



UNIVERSITEIT VAN PRETORIA
Fakulteit Veeartsenykunde
Faculty of Veterinary Science



PROGRAM EN OPSOMMINGS
PROGRAMME AND SUMMