groups (Group A, n = 7; Group B, n = 8) by randomisation according to mass.

Pre-surgical values for progressive sperm motility; percentage live sperm; percentage normal sperm; percentage sperm with major defects and percentage sperm with minor defects were obtained. Group B rams were hemicastrated using a partial scrotal ablation technique. There were no surgical complications in any of the rams and clinical healing had occurred 10 days after surgery. Semen was collected by electro-ejaculation from both groups every 2 weeks for 3 months and the same semen parameters were determined.

There was no persistent significant difference in the various parameters of semen quality at any stage. Compensatory testicular hypertrophy had occurred in the hemicastrates 90 days after surgery.

This study has shown that hemicastration with partial scrotal ablation is a successful surgical technique and 1-year old hemicastrates can be used for breeding from 7 days after surgery.

SOCIAL SUPPRESSION OF REPRODUCTION IN FEMALE NAKED MOLE-RATS

L.M. Westlin, J.U.M. Jarvis¹ & N.C. Bennet¹

Department of Theriogenology, ¹Department of Zoology, University of Cape Town

Naked mole-rats are underground-living hystrichognath rodents, forming colonies with a social structure resembling that of social insects. Such a colony consists of one breeding female, "the Queen", 1-3 breeding males and a number of female "workers", regarded as non-reproductive. Earlier studies have established that the oestrus cycles of non-reproductive females are suppressed mainly by aggression from the Queen, although a chemical component may also be involved. This leads to lowered levels of LH and a failure to ovulate, indicated by very low or undetectable levels of progesterone. The suppression was shown to be reversible. It was later discovered that some non-breeding females in colonies with a resident Queen were occasionally found with perforated vaginas, a condition normally occurring only during oestrus in hystrichognath rodents. That discovery, together with the observations that vaginal perforation occurred shortly after separation of non-breeding females from the colony and that progesterone subsequently rose to a level indicating a luteal phase, suggests the possibility that non-breeding females may experience a variation of the level of sexual suppression during the breeding cycle of the Queen. We therefore decided to study occurrence of vaginal perforation, vaginal smears and urine levels of oestradiol-17 β in non-breeding females in relation to behaviour and reproductive status of the Queen.

Randomly chosen non-breeding females (N = 97) from 5 colonies housed at the University of Cape Town were studied during 9 breeding cycles of their Queens. The presence of perforated or closed vagina was noted on a daily basis. Smears were taken with a rounded toothpick from females with vaginal openings. Urinary samples were collected by means of gentle rubbing of the genital region. This was not always successful in all animals. The behaviour and the reproductive stage of the Queen was noted.

As the Queen approached parturition, specific individuals underwent physiological changes, including vaginal perforation, changes in vaginal smear patterns and a surge of urine concentrations of oestradiol-17 β , all coinciding with the time of markedly reduced aggression expressed by the Queen.

The results indicate that certain non-reproductive females may experience a decreased level of aggression from the Queen, leading to a lowering of the level of sexual suppression and resulting in a reproductive boost. We suggest that should the Queen be eliminated at this stage of her reproductive cycle, one or more of these females would be capable of rapidly succeeding to her breeding role in the colony.

EVALUATION OF PROBE TECHNOLOGY FOR THE DETECTION OF *SALMONELLA* spp IN POULTRY FEED INGREDIENTS

R.R. Bragg

Department of Poultry Diseases

Samples of ingredients used in the production of poultry feeds are being tested for the presence of *Salmonella* species by conventional methods. Recently, commercially available probe kits for the detection of *Salmonella* spp. have come onto the market. The aim of this project was to investigate the feasibility of using the probe kits to replace the conventional methods for the detection of *Salmonella* spp. in poultry feed ingredients.

The specificity of the probes was first evaluated by carrying out the probe procedure on pure samples of different bacteria (*Salmonella* as well as non-*Salmonella* isolates). The sensitivity of the probes vs conventional method was evaluated by artificially inoculating samples of feed ingredients with known concentrations of a *Salmonella* isolate. The third and final method of evaluation was to test field samples by the conventional and probe methods in parallel.

It was found that the probes detected *Salmonella* species only; even the very closely related *Citrobacter freundii* was not detected. The probes are thus highly specific for *Salmonella* spp. Little difference between the sensitivity of the conventional method and the probes was detected on artificially infected feed samples. The sensitivity is more dependent on the selective medium which is used to culture the bacterium. No differences between the conventional methods and the probes could be detected on the field samples.

It can thus be concluded that there is no marked difference between the conventional methods and the probes in relation to sensitivity and specificity. The time taken to test the samples is the same for the conventional as well as the probe method. The only marked difference is the cost of testing, with the probes being in the order of 100x more expensive. At this stage, it is unlikely that probe technology will be employed for the routine testing of poultry feed ingredients for *Salmonella* spp.

IS THE CHEETAH IMMUNODEFICIENT?

J.A. Spencer

Department of Infectious Diseases

It has been hypothesised that the cheetah (*Acinonyx jubatus*) is immunodeficient, and therefore highly susceptible to infectious diseases. This is based on the observation that the cheetah does not reject allogenic skin grafts. In order to test this hypothesis, the humoral and cell-mediated immune responses of the cheetah were investigated.

Thirty animals of ages 1 to 14 years were used with domestic cats as the control species. Humoral immune responses to vaccination were monitored and it was found that there was positive sero-conversion to all components of the modified live-virus vaccine used. Animals were bled at the time of vaccination and again one month later. Cell-mediated immune responses were determined by means of lymphocyte blast transformation assays *in vitro*.

The results obtained from the cheetahs were compared with those of domestic cats - a species not considered to be immunodeficient. It was shown that there were no significant differences between the two species.

However, a lack of genetic variation in the cheetah has been further demonstrated by studying allozymes and using DNA probes to the MHC 1 and MHC 11 loci. This has led to the proposal that the cheetah is immunotolerant to skin grafting rather than it being an immunodeficient species.

THE DETECTION OF BLUETONGUE VIRUS BY THE IN SITU HYBRIDISATION TECHNIQUE

E.H. Venter and J.J. van der Lugt¹

Department of Infectious Diseases, ¹Section of Pathology, VRI

Dot spot as well as a conventional *in situ* hybridisation (ISH) techniques have been used for the detection of bluetongue virus (BTV).

The aims of this study were to obtain a sensitive technique for the diagnosis of BTV and to develop the conventional ISH technique in tissue sections for future study of BTV infections.

The dot spot ISH technique was applied to tissue culture cells. BHK cells were infected with different multiplicities of infection and after certain times post infection the cells were fixed and probed. BTV 4 genome segment 5, coding for the non-structural protein NS1, was used as probe.

The conventional ISH technique was applied to BTV infected tissue culture cells as well as sections of infected tissues to detect m-RNA during viral replication. BHK cells, grown on microscopic slides, were infected with BTV 4 and at certain times post infection the slides were fixed and probed with BTV 4 S5. The probe was also applied to formalin-fixed paraffin-embedded sections of brain from mice which were infected intracerebrally with BTV 10 at one day of age.

At an initial inoculation of 1×10^{-5} pfu/cell detection of the m-RNA with the dot spot ISH technique was possible after only 48h. BTV m-RNA was also detected at 2h post infection in infected tissue culture cells with the conventional ISH technique. Viral nucleic acids could also be detected in the sections of mouse brain.

The dot spot ISH technique proved to be a sensitive and rapid method for the diagnosis of BTV. The conventional ISH technique is intended to be used, in addition to currently available techniques, in the study of the pathogenesis of BTV.

CONSTRUCTION OF A STANDARD OXYGEN-HAEMOGLOBIN DISSOCIATION CURVE FOR THOROUGHBRED HORSE BLOOD

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The aim of this study was to collect data to describe the oxygen-haemoglobin dissociation curve (ODC) associated with blood from Thoroughbred horses. These data were used to determine an appropriate mathematical model for the ODC of blood from Thoroughbred horses under standard conditions.

Venous blood samples of 100 ml each were collected from the jugular veins of 10 clinically healthy Thoroughbred horses during this project. 25 ml of each blood sample were placed in a Büchi apparatus and desaturated of oxygen by continuous exposure to a CO₂:N₂ gas mixture (pCO₂ ≈ 40 mmHg), saturated with water vapour at 40 °C, for a minimum of 30 minutes. Another 25 ml of blood was saturated with oxygen by repeatedly introducing approximately 25 ml of a CO₂:O₂ gas mixture (pCO₂ ≈ 40 mmHg) into the syringe, allowing the gases to equilibrate while the syringe was gently agitated, and expelling the gas. Two syringes (one containing saturated or desaturated blood and the other containing venous blood) were attached to two ports of a 3-way adapter. A 2 ml syringe was attached to the third port on the adapter. Blood samples, ranging from completely desaturated to completely saturated, were then prepared by drawing varying amounts of blood from each of the 50 ml syringes into the 2 ml syringe. Between 10 and 20 samples with different oxygen saturations were prepared in this manner. The pH, pO₂, and pCO₂ of each blood sample was measured using a blood gas analyser (ABL3, Radiometer, Copenhagen). The oxygen saturation, carboxy-, met-, and total haemoglobin concentrations of each sample were also measured using a multiple wavelength haemoximeter (OSM3, Radiometer, Copenhagen).

A hyperbolic tangent model of the oxygen-haemoglobin dissociation curve which includes correction factors for pH, pCO₂, carboxyhaemoglobin and methaemoglobin was derived by fitting the blood-gas and haemoximeter data from each sample using an iterative least-squares technique in the SAS Proc NLIN procedure. The model described 99,62% of the total variance of the observed data.

It was concluded that this model provides a reliable description of the ODC of blood from Thoroughbred horses. This model has many potential applications in studies of the cardiovascular and respiratory systems at rest, during exercise and during anaesthesia.

DIE EFFEK VAN NARKOSE EN CHIRURGIE OP PLASMAKORTISOL IN PERDE

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Daar is reeds by diere aangetoon dat chirurgie asook algemene narkose as stressors veranderings in plasmakortisolkonsentrasie kan veroorsaak; dit kom nie voor by mense nie. Die doel van hierdie ondersoek was om te bepaal of die plasmakortisolkonsentrasie deur die induksiemetode beïnvloed word, en om faktore gedurende chirurgie te identifiseer wat ook 'n invloed uitoefen.

Studiemateriaal is verkry van kliniese gevalle by die Universiteit van Liverpool, Engeland. Die gevalle het gevarieer van vel- en ortopediese chirurgie tot abdominale noodchirurgie. Vir statistiese vergelyking is die gevalle in twee groepe verdeel, nl. nie-abdominaal en abdominaal. Lg. is onderverdeel in abdominaal elektief en abdominaal nood. Narkose is geïnduseer met GGE gevolg deur thiopentoon, of detomidien-ketamien; onderhoud was met halotaan en suurstof. Die Studente t-toets is vir analise van data gebruik tussen groepe, asook binne groepe.

Geen verskil kon aangetoon word tussen die twee induksietegnieke nie. Pre-operatief was daar reeds groot verskille in plasmakortisolkonsentrasie tussen die abdominaal nood ($138,3 \pm 85,1 \text{ ng/ml}$) en abdominaal elektief ($58,8 \pm 25,7 \text{ ng/ml}$) en nie-abdominaal groepe ($54,5 \pm 33,5 \text{ ng/ml}$). Ten spyte van groot individuele variasies kon die volgende faktore geïdentifiseer word wat statisties betekenisvolle veranderings in die plasmakortisolkonsentrasie veroorsaak het:

1. preoperatief verhoog ($p < 0,05$) by die abdominaal nood groep na die kliniese ondersoek van die perd,
2. intraoperatief verhoog ($p < 0,05$) by die nie-abdominaal groep met die aanvang van chirurgie, asook verder gedurende die verloop van chirurgie ($p < 0,05$),
3. herstel van narkose by die nie-abdominaal groep ($p < 0,01$), asook vir al die perde saam ($p < 0,001$),
4. postoperatief by die abdominaal nood en elektief groepe die verlaging binne die eerste 24 uur ($p < 0,01$), en
5. kortisol waardes in die abdominaal nood groep het eers na 60 uur soortgelyke waardes as die ander groepe bereik.

Die kliniese ondersoek van koliekperde moet so gehanteer word dat verdere stres tot die minimum beperk moet word. In dié gevalle was die narkose waarskynlik nie voldoende addisionele stres om die kortisolkonsentrasies verder te verhoog nie, en het die gemiddelde konsentrasie in der waarheid tot voor die aanvang van dermmmanipulasie begin daal. Hierteenoor was narkose en chirurgie 'n voldoende stimulus vir verhoging van plasmakortisol by die ander groepe. Die verhoging met herstel van narkose kan moontlik gekoppel word aan post-operatiewe pyn asook die hipoksie en rondval as die perd begin opstaan. Die verbetering in die kliniese toestand van die perd word weerspieël in die skerp daling van plasmakortisol in die eerste 24 uur post-operatief by die koliek perde. Dit het egter ongeveer 60 uur geneem voordat hul plasma kortisolkonsentrasie tot dieselfde konsentrasie as die ander groepe gedaal het.

THE EFFECT OF ENDOGENOUSLY PRODUCED CARBON MONOXIDE ON THE OXYGEN STATUS OF DOGS AFFECTED WITH BABESIA CANIS

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Canine babesiosis is an extremely common haemolytic disease affecting dogs in South Africa. Certain dogs on clinical examination appear more hypoxic than other dogs with similarly low haemoglobin concentrations. The enzymatic conversion of haem to biliverdin via haem oxygenase is currently the only known source of endogenous carbon monoxide. We proposed that an increased production of endogenous carbon monoxide following haemolysis would result in an increased fraction of carboxyhaemoglobin.

Blood from five dogs confirmed *Babesia canis* positive was compared with blood from five clinically normal dogs using a multiwavelength haemoximeter. Carboxyhaemoglobin fractions were found to be significantly higher ($p < 0,05$) in the group with severe babesiosis than in the clinically normal control dogs.

By utilizing the Siggaard Anderson oxygen status algorithm, the oxygen extraction tensions (P_x) of a normal dog, a dog with an anaemia and a dog with an anaemia and concurrent carboxyhaemoglobinaemia were calculated. The P_x values derived were 38,6 mmHg for a normal dog, 15,4 mmHg for a dog with a haemoglobin concentration of 47g/l and 12,7 mmHg for a dog with a haemoglobin concentration of 47g/l and a concurrent carboxyhaemoglobinaemia of 5,2%.

These results suggest that the oxygen status of a dog with concurrent carboxyhaemoglobinaemia is worse than that of a dog with anaemia alone. The superimposition of carboxyhaemoglobinaemia upon severe anaemia results in a further compromise of the oxygen status of dogs with severe babesiosis and probably further exacerbates the anaemic hypoxia associated with this condition.

This finding has implications for the therapy of severe haemolytic anaemia.

EFFECT OF DEHYDRATION ON THE VOLUMES OF BODY-FLUID COMPARTMENTS IN HORSES

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Maintenance of plasma volume during dehydration is essential for adequate cardiovascular function, and thus survival in mammals. Sources of fluid are the interstitial, the intracellular and transcellular (primarily the hindgut in horses) fluid compartments.

We studied the changes in volumes of these compartments after a 60 h period of dehydration in arid-adapted horses from Namibia (Namib horses) and in farm horses from the Transvaal (Boerperd).

Of the total fluid lost, about 6% came from the plasma, about 27% from the interstitial space, and 67% from the transcellular/intracellular space. Namib horses lost more fluid from the interstitial space (29%) and less from the transcellular space (65%), than did Boerperd (21% and 73% respectively), assuming negligible loss from the cells themselves. Namib horses absorbed intestinal fluid twice as fast as did Boerperd, and lost a fluid that was more concentrated than that lost by the Boerperd ($148 \pm 6,1$ versus $136 \pm 11,6$ mmol/l).

We conclude that horses protect their plasma volume as effectively, and with similar mechanisms to those of other arid-adapted mammals such as donkeys, camels, desert sheep and goats, during acute dehydration, and that the Namib horses were more efficient in this respect than the Boerperd.

A QUANTITATIVE STUDY OF FILAMENTOUS MICROORGANISMS ON CYATHOSTOMES IN A HARTMANN'S MOUNTAIN ZEBRA

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The presence of (filamentous) microorganisms on cyathostomid nematodes recovered from the ventral colon of the zebra has been reported. The objective of this study was to quantify this microbe: nematode association and to determine whether these microbes hinder the reproductive capacity of the females.

At post-mortem examination of a Hartmann's mountain zebra from the Etosha National Park, standard methods of recovery of nematodes were employed. Using light, scanning and transmission electron microscopy, 10 cyathostome species were identified and the presence and site of attachment of the filamentous microorganisms for each determined. A total of 877 cyathostomes were identified in a one-hundredth aliquot of the ventral colon ingesta.

Fifty-three percent of the total cyathostome population were female and 47% male. Sixty-seven percent of the female and 3% of the male cyathostomes were associated with the microorganisms. The microorganisms were usually associated with the vulva and anus and the dorsal ray of the male.

To determine whether these microbes hinder the reproductive capacity of the adult females, the uteri were examined for eggs. The majority of *Cyathostomum montgomeryi* did not contain eggs but the distal end of the vagina was filled with a cement plug with embedded microbes. In contrast, *Cylicocyclus triramosus* contained eggs despite a dense mass of microbes associated with the vagina and rectum. In addition, examination of the depth which these microbes penetrate the vagina and rectum of the female was made. The density of the microbes, though, hindered a thorough examination. Further studies are needed to determine what the magnitude of this penetration is.

COMPARATIVE PATHOLOGY OF ANTHRAX IN FREE-LIVING WILDLIFE

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The lesions caused by anthrax in various free-living wildlife species were investigated during a natural outbreak of the disease in the Kruger National Park.

Fresh carcasses of 19 animals that died of the disease were examined macroscopically, histopathologically and in respect of the characteristic appearance of blood smears prepared from the dead animals.

Significant interspecies differences were observed in respect of the degree of bacteraemia, localization of the lesions and the gross and histopathology. Thus impala (*Aepyceros melampus*) manifested a severe bacteraemia but no organ localization and lesions. In buffalo (*Syncerus caffer*) the situation varied from a marked bacteraemia with few organ lesions to that in which localization and extensive necrotic lesions occurred in single organs. Kudu (*Tragelaphus strepsiceros*), waterbuck (*Kobus ellipsiprymnus*), roan antelope (*Hippotragus equinus*) and nyala (*Tragelaphus angasii*) manifested a typical haemorrhagic septicaemia accompanied by an overwhelming bacteraemia. Lions (*Panthera leo*), on the other hand, consistently developed localized lesions on the face, tissues of the buccal cavity and the tongue, and did not manifest the signs of a haemorrhagic septicaemia.

The variation in the manifestation of anthrax in the various species is important particularly in respect of the pathogenesis of the lesions and the ease of the initial diagnosis of the disease.

NAVORSINGSPROGRAM/RESEARCH PROGRAMME

PLAKKATE/POSTERS

SEDATIVE-ANALGESIC ACTION AND CARDIOPULMONARY EFFECTS OF THE α_2 -AGONIST MEDETOMIDINE IN WILD DOGS.

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Medetomidine 4-[1-(2,3-dimethylphenyl)ethyl]-1H-imidazole is a potent selective and specific agonist of both pre- and post-synaptic α_2 -adrenoceptors. The α_2 -adrenoceptor-mediated effects of medetomidine include sedation, analgesia, anxiolysis, hypotension, bradycardia, mydriasis and inhibition of the motor and secretory functions of the gastrointestinal tract.

Medetomidine has been used as a sedative, an analgesic, a pre-anaesthetic and as an anaesthetic in combination with other drugs in domestic dogs, cats and a variety of captive wild mammals. In the present study, captive wild dogs (*Lycaon pictus*, n = 10) were treated with either medetomidine or a medetomidine/ketamine hydrochloride combination at dosages ranging from 43-121 μ g/kg and 2.6-3 mg/kg, respectively. Blood chemical, haematological, hormonal and electrocardiographic parameters as well as rectal temperatures, pulse and respiratory rates were determined in immobilised animals.

Nine dogs were sedated and partially or completely immobilised for periods ranging from 25 min to 6 hours 27 minutes. Full anaesthesia was not achieved. Bradycardia, a drop in respiratory rate as well as in rectal temperature were recorded in experimental subjects. The most marked changes in clinical laboratory parameters included low serum concentrations of cortisol, adrenaline, noradrenaline, dopamine and insulin as well as a rise in the concentration of serum glucose. Electrocardiographic findings included brady-arrhythmias and ventricular escape beats. Medetomidine was found to be an effective sedative in wild dogs but should preferably be used in combination with ketamine to achieve effective immobilisation, analgesia and anaesthesia.

SUSPECTED CYCAD (*Cycas revoluta*) INTOXICATION IN DOGS

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Cycads belong to the order *Cycadales* in which the following 3 families are recognised: *Cycadaceae*, *Stangeriaceae* and *Zamiaceae*. In South Africa cycads belonging to the genus *Encephalartos* are known as "broodbome". Cycad poisoning has been reported in man, cattle, sheep and dogs. In cattle and sheep there are 2 distinct syndromes, viz: acute severe gastrointestinal disturbance and liver necrosis; and chronic, partial paralysis. The toxic principles of cycads are various azoxyglycosides which are converted to hepatotoxic and carcinogenic aglycones by intestinal bacteria.

Recently, a suspected case of cycad poisoning was referred to the Department of Pharmacology and Toxicology. Three Bull Terriers, a 3-year-old bitch and 2 of her offspring, uprooted and destroyed a potted, exotic cycad, subsequently identified as *Cycas revoluta* (Thunb.), the Japanese cycad or sago palm. The leaves were torn off and part of the stem of the cycad was ingested.

Within hours of ingestion, all 3 dogs vomited repeatedly, showed marked depression, severely congested mucous membranes, increased thirst and profuse salivation. In view of the known toxicity of the cycad family, it was decided to obtain blood samples from the dogs for haematological examination and serum chemistry and to monitor these parameters as well as their clinical appearance on a regular basis.

During the next few days habitus and colour of the mucous membranes returned to normal. However, serum alanine transaminase (ALT) activities and white blood cell counts (WCC) increased from Days 7 - 29 and from Day 0 respectively in all dogs. Immature neutrophils increased in all dogs, while a mild lymphocytopaenia and thrombocytopaenia occurred only in the female dogs.

The rise in serum ALT indicated possible liver necrosis and is consistent with that reported by others. The increases in the WCC with the neutrophil left shift may represent an inflammatory reaction and has also previously been reported.

The dogs subsequently made an apparently uneventful recovery.

EFFECTS OF DEHYDRATION AND REHYDRATION ON PLASMA VASOPRESSIN AND ALDOSTERONE LEVELS IN HORSES

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Changes in plasma vasopressin and aldosterone concentrations in desert-adapted (Namib) and control horses were investigated during an acute (12%) dehydration, followed by immediate rehydration.

During dehydration, vasopressin concentrations increased in both groups of horses, but the increase was significantly ($p < 0,05$) greater in Namib horses than in the control group. During rehydration, vasopressin levels declined, but less significantly so in the Namib horses. The change in vasopressin concentration correlated significantly with plasma osmolality ($r^2 = 0,88$; $p < 0,001$).

Aldosterone concentrations decreased during the first 48 h of dehydration in both groups of horses, significantly more so in the Namib horses. There was a significant increase in aldosterone concentration between 48 h and 72 h dehydration followed by a further significant increase on rehydration, in both groups. Increased aldosterone concentration on rehydration was sustained for longer in the Namib horses. Changes in plasma osmolality did not correlate significantly with changes in aldosterone concentration.

These results indicate that plasma vasopressin release was stimulated by, and that plasma aldosterone was suppressed by increased plasma osmolality. Previous studies showed a concurrent decrease in plasma potassium concentration with a 12% dehydration; this was possibly the most potent suppressor of aldosterone secretion. At 48 h dehydration, intravascular hypovolaemia was sufficient to override the suppressive effects of plasma electrolyte concentrations on aldosterone secretion, resulting in the increase seen between 48 h and 72 h dehydration.

Rehydration resulted in osmotic and aldosterone-mediated reabsorption of isotonic fluid across the gut epithelium. We conclude that osmotic forces, together with hormonal mechanisms influenced the movement of fluid across the gut and tubular epithelia in these horses, and that these roles have been developed to a greater degree in desert-adapted horses.

THE INTERMEDIATE HOSTS OF *TAENIA* spp INFESTING LIONS IN THE REPUBLIC OF SOUTH AFRICA

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In the Republic of South Africa, lions are commonly infested with 2 tapeworms, viz. *Taenia regis* Baer, 1923 and *Taenia gonyamai* Ortlepp, 1938. In an attempt to identify the intermediate hosts of these cestodes, a morphological investigation was carried out on cysticerci which occur in a variety of wild animals.

Cysticerci with rostellar hooks resembling those of *T. regis* have been found adhering to the mesentery or in the liver or lung of blue wildebeest, Burchell's zebra, sable antelope, waterbuck, gemsbok and warthog. The parasites are approximately 10mm in diameter and, on removal of the adventitious layer, the metacestode is about 40mm long by 5mm wide, with an invaginated scolex at one end. There are 40-49 rostellar hooks arranged in 2 crowns; the large hooks are 223-290 μm and the small ones 128-187 μm in length.

Cysticerci with rostellar hooks resembling those of *T. gonyamai* have been recovered from the muscles of impala, blue wildebeest, buffalo and kudu. Macroscopically these cysticerci resemble those of *Taenia saginata* in cattle, but they are armed with 32-40 rostellar hooks, of which the large are 183-218 μm and the small hooks 120-157 μm long. Such cysticerci from a blue wildebeest were fed to a lioness and gravid proglottids of *T. gonyamai* were found in her faeces 54 days later, thereby confirming the identification of the cysticerci.

The life cycle of *T. regis* has not yet been confirmed experimentally.

THE SEASONAL ABUNDANCE OF ORIBATID MITES ON AN IRRIGATED PASTURE

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The seasonal abundance of Oribatid mites, the intermediate host of Anoplocephalid cestodes, was studied on an irrigated pasture at the Veterinary Research Institute, Onderstepoort. Twice a month, soil and herbage samples were randomly collected two hours after sunrise, at midday and two hours before sunset from which mites were recovered in an autosegregator.

Although *Galumna rasilis*, *G. nuda*, *Tectocepheus sarekensis* and *Scheloribates elsi* were the most prevalent species and were consistently present throughout the study period, each displayed an individual seasonal distribution. In soil, *G. rasilis* was the most abundant during November, *G. nuda* in December and *T. sarekensis* in July, *S. elsi* appeared throughout the year but showed a weak peak in September. In the herbage all four species occurred in maximal numbers during January, while the numbers of *G. nuda* rose again in October.

During a dry period in November, only low numbers of mites were present on the herbage while the total number showed a peak in the soil. There were no differences in the total number of mites in the samples (herbage and in the first 5 cm of soil) collected at different times of day.

It is therefore concluded that environmental factors do influence the abundance of these mites, particularly on herbage, at different times of the year.

IDENTIFICATION OF SOME HAEMOPROTOZOA FROM LIONS

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Lions are known to harbour various protozoan parasites in their blood. The specific identification of some of these is problematical. Peripheral blood smears collected from 22 lions in the Kruger National Park were all found to harbour a small piroplasm in their erythrocytes, tentatively identified on morphological grounds as *Babesia felis*. One lion also harboured a large *Babesia* (possibly *B. pantherae*?) in the erythrocytes, while all lions were found to harbour gametocytes of a *Hepatozoon* sp. closely resembling *H. canis* in their neutrophils. Oocysts of *Hepatozoon* sp. were found in haemolymph smears of three *Rhipicephalus appendiculatus* adults, one *Amblyomma hebraeum* adult and one *A. marmoreum* nymph recovered from some of these lions. As no serological test was available, specific identification of the *Hepatozoon* couldn't be confirmed.

Serum specimens from all 22 lions and whole blood specimens from 8 lions were collected and stored frozen. A preliminary Indirect Fluorescent Antibody Test on the serum of 12 lions was negative for *B. felis*, indicating that the small piroplasm may not be *B. felis*, but probably a hitherto undescribed species. After inoculation with infected blood, a splenectomised cat developed a parasitaemia of 35%, but showed no overt clinical signs, a further indication that the species involved is probably not *B. felis*.

FLEA POPULATIONS ON SCRUB HARES (*Lepus saxatilis*) IN THE EASTERN TRANSVAAL LOWVELD AND THE EASTERN CAPE PROVINCE

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The aim of this study is to determine the prevalence and seasonal abundance of fleas on scrub hares.

At 2 localities in the eastern Transvaal Lowveld and 3 in the eastern Cape Province, 2-5 scrub hares were shot at monthly or 2-monthly intervals. After a 12 h soak in a tick-detaching agent, the carcass was thoroughly scrubbed with a steel brush to remove all ectoparasites for counting and identification.

Ctenocephalides felis damarensis was the most common flea recovered, with *Echidnophaga gallinacea* occurring sporadically. Peak numbers of *C. felis damarensis* were recovered from the hares at all localities in late winter and in spring.

The peak in the seasonal abundance of fleas on the scrub hares during spring indicates that conditions on the host or in the environment are optimal during that time of the year. As the hares breed throughout the year, there is no correlation between flea numbers and breeding activity.

ANTIBODY RESPONSE TO CANINE DISTEMPER VACCINE IN WILD DOGS

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Canine Distemper Virus (CDV) causes an acute to subacute systemic and/or neurologic disease in most species of canidae. The best method of preventing outbreaks of disease is vaccination.

There have, however, been cases of wild dog (*Lycaon pictus*) packs succumbing to clinical disease within weeks of vaccination with modified-live CDV. This has led to the preferential use of killed-virus vaccine for safety, although the immunogenic potential of this vaccine is limited.

The object of this study was to test the antibody response to the CDV subunit of a modified, live multivalent vaccine in adult wild dogs that had been vaccinated annually with same vaccine for several years.

Seven healthy, adult wild dogs held in captivity were vaccinated with a commercially available, modified-live CDV, adenovirus type 2, parainfluenza and canine parvovirus vaccine. Serum samples were collected at the time of vaccination and again one month later. Animals were observed for clinical signs of distemper. Antibody levels to CDV were measured by means of a commercially available, immunofluorescent antibody test.

Positive seroconversion in all the dogs in response to modified live canine distemper vaccination was demonstrated. No abnormal clinical signs were observed following vaccination.

THE EFFECTS OF A LONG-ACTING CORTICOSTEROID AND PROSTAGLANDIN F_{2α} ON LYMPHOCYTE BLAST TRANSFORMATION IN THE COW

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The level of antibody in the cow's serum is a major factor in determining the amount of antibody transmitted to the calf. Certain hormones, which are used to induce parturition in the cow, are known to depress immune responses *in vitro*. The objective of this study was to investigate the effect of two hormones currently used for lymphocyte blast transformation in the cow.

Samples for lymphocyte blast transformation assays were collected from one animal in each group prior to induction, immediately *post partum* (*pp*), and one and two months *pp*. Blastogenic responses to plant lectins (phaeohaemagglutinin and pokeweed mitogen) were assayed by conventional lymphocyte transformation techniques. The hormones included a long-acting corticosteroid and prostaglandin F_{2α}. Cows which calved naturally were used as controls.

There was no difference between the trends induced by the long-acting corticosteroid and natural calving, i.e. a decrease in blastogenesis immediately *pp*. Prostaglandin F_{2α} led to an increase in blastogenesis immediately *pp*. In conclusion, it would appear that these methods of induction have no deleterious effects on the immune system of the cow *in vivo*. It is therefore conceivable that the transfer of immunity to the calf is not negatively influenced by these procedures.

THE OCCURRENCE OF FELINE IMMUNODEFICIENCY VIRUS IN SOUTH AFRICA

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Feline immunodeficiency virus (FIV) was first isolated in the USA in 1986. Since then, the virus has been found to occur worldwide. FIV causes an AIDS syndrome in cats similar to that seen in humans. The objective of this study was to determine the prevalence of antibodies to FIV in South African felidae.

Antibodies were detected in serum samples using a commercially available kit which was suitable for use in domestic as well as non-domestic species. The study group consisted of healthy as well as sick felids from all four provinces of South Africa.

Of the animals tested, only 6% of healthy and 27% of ill, domestic cats, and 100% free-ranging and 48% captive lions had anti bodies to FIV. None of the lions showed clinical signs.

It can therefore be concluded that FIV occurs in South Africa.

DECLINE IN MATERNAL IMMUNITY AND VACCINE RESPONSE IN CHEETAH CUBS

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Studies on the transfer and decline of maternal immunity have been carried out on the domestic cat (*Felis domesticus*) by numerous workers. It was shown that the level of specific antibody in maternal serum is a major factor in determining the amount of antibody transmitted to the kittens. No similar studies have been done on non-domestic species and data from domestic cats has been assumed to reflect the situation in non-domestic felids.

