



UNIVERSITEIT VAN PRETORIA
Fakulteit Veeartsenykunde
Faculty of Veterinary Science

PROGRAM EN OPSOMMINGS
PROGRAMME AND SUMMARIES

3de Fakulteitsdag
3rd Faculty day
1 October 1986





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IIIrd FACULTY DAY

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LARGE AUDITORIUM

Faculty of Veterinary Science

University of Pretoria

1 October 1986

Sponsored by Coopers Animal Health (Pty) Ltd

Organising Committee

Prof J M W le Roux	-	Dean
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Dr A J M Verster	-	Research Committee
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FAKULTEITSDAGPROGRAM 1986

- 08h00 - 08h30 Ontvangs van gaste
- 08h30 - 08h40 Verwelkoming Prof J M W le Roux
Dekaan
Fakulteit Veeartsenykunde
- 08h40 - 09h00 Opening Address Prof C M Veary
Past President : S A V A
- 09h00 - 10h00 SIR ARNOLD THEILER- Prof B C Jansen
GEDENKLESING Voormalige Dekaan en
Direkteur, N I V.
- 10h00 - 10h20 TEA/TEE
- 10h20 - 10h30 Toekenning: Dosent van die Jaar. *Piet Botha.*

WETENSKAPLIKE PROGRAM / SCIENTIFIC PROGRAMME

SESSIE I PARASITOLOGIE / BAKTERIOLOGIE VOORSITTER: Prof L W van den Heever

- 10h30 - 10h45 1. A million or more to one : are anthelmintics on their way out?
R K Reinecke
- 10h45 - 11h00 2. Vaccination of sheep against the larval stage of Taenia multiceps.
Anna Verster & R C Tustin
- 11h00 - 11h15 3. The epidemiology, ecology and economic significance of leptospirosis in a pig herd.
G V Turner, B Gummow, M A Witcomb & J F de Lange
- 11h15 - 11h30 4. The role teat canal infections play when comparing various criteria for determining the health status of the bovine udder.
J H du Preez

SESSION II COMPANION ANIMALS
CHAIRMAN : Prof D G Steyn

- 11h30 - 11h45 5. Adverse effects from the use of resuscitative fluids for maintenance infusion in the dog.
P Bland-van den Berg & J Wysoke
- 11h45 - 12h00 6. Dental trauma caused by screws in internal fixation of mandibular osteotomies in the dog.
F J M Verstraete & A J Ligthelm
- 12h00 - 12h15 7. Vergelyking tussen 'n gemodifiseerde paraskeletale klouplaatjie en 'n half Kirschner-fiksator in dwars tibiaskag-frakture by die hond.
G L Coetzee
- 12h15 - 12h30 8. The human/animal bond in the consultation room.
J S J Odendaal & A Weyers

SESSIE III ANATOMIE
VOORSITTER: Prof M M S Smuts

- 12h30 - 12h45 9. Die effek van mid-servikale vagotomie op die kraniale kardiese senuwee van die volstruis.
A J Bezuidenhout
- 12h45-13h00 10. Some ultrastructural features of cilia in definitive primitive streak-stage chick embryos.
J T Soley

MIDDAGETE / LUNCH

SESSION IV REPRODUCTION
CHAIRMAN: Prof R I Coubrough

- 13h45 - 14h00 11. Spermatogenese in die klein geel dakvlermuis Scotophilus borbonicus (E. Geoffroy, 1803).
N J van der Merwe

- 14h00 - 14h15 12. Reproductive seasonality in male
tsessebe Damaliscus lunatus.
B L Penzhörn & E E Oettlé
- 14h15 - 14h30 13. Synchronization of mares for AI
with frozen semen.
D H Volkmann, H J Bertschinger &
D van Zyl
- 14h30 - 14h45 14. The effect of endotoxin on luteal
function in the cow.
R O Gilbert, W T K Bosu & A T Peter
- 14h45 - 15h00 15. Steroid immunization of ewes to
increase fecundity.
S J Terblanche, I Herbst, M van Tonder
& A du Plessis

SESSIE V PATOLOGIE
VOORSITTER: Prof R C Tustin

- 15h00 - 15h15 16. An outbreak of Salinomycin toxicity
in sheep.
S S Bastianello
- 15h15 - 15h30 17. Renal pathology in Canine Ehrlichiosis:
a light and transmission electron
microscopic study.
J W Nesbit
- 15h30 - 15h45 18. Pathology of encephalomyocarditis
virus infection in pigs.
M C Williams
- 15h45 - 16h00 19. Nutritional osteodystrophia
fibrosa in a lion cub.
I B J van Rensburg

16h00 - 16h15 POUSE

SESSION VI PHARMACOLOGY / PHYSIOLOGY
CHAIRMAN: Prof T W Naude

- 16h15 - 16h30 20. The effect of age on the absorption and
disposition of orally administered
halogenated Salicylanilides in the
ruminant.
G E Swan & M S G Mülders

- 16h30 - 16h45 21. A study on selected blood parameters
 in cage-restricted Canaan dogs.
 J C Sneddon, P P Minnaar, J J van
 Rensburg & J F W Grosskopf
- 16h45 - 17h00 22. The effect of a standard exercise test
 on certain physiological and biochemical
 parameters in trained endurance horses.
 A J Guthrie, V M Killeen, A Littlejohn
 & J F W Grosskopf
- 17h00-17h15 23. Bloedgegewens van honde voor en na
 oefening op 'n trapmeul.
 J H Malan, J F W Grosskopf,
 J - J van Rensburg, P Minnaar &
 D Lombard

17h15 AFSLUITING: Prof J M W le Roux

A MILLION OR MORE TO ONE:
ARE ANTHELMINTICS ON THEIR WAY OUT?

R K REINECKE

Department of Parasitology, Faculty of Veterinary Science
University of Pretoria

An attempt was made in a field trial to protect sheep against challenge with Haemonchus contortus. Every 7 days during the trial differential sheep worm egg counts were done. Groups of sheep were predosed with Trichostrongylus axei in Spring 1976. Every 8 weeks 12 predosed sheep and a similar group of controls were removed from pasture, killed and differential worm counts done.

After 220 days, 4 649 362 622 eggs were disseminated on 17 ha of grazing. Controls killed at this time had worm burdens of H. contortus ranging from 2 389 - 18 307 worms, representing $\frac{0,0000005}{0,0000039}$ of the total worms on the pasture. Anthelmintics therefore are treating a minute fraction of worms in the flock, in the forlorn hope that they will be destroyed.

In February 1985 the CSIRO Division of Animal Health, Australia, held a 2 day symposium entitled "Resistance in nematodes to anthelmintic drugs" at which 16 papers were present. Resistance, particularly of H. contortus and to a lesser extent, of Trichostrongylus spp. and Ostertagia spp., to certain anthelmintics, particularly the benzimidazoles, is a source of grave concern. Different dosing strategies are proposed: e.g. sustained release devices, potentiating benzimidazoles with levamisole, using nematode growth regulators, etc.

A major effort is required to solve this problem.

VACCINATION OF SHEEP AGAINST THE LARVAL STAGE OF Taenia multiceps

ANNA VERSTER* and R.C. TUSTIN**

Departments of Parasitology* and Pathology**
Faculty of Veterinary Science, University of Pretoria.

In a preliminary trial, sheep were vaccinated with Oncosphere Secretary Antigen (OSA) prepared from the ova of Taenia multiceps and subsequently these, as well as untreated controls, were dosed with ova of T. multiceps. At necropsy 5 out of 33 vaccinated sheep had cerebral lesions while 11 out of 14 untreated controls had such lesions.

A subsequent trial was undertaken to determine the age at which lambs should be vaccinated and whether there was passive transfer of immunity to the lambs. A flock of 200 Merino and Merino-cross ewes were flushed to synchronize their oestrus cycles and then mated. The ewes were divided into 2 groups and those in one group were vaccinated 60 and again 30 days before they were due to lamb. The treatment of the ewes and their lambs is summarized in the following Table.

EXPERIMENTAL DESIGN: TREATMENT OF EWES AND LAMBS

EWES	GROUP	A (VACCINATES)			C (UNVACCINATED)		
	OSA*	80.12.23			-		
OSA*	81.01.21			-			
LAMBS	GROUP	A1	A2	A3	C1	C2	C3
	NO. OF ANIMALS**	26	28	25	26	25	25
	OSA*	81.04.09	81.06.10	-	81.04.09	81.06.10	-
	OSA*	81.05.08	81.07.10	-	81.05.08	81.07.10	-
	CHALLENGE	81.08.25 4 600 <u>T. multiceps</u> ova per os.					
NECROPSY	81.11.16 - 81.12.01						

* Oncosphere Secretary Antigen.

** Number of animals in each group at the time of vaccination.

Of the vaccinated lambs 4 out of 85 (4,7%) and the untreated lambs 22 out of 42 (52,3%) had cerebral lesions.

Vaccination of the lambs at 1 (Group A1, C1) or at 3 (Group A2, C2) months was equally effective in protecting them against infestation. The lambs of vaccinated ewes (Group A3) were as susceptible to infestation as those of the untreated ewes (Group C3).

These results show that OSA protects sheep against cerebral coenuriasis but 3 aspects need further attention. Firstly, the vaccine should be tested under field conditions. Trials were initiated on 3 farms in Mossel Bay and 2 in Middelburg, Cape, but due to floods and/or lack of co-operation, no reliable data on the efficacy was obtained. Further attempts should be made to ascertain whether there is colostral transfer of immunity and finally, the effect of the administration of vaccine on an existing infestation must be determined.

THE EPIDEMIOLOGY, ECOLOGY AND ECONOMIC SIGNIFICANCE
OF LEPTOSPIROSIS IN A PIG HERD

G V TURNER*, B GUMMOW**, M A WITCOMB* and J F DE LANGE **

*Department of Infectious Diseases,
Faculty of Veterinary Science, University of Pretoria

** Veterinary Research Institute, Onderstepoort

Leptospirosis is an economically important zoonotic disease affecting most mammals throughout the world. The epidemiology of leptospirosis is complex and because of its multi-host nature, the persistence of the disease within any population is usually associated with an intricate ecosystem. Leptospirosis is an important cause of reproductive disease in swine. Very little research has been directed towards the disease in the Republic of South Africa. Recently an abortion storm occurred in a pig herd in the Bethal district. An epidemiological investigation was conducted in order to determine the extent and significance of the disease in the pigs and other species of animals on the farm.

Sows that aborted were tested serologically and bacteriologically for leptospirosis. Sera from 170 cattle, 153 sheep, 13 horses, 4 mice and 2 dogs were tested for leptospiral antibodies by means of the microscopic agglutination test. Samples from the pig effluent dam, mud and a nearby river were examined for the presence of leptospire. It was shown that Leptospira interrogans serovar pomona caused the abortion storm in the sows. Sera positive to serovar pomona were found in 100%, 52%, 39% and 1,3% of the dogs, cattle, horses and sheep respectively. Leptospire were demonstrated in samples taken from the effluent dam and the river.

It appeared that gilts introduced from the Cape Province were the initial source of the infection. It was shown that leptospirosis can spread rapidly through a pig herd with serious economic loss as a result of abortions in the breeding herd. Contamination of the environment with leptospire and the concomitant infection of other species of animals in the vicinity of an infected pig herd can easily occur. Such a situation can play an important role in maintaining the infection on a farm and these multiple factors should be considered when instigating preventive measures during an outbreak of leptospirosis.

THE ROLE TEAT CANAL INFECTIONS PLAY WHEN COMPARING
VARIOUS CRITERIA FOR DETERMINING THE HEALTH STATUS
OF THE BOVINE UDDER

J H DU PREEZ

Department of Veterinary Public Health,
Faculty of Veterinary Science, University of Pretoria

Research on the role teat canal infections play when comparing various criteria for determining the health status of the lactating bovine udder revealed the following:

Exclusive use of the cytobacteriological status of foremilk in the International Dairy Federation's (IDF) criteria for classification of subclinical udder conditions does not provide a true picture of the health status of the udder. Up to 16% of quarters classified as normal or 10% as cases of aseptic mastitis according to the IDF criteria in fact have teat canal infection (TCI). TCI may result in damage to the udder parenchyma as manifested by the elevated bovine serum albumin (BSA) content of milk. Since classification of the health status of quarters according to the IDF criteria and with due regard to the BSA values of milk did not include the bacteriological results of the teat canal swab sample, further research must be done to clarify the existence of conditions such as relevant teat canal infection, irrelevant teat canal infection, unspecific hyperalbumingalactia, specific hyperalbumingalactia and unspecific cellular reaction.

ADVERSE EFFECTS FROM THE USE OF RESUSCITATIVE FLUIDS FOR
MAINTENANCE INFUSIONS IN THE DOG

P BLAND-VAN DEN BERG and J WYSOKE

Department of Medicine, Faculty of Veterinary Science,
University of Pretoria

Polyuria following the use of resuscitation type fluids (Plasmalyte B, Ringers Lactate) for maintenance fluid therapy in anorectic and adipsic dogs was observed clinically. It was hypothesized that the electrolyte composition of these fluids was not suited to continuous long-term fluid infusion of the dog.

A trial was designed, using healthy mongrel (2) and Canaan (3) bitches each acting as its own control. Two consecutive morning sets of clinical, haematological, biochemical and urinary base-line values on standard diet and ad lib water were obtained for each dog. Electrolyte fractional clearances, 24 hour creatinine clearances of osmols and free water were calculated from these values. Fluid therapy with Plasmalyte B was then initiated (time zero). Repeat measurements of the set of parameters were made after 24, 48 and 72 hours of fluid therapy, after which the trial was terminated.

Results indicated that a massive, potentially dangerous solute (sodium, chloride, bicarbonate) diuresis had occurred during the period of fluid therapy. It was also apparent that the fluid had inadequate quantities of potassium, magnesium and phosphate necessary for maintenance. An increased FC of calcium was attributed to reduced renal tubular reabsorption of Ca in the presence of excess filtered sodium ions, and was not due to excessive quantities of Ca in the drip fluid.

The hypothesis that resuscitation type fluids are unsuitable for maintenance fluid therapy in dogs was therefore supported. The implications for maintenance fluid therapy in dogs in general, especially for those unable to compensate for the incorrect choice of fluid by drinking additional quantities of water, or for those with impaired renal function or severe potassium loss, are enormous. Further in depth study is essential.

DENTAL TRAUMA CAUSED BY SCREWS IN INTERNAL
FIXATION OF MANDIBULAR OSTEOTOMIES IN THE DOG

F J M VERSTRAETE* and A J LIGTHELM**

* Department of Surgery, Faculty of Veterinary Science and

** Department of Oral Pathology and Oral Biology, Faculty of
Dentistry, University of Pretoria

The use of plate and screws for internal fixation of mandibular fractures in the dog is an accepted technique in clinical practice, although very little experimental work has been done in this respect. The implantation of screws in the body of the mandible would appear to be difficult to perform without causing damage to the important structures situated within the mandible, because of the morphology of this bone.

A transverse osteotomy of the left mandible was performed on 15 adult mongrel dogs and was repaired with plate and screws using accepted techniques. The plate was situated on the dorsal half of the mandible because this position is preferable from a biomechanical point of view. After three months the dogs were sacrificed and the amount of dental trauma was determined clinically and histologically.

Erosion of the gingiva overlying the plate occurred in the majority of dogs, thereby exposing the plate. Severe generalized periodontitis and horizontal bone loss were evidence in some cases.

Many dental roots were damaged by the screws and on histological examination a variety of lesions was noted. Root perforation causing pulpal damage resulted in lesions varying from mild irritation to pulpal necrosis, with associated periapical lesions. Where the screws were in contact with the root cementum, dentine resorption occurred in combination with the formation of secondary cementum. Periodontal damage also varied and complete destruction with bony ankylosis was noted. An acute inflammatory reaction of the gingiva and underlying soft tissue was seen in conjunction with oral exposure of the screwheads. This extended in some cases into the alveolar bone surrounding the proximal part of the screw hole causing bone resorption and in some cases even osteomyelitis.

In conclusion it would appear that plate and screws fixation of fractures of the body of the mandible, with positioning of the plate on the dorsal half of the mandible, is not indicated, because of the high incidence of damage to the dental roots and erosion of the gingiva overlying the plate.

VERGELYKING TUSSEN 'n GEMODIFISEERDE PARASKELETALE
KLOUPLAATJIE EN 'n HALF KIRSCHNER-FIKSATOR IN
DWARS TIBIASKAGFRAKTURE BY DIE HOND

G L COETZEE

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Universiteit van Pretoria

Kleiner honderasse (4-18 kg) ontwikkel dikwels komplikasies met distale tibiale diafisefrakture weens hulle opgewonde geartheid.

Benewens 'n intramedullêre Steinmannpen vir aksiale stabilisasie is 'n gemodifiseerde Mennenklamp by linker tibiale osteotomies van 6 Beagle-honde gebruik, terwyl 'n half Kirschner-fiksator in 3 Beagle-honde gebruik is. Soortgelyke operasies is 12 weke later op die regter tibiae van die honde uitgevoer. Geen eksterne fiksasie is aangewend nie, sodat die osteotomies aan maksimale rotasie-, skeur- en buigkragte blootgestel is. Die honde is 16 weke na-operatief opgeoffer.

Waar 'n gemodifiseerde Mennenklamp gebruik is, kon die honde 12-14 dae na-operatief weer redelik goed gewig op die betrokke agterbeen dra; hulle was 28-35 dae na-operatief weer klinies normaal. Waar die half Kirschner-fiksator gebruik is, kon die honde na 18-24 dae weer redelik gewig dra op die betrokke agterbeen, maar was vir 6-7 weke mank; komplikasies soos sagteweefselswelling en pensypeling het voorgekom.

Met radiologiese ondersoek kon periosteale benige kallus 3 weke na-operatief by albei fiksasietegniese waargeneem word, maar kallusvorming was meer beperk tot die fraktuurlyn self indien die Mennenklamp bo-oor die periosteum aangewend was. Indien die Mennenklamp sub-periosteaal vasgeklem was, het daar kallus tussen en bo-oor die vingers van die klouplaatjie gevorm wat in een geval tot 10 weke geneem het voordat die benige kallus die osteotomielyn oorbrug het.

Histologiese ondersoek het getoon dat daar 4 weke na-operatief nog kraakbeen in die osteotomielyn was, maar dat beenresorpsie afwesig was by die fragmentpunte, wat daarop dui dat stewige interne fiksasie met die Mennenklamp verkry is. Geweefde en gelamelleerde been het in beide fiksasiemetodes teen die bestaande kompakte been gevorm, maar het die osteotomielyn net aan die endosteale kant oorbrug.

Uit die navorsingsresultate kan die gevolgtrekking gemaak word dat die gemodifiseerde Mennenklamp rotasiekragte effektief kan teenwerk sodat sekondêre fraktuurgenesing kan plaasvind.

THE HUMAN/ANIMAL BOND IN THE CONSULTATION ROOM

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The objective of this study was to categorise the visits of clients to veterinarians, in order to understand and exploit the importance of the human/animal contact in the consultation room.

A questionnaire, based on 14 years' private practice experience and psychological principles, was compiled in collaboration with the University of the Orange Free State. Questionnaires were sent to veterinarians all over the country. Clients visiting veterinarians were requested to complete the questionnaires and 612 were returned. The data was processed by computer.

Although there are several reasons why clients visit veterinarians, most can be divided into two main categories. These categories are connected with the basic needs of man for companion animals. Firstly, there is modern man's broken link with nature, because of urbanization. Companion animals are kept to establish a link and to regain contact with nature. Part of this process will be the routine care of the animals, and also the use of animals for protection and services. Visits to the veterinarian will therefore be aimed at the treatment of obvious diseases and traumas. Secondly, twentieth century man has a need for stress release, arising from his modern lifestyle. Companion animals play an important role as tension-releasing objects. This includes pet clubs for recreation as well as the pet at home. Visits to the veterinarian will therefore be part of the clients' use of their pets in this respect. Companion animals can often fulfil the needs of service and tension release, so that a client's visit to a veterinarian could fall in both categories.

If the veterinarian can interpret the client's visit, he may become more productive and render a better community service. The analysis of the questionnaires supports this theory, and the application thereof in private practice appears to be valuable.

DIE EFFEK VAN MID-SERVIKALE VAGOTOMIE OP DIE
KRANIALE KARDIESE SENUWEE VAN DIE VOLSTRUIS

A J BEZUIDENHOUT

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Die kraniale kardiëse senuwee is 'n tak van die vagus senuwee wat hoofsaaklik die bloedvate van die hart voorsien. Die senuwee bestaan uit gemedulleerde en ongemedulleerde vesels wat in duidelike bondels, bestaande uit beide tipes vesels, gerangskik is. Die effek van mid-servikale vagotomie op die linker kraniale kardiëse senuwee is lig- en elektronmikroskopies ondersoek 2, 7, 65, 180 en 373 dae na deursnyding van die linker vagus senuwee.

Twee dae na deursnyding het sommige van die gemedulleerde en nie-gemedulleerde vesels tekens van degenerasie getoon, terwyl ander geen veranderinge getoon het nie. Degenerasie is gekenmerk aan krimpings en vakuolisasie van die aksone en myelienskede. Sewe dae na deursnyding was degenerasie baie uitgesproke, met vakuolisasie en opbreking van die myelienskede en aksone van geaffekteerde vesels, terwyl Schwannselkerne piknoties geword het. Na 65 dae het toenemende getalle vesels degenerasie getoon. Schwannselkerne was steeds piknoties. Teen 180 dae was individuele senubondels nie meer identifiseerbaar nie. Gemedulleerde vesels het baie gevarieer in grootte, vorm en dikte van die myelienskede; die meeste was omring deur 'n dik, homogeen endoneurium. Meeste van die Schwannselkerne het steeds piknoties voorgekom. Sommige gemedulleerde en nie-gemedulleerde vesels was normaal in voorkoms. Teen 373 dae na deursnyding het die oorblywende gemedulleerde en nie-gemedulleerde vesels en Schwannselkerne normaal vertoon. Meeste van die vesels teenwoordig in die senuwee was nie-gemedulleerde vesels.

In teenstelling met die bevindinge in die hoender deur ander navorsers, het al die senuvesels van die kraniale kardiëse senuwee nie gedegeneer na midservikale vagotomie nie. Dit dui op 'n addisionele bron van vesels, waarskynlik van simpatiese oorsprong.

SOME ULTRASTRUCTURAL FEATURES OF CILIA IN
DEFINITIVE PRIMITIVE STREAK-STAGE CHICK EMBRYOS

JOHN T SOLEY

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University of Pretoria

Several authors have recorded the presence of cilia on the apical surface of epiblast cells in the early chick embryo. This paper reports on the morphological features of cilia observed on epiblast and mesenchymal cells during an ultrastructural investigation of primitive streak formation in the chick embryo.

Cilia were identified on the apical surface of epiblast cells and were also observed to protrude from mesenchymal cells and occasionally from hypoblast cells. The cilia appeared in two forms - those emanating from the cell surface, and those arising from pit-like depressions in the ectoplasm of the cell. Although differing in the mode of projection from the cell, the cilia displayed similar structural characteristics. The most prominent feature was the presence of a pair of centrioles situated in the cytoplasm immediately beneath the cilium and aligned along the ciliary axis. The more superficially positioned (cilium-forming) centriole appeared to be longer and more strongly developed than the proximal centriole, and displayed electron-dense accumulations associated with the outer centriolar wall. This satellite material was often linked to cytoplasmic microtubules. Microtubules originating from the walls of the centriole were seen to project into the ciliary shaft and appeared, in the material studied, to adopt a 9 + 0 configuration. A plate of dense material was positioned at the distal end of the centriole and small vesicles were sometimes observed within the centriole and the ciliary shaft. Developing cilia, covered by a definite sheath, were also encountered deep within the cell cytoplasm.

These findings confirm the presence of cilia in DPS-stage chick embryos. The observation that cilia project from the cell surface in two different ways supports the view that the mode of cilia formation depends on the location of the centrioles within the cell.

SPERMATOGENESE IN DIE KLEIN GEEL DAKVLERMUIS
SCOTOPHILUS BORBONICUS (E. GEOFFROY, 1803)

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Universiteit van Pretoria

Oor 'n tydperk van 'n jaar is gereelde maandelikse versamelings van testes van S. borbonicus gemaak en sneë is voorberei vir ligmikroskopiese ondersoek.

In die winter bestaan die kiemepiteel van die tubuli seminiferi contorti uit Sertoli-selle met enkele spermatogonia. Spermatogenese vind dan so geleidelik plaas dat in sekere maande net sekere spermatogene selle in die saadbuis voorkom. Volwasse sperme is teen die einde Maart en begin April teenwoordig. Die hele proses vind dus oor 'n tydperk van agt maande (September - April) plaas.

Die aktiwiteit van die saadbuisies korreleer dan ook met die deursnit van die saadbuisies. Daar is 'n geleidelike toename in die deursnit van die saadbuisies vanaf September tot 'n maksimum waarde teen April. Teen die einde van Mei is daar 'n dramatiese afname in die deursnit en het die saadbuisies dan ook 'n prepubertale voorkoms.

Die testis van hierdie spesie is dus uiters geskik vir die studie van spermatogenese.

REPRODUCTIVE SEASONALITY IN MALE TSESSEBE DAMALISCUS LUNATUS

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Faculty of Veterinary Science, University of Pretoria.

Tsessebe are distinctly seasonal breeders; rutting takes place in late summer/autumn (March - April) and calves are born in the early summer. An opportunity arose to investigate seasonal histological changes in the male reproductive organs when a parasite survey of tsessebe in Nylsvlei Nature Reserve, Central Transvaal, was carried out. Twelve tsessebe males were available; two were collected every second month from May 1985 to March 1986. The testes were weighed, measured and the volume determined. The following specimens were preserved in buffered formalin: testes, epididymes (caput, corpus and cauda), seminal vesicles and ampullae. Epididymal semen was diluted in sodium citrate solution; smears were made and fixed for subsequent Spermac staining.

Histologically, the following parameters were assessed: diameter of seminiferous tubules, sperm storage in epididymes and secretion of seminal vesicles.

A number of sperm abnormalities were encountered; all have been described from other species.

SYNCHRONIZATION OF MARES FOR AI WITH FROZEN SEMEN

D H VOLKMANN, H J BERTSCHINGER and D VAN ZYL

Department of Genesiology, Faculty of Veterinary Science,
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In 1985 we reported on the artificial insemination results using frozen semen in mares during their natural oestrus. Very satisfactory first and second cycle pregnancy rates of 59% and 82% respectively were achieved. For the 22 mares daily veterinary attendance was required for 4 months in order to attain these results. To concentrate the veterinary effort during a frozen semen AI programme 3 groups of mares, A, B and C, were synchronised by injecting each mare with a daily dose of 150 mg progesterone and 10 mg oestradiol-17 β in oil i.m. for 10 days. A single dose of 5 mg PGF₂ α was given on Day 10.

Group A mares (n = 15) were synchronised in September, Group B mares (n = 18) in January and Group C mares (n = 15) in April of the 1985/86 season. Mares were teased daily. Anticipated ovulation was determined by daily rectal palpations during oestrus. Follicular size and the degree of fluctuation were used to predict imminent ovulation. At this stage the first insemination was carried out. The inseminations were repeated every 2 days until ovulation had occurred. Only one mare in each group did not respond with a synchronised oestrus by Day 15 post treatment. In each of Groups A and C one mare that had shown oestrus failed to ovulate. Overall 43 of 48 mares ovulated 10 to 21 days post treatment. Mean days from last treatment to onset of oestrus and ovulation were 9,0 and 16,2; 10,4 and 14,2; and 9,1 and 13,1 for Groups A, B and C respectively. There was a decrease in number of days from last treatment to ovulation as the season progressed (P<0,005). Duration of oestrus also decreased from 8,2 (A) to 4,7 days (B,C) (P<0,005). Oestrus symptoms varied from outspoken (A), to moderate (B), and poor (C) in the 3 groups (P<0,1). Although statistically not significantly different conception rates varied from 64% (A) to 46% (B) to 50% (C), with an overall mean of 54%. The overall mean was slightly lower than the 59% obtained in mares inseminated during their natural oestrus in 1984/85 (P>0,35). Pooling the results of both seasons showed that conception rates of 54% and 50% were obtained in mares inseminated 1-23 and 24-47 h before ovulation respectively.

THE EFFECT OF ENDOTOXIN ON LUTEAL FUNCTION IN THE COW

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This trial was undertaken in order to elucidate the possible effect of endotoxin on luteal function in cows. On day 7, 8 or 9 of the oestrous cycle, four groups of four to six Holstein heifers received either: Group I: intrauterine infusion of sterile culture medium; Group II: intrauterine infusion of *E. coli* endotoxin (5 µg/kg) in sterile culture medium; Group III: intrauterine administration of 10 ml of a 24 hour culture of a strain of *E. coli* isolated from the uterus of a cow with a purulent discharge (approximately 10^9 colony forming units / ml); Group IV: intravenous administration of *E. coli* endotoxin in sterile saline (5 µg/kg). Blood samples were collected every 48 hours during the pretreatment, treatment and posttreatment oestrous cycles. Following treatment, samples were collected every 4 hours for 5 days. Sera were assayed for concentrations of progesterone and 15-keto-13, 14-dihydroprostaglandin F_{2α} (PGFM). Cycle length and duration of the luteal phase in the treatment cycle were shortened only in Group III. Intravenous administration of endotoxin (Group IV) provoked an acute increase in progesterone concentrations within 4 hours, followed by a significant decrease at 12 and 16 hours, after which luteal function apparently recovered in all but one animal. Acute increases in PGFM concentrations coincided with progesterone peaks. These results suggest that intravenous administration of a single dose of endotoxin has an acute effect on luteal function in the cow, potentially mediated by activation of prostaglandin synthesis or release. The lack of response in the group receiving intrauterine administration of endotoxin may reflect failure of absorption of endotoxin from the normal, cycling endometrium. It is clear, however, that systemic endotoxin does affect luteal function, and endotoxin-induced luteolysis may be a significant factor in the pathogenesis of early bovine abortion ascribed to an extrauterine septic focus.

STEROID IMMUNIZATION OF EWES TO INCREASE FECUNDITY

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Immunization against androstenedione and other ovarian steroids has led to an increase in ovulation rate. The vaccinated ewes show increased concentrations of luteinizing hormone (LH) and an increased pulsatile release of LH. The ovaries of vaccinated ewes are heavier than ovaries of untreated ewes while progesterone and 17 beta-oestradiol concentrations are increased during the luteal and peri-ovulatory phase respectively.

During 1983 Fecundin (Polyandroalbumin - an immunogen; Milvet) trials were conducted on 11 commercial properties in RSA. Two injections 4 weeks apart were given and the rams were joined with the ewes 14 to 21 days after the last or booster injection. All ewes selected for treatment had to weigh at least 45 kg and the lambing percentage of Merinos had to be 90-130%. Each trial consisted of vaccinated and control ewes run in the same flock. Results from 6 farms that met all the above criteria are discussed in this presentation.

The lambing percentage in the treated ewes showed a mean increase of 21% (range: 9-50%) over the control group. Three farms presented weaning records; due to high mortality of lambs from multiple births, the treated ewes weaned only 10% more lambs than the control animals. These results were achieved during a drought year.

Fecundin has a part to play in improving fecundity of South African ewes, providing suitable managerial steps are taken to raise the extra twins born.

AN OUTBREAK OF SALINOMYCIN TOXICITY IN SHEEP

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High mortality associated with the incorporation of salinomycin at the rate of 16,8 ppm was recorded in a group of 17 sheep. Six (36%) of these sheep died suddenly without showing any prior clinical signs 5-6 days after the commencement of salinomycin addition to the feed. Four (24%) were euthanased in extremis following a clinical course of progressive paresis over a period of 3-5 days. Although the remaining 40% showed varying degrees of ataxia, they survived after cessation of salinomycin incorporation in the feed on the seventh day. The paresis was characterised by hindquarter ataxia, a stumbling gait, sternal recumbency and terminally lateral recumbency. A significant number also showed torticollis.

At post-mortem myocardial lesions characterised by endocardial and in particular epicardial mottling, accompanied by lesions attributable to acute heart failure were present in most cases. Small focal areas of skeletal muscle necrosis together with intermuscular and subcutaneous oedema occurred in about 50% of cases. These lesions involved predominantly the large muscles of the pelvic girdle (55%) and to a lesser extent those of the neck and back (20%) and pectoral girdle (10%). Numerous small fine, linear caecal and colonic erosions were present in 10% of cases. Microscopically both the cardiac and skeletal muscle lesions were characterised by varying-sized focal areas of hyaline or lytic necrosis accompanied by vacuolisation of myofibres, round cell infiltration, and replacement fibrosis. The large intestinal lesions consisted of superficial erosions and cryptal abscesses.

RENAL PATHOLOGY IN CANINE EHRLICHIOSIS:
A LIGHT AND TRANSMISSION ELECTRON MICROSCOPIC STUDY

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The renal lesions in ehrlichiosis of 11 experimentally and 2 naturally infected puppies and 5 naturally infected adult dogs were studied. The infection was classified as severe, acute in 5 experimental cases and both naturally infected puppies; mild, acute in an adult dog; mild, subacute and chronic in the remainder of the experimental cases; and severe, chronic in the remainder of the natural cases. Irrespective of the severity of the infection, the glomerular lesion in the acute, subacute and chronic cases in the puppies was classified as diffuse mesangial proliferative glomerulonephritis. Initially, the reaction was confined to the glomerular tuft. Hypertrophy of the mesangial cells was accompanied by expansion of the mesangial matrix, protein deposition in the mesangium and subendothelial paramesangium, an early but transient leukostasis and endothelial proliferation, thrombosis of peripheral capillary loops, and plasmatic vasculosis. Ultimately, the lesion was characterised by gradual subsidence of the acute response leaving mesangial hypercellularity, discrete capsular adhesions, segmental proliferation of the parietal epithelium and periglomerular plasmacytosis. In severe chronic ehrlichiosis the glomerular lesion was representative of a diffuse, chronic and progressive membranoproliferative glomerulonephritis. Most affected glomeruli were hypertrophied. Mesangial expansion (matricial, cytoplasmic and cellular) was accompanied by double-contouring of the capillary walls, protein deposition in the mesangium and subendothelial paramesangium, segmental pedicular effacement and arteriolar hyalinosis in the glomerular tuft. The changes in the tuft were associated with extensive capsular adhesions, segmental proliferation of the parietal epithelium and periglomerular fibrosis and plasmacytosis. The extraglomerular renal lesions progressed in concert with the stage of the infection. The initial acute, focal phlebitis and pyelitis were succeeded by focal, plasmacytic, interstitial nephritis.

Insofar as renal failure in canine ehrlichiosis is concerned, it is concluded that the glomerular lesion is of greater significance.

PATHOLOGY OF ENCEPHALOMYOCARDITIS VIRUS INFECTION IN PIGS

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In pigs that died suddenly during an outbreak of the disease lesions of acute heart failure were present. These included purple discolouration of the skin of the underline, variable hydrothorax, hydropericardium and ascites, strands of fibrin in the peritoneal and pleural cavities and pericardial sac, mesenteric oedema, pulmonary congestion and oedema, and hepatic congestion. The right heart was often dilated. Multiple, discrete white areas 2-10 mm in diameter or large pale areas occurred in the ventricular myocardium affecting particularly the right ventricle, interventricular septum and papillary muscles. Occasionally the lesions contained small chalky white areas. Microscopically the cardiac lesions were characterized by necrosis of myocardial fibres accompanied by inflammatory infiltration of lymphocytes, plasma cells and macrophages. The necrotic and inflammatory areas overlapped. Areas of calcification in necrotic myocardium were common. In subacute cases (not seen in the outbreak) necrotic myofibres are apparently lysed and replaced by vascular fibrous connective tissue, seen as depressed red areas grossly. In chronic cases these are said to appear as white scars. In some of our cases the liver showed periacinar necrosis and haemorrhage and in a few pigs a very mild, diffuse lymphocytic meningoencephalitis was present. In one outbreak (in New Zealand) skeletal muscle lesions were found. They were not observed in any of our cases.

NUTRITIONAL OSTEODYSTROPHIA FIBROSA IN A LION CUB

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A ca 5-month-old female lion cub from an artificially reared litter in a Lion Park was submitted for post-mortem examination. The history was one of poor growth, skeletal malformations with disproportionately large head and feet, lameness and reluctance to move about. The animals were reared on a diet consisting of meat and milk supplemented with Calsup (Centaur) and Salupet (Salusa). The subject concerned, being the worst affected in the litter, was euthanized by an overdosage of barbiturates for necropsy purposes. It was found that all bones in the body were exceptionally soft and flexible. The long bones, vertebrae and ribs could easily be split in half with a knife. The scapulae were deformed, being curved medially. The long bones were shorter and thicker in diameter than normal with a very thin cortex and could easily be bent or twisted. Numerous pathological fractures with minimal callus formation were present. The ribs were rounded, abnormally curved and very short in comparison to the length of the costal cartilages. Radiographically there was a marked osteoporosis. Histopathological examination revealed a severe diffuse fibrous osteodystrophy with very little bone present but lots of fibrous connective tissue formed instead. The bone present was not properly calcified and sections were obtained without any need for prior decalcification. Little space for haemopoetic tissue remained. The lesions were considered classical for animals reared on a diet containing excess phosphates and insufficient calcium.

THE EFFECT OF AGE ON THE ABSORPTION AND DISPOSITION
OF ORALLY ADMINISTERED HALOGENATED SALICYLANILIDES
IN THE RUMINANT

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The uptake and movement of drugs within the body may be affected by a number of intrinsic or extrinsic factors. These factors may either increase or decrease the rate and/or extent of absorption, distribution, biotransformation and excretion of a drug, which could influence its efficacy and/or toxicity. Changes in the pattern of these processes, due to difference in age, have been described in the human and various animals species. In the development of the rumen, changes in the size of body fluid compartments, maturation of hepatic metabolic pathways, changes in the renal excretion patterns, differences in drug plasma binding and permeability of the blood brain barrier.

Studies were undertaken to examine the effect of age on the pharmacokinetics and pharmacodynamics of rafoxanide, a halogenated salicylanilide, administered orally to growing lambs from 2 weeks to 4 months of age, in comparison to adult sheep. The result of the initial experiments will be presented.

A STUDY ON SELECTED BLOOD PARAMETERS
IN CAGE-RESTRICTED CANAAN DOGS

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This study was conducted to establish normal base-line ranges of selected blood parameters in Canaan dogs. The values obtained were to be used for reference purposes for further canine physical training studies.

Nine Canaan dogs were individually adapted to small (0,85 x 0,85 x 1,38 m) cages over a month-long period. Blood samples were collected from the jugular vein, over a subsequent month, using evacuated blood-collecting tubes. Sampling occurred daily at 08h00 and 15h00. The samples were analysed for haematocrit (Hct), haemoglobin concentration (Hg), red and white blood cell count (RBC, WBC), total plasma protein concentration (TPP), plasma glucose concentration (G), plasma lactate concentration (L), plasma creatine kinase activity (CK), total plasma protein (TPP) and aspartate amino-transferase activity (AST) for a.m. and p.m. collections.

The mean values for all parameters except CK and AST lay within the established normal range for resting dogs. Mean values for CK and AST lay slightly above the normal range for resting dogs. Between-dog variation was significant ($P < 0,05$) for Hct, Hg and TPP. Distinct groups could be distinguished, within which there were no significant ($P < 0,05$) differences between dogs. These groups were similar for the a.m. and p.m. data in the case of related parameters (Hct, Hg and RBC). There was no significant between-dog variation for L, G, WBC, AST and CK. Diurnal variation was significant ($P < 0,0001$) in RBC and L only.

Intra and inter-individual variation in the levels of these blood parameters supports the theory that sufficient observations per animal are needed to establish normal ranges of single measured values before base-line values can be used for reference purposes.

THE EFFECT OF A STANDARD EXERCISE TEST ON CERTAIN
PHYSIOLOGICAL AND BIOCHEMICAL PARAMETERS IN TRAINED
ENDURANCE HORSES

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A standard exercise test was performed monthly for one year on a group of horses that were in training for competition in endurance rides. The standard exercise test was performed with the horses lunging freely in a lunge ring. The horses were cantered for a distance of 2000 metres at a speed of six metres per second.

The pulse rate, respiratory rate and body temperature were measured at rest, one, five and ten minutes after exercise. Blood samples were collected at each clinical examination and the red cell count, white cell count, packed cell volume, haemoglobin concentration and erythrocyte sedimentation rate determined. Total serum protein, albumin, and the protein fractions were determined from the collected blood samples and an additional blood sample collected four hours after exercise. Total serum lactate dehydrogenase and lactate dehydrogenase isoenzyme activities were determined from the blood samples collected at rest and four hours after exercise and blood lactate concentration from blood samples collected at rest, ten minutes and four hours after exercise.

The difference between the mean resting value and the mean one minute post-exercise value of the pulse rate, respiratory rate and white cell count in the horses in Group 1 (highly successful in competition in 1985) and those of the horses in Group 3 (unsuccessful in competition in 1985) were found to be significantly different ($P < 0,05$). Although trends were observed in a number of the other parameters measured, no significant differences ($P > 0,05$) were found to exist between any of them. This is probably due to the fact that this trial was not performed under controlled conditions, and that there were only a few horses in each group.

BLOEDGEGEWENS VAN HONDE VOOR EN NA OEFENING
OP 'N TRAPMEUL

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Honde van verskillende rasse is geleer om op 'n trapmeul te oefen. Die honde is in die onfikse toestand getoets. Enkele honde is fiks gemaak en weer op die trapmeul getoets. Veneuse bloedmonsters is op verskillende tye voor en na die oefening geneem. Die bloedmonsters is met standaard metodes in die laboratorium ontleed.

Verslag word gelewer oor die resultate van BUN, CPK, glukose, laktaat, lipiede, proteïen, hematokrit, hemoglobien, rooiseltelling en witbloedseltellings in die verskillende honderasse en tussen die verskillende eksperimente.

Die resultate kan dui op moontlike aanwysers om te bepaal of honde fiks of onfiks is.

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