As the time of effective vaccination depends on the disappearance of maternally derived immunity, it is of critical importance to know when this occurs so that the most effective vaccination programme may be carried out.

The purpose of the study was to document the decline of maternally derived antibodies and the response to vaccination in captive cheetah (*Acinonyx jubatus*) cubs.

Ten cubs were bled every two weeks from 4 weeks until 12 weeks of age. The mothers were bled at the same time. By 10 weeks litter 1 had 50% of the original antibodies left. Litters 2 and 3 showed stable antibody levels to panleukopenia and herpes but had steadily decreasing levels to calicivirus; by 10 weeks litter 2 had 74% of the original antibodies left and litter 3 had 55%. These 10 cubs were also bled at the time of vaccination with modified-live vaccine and again one month later. Antibody levels were seen to increase by at least 18% in all three litters. Another three cubs were bled prior to vaccination (at 12 weeks of age) with inactivated panleukopenia vaccine and again one month later. There was no increase in antibody levels. These cubs were then vaccinated with modified-live multivalent vaccine and re-bled one month later. The antibody levels to panleukopenia were seen to decrease but there was positive seroconversion to herpes and calicivirus.

EXPERIMENTAL REPRODUCTION OF PHYTOBEZOARS

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Abomasal phytobezoars in sheep and goats are often a mere curiosity, but in some circumstances they assume major importance and can lead to devastating losses due to obstruction to the flow of ingesta. One such type of phytobezoar has been identified in the arid Karoo of the Cape Province. Field observations and the physical and chemical investigation of these bezoars had indicated that they were formed by the aggregation of plant fibres which closely corresponded to pappus hairs surrounding the seeds of certain Karoo bushes.

It was decided to attempt the artificial production of structures resembling the abomasal phytobezoars found in nature. A wool felting apparatus was used and the effect of the following parameters was standardised: temperature, fibre water content, shaking speeds, containers and position of containers. The following parameters were varied to test the effect of each on the formation of bezoar-like structures: mass of seeds and pappus hairs, volume of liquid, pH of liquid, mass to volume ratio, milling of plant material, time of shaking, and individual or mixtures of plant material.

In a series of 4 experiments using the flowers or seeds of the Karoo bushes *Chrysocoma tenuifolia*, *Dimorphotheca cuneata*, *Eriocephalus glaber*, *Gazania oxyloba* and *Gnidia polycephala*, small phytobezoars were formed from material of *E. glaber*, *G. oxyloba* and *G. polycephala* either alone or in various combinations. The ratio of fibre to liquid used was found to be optimal around 1: 7 and milling material enhanced the formation of bezoars while pH and time did not appear to affect the outcome significantly. In a small *in vivo* trial using 4 sheep and 4 goats, 10% of either *C. tenuifolia*, *E. glaber* or *G. polycephala* seeds was added to basal diet of milled lucerne fed for up to 31d to 3 groups comprising 1 sheep and 1 goat each, while group 4 was fed milled lucerne only. Small phytobezoars were formed in the goats but not the sheep receiving *C. tenuifolia* and *G. polycephala*. It was concluded that phytobezoars could form in goats or sheep eating large quantities of the pappus hairs of several Karoo bushes.

PEMPHIGUS FOLIACEUS IN A HORSE

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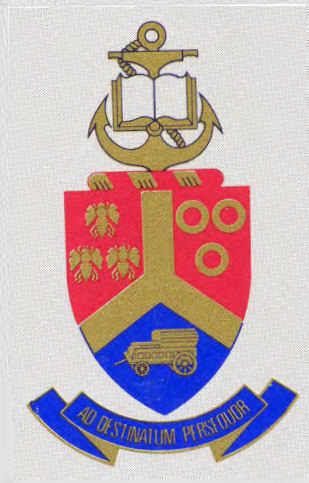
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A 3-year-old Thoroughbred horse was admitted to the Equine Clinic for routine follow-up examination, about 4 months after laryngoplasty surgery. The horse had lost weight and was depressed. Severe ventral, limb and preputial oedema was present, as well as extensive skin lesions which included diffuse scaling and alopecia.

Clinical pathology showed a leukocytosis, neutrophilia with a left shift and hypergammaglobulinemia, without hypoalbuminemia. Skin scrapings, bacterial and fungal cultures were negative.

On routine histopathology, subcorneal pustules with typical acantholytic cells were present, indicating pemphigus foliaceus. Specific anti-IgG direct immunofluorescence testing showed typical intercellular deposition of IgG in the sub-corneal area, confirming a diagnosis of pemphigus foliaceus.

Treatment with a combination of prednisolone and myocrisin was initiated, and within 2 weeks the oedema, alopecia and scaling decreased and new hair began to grow.



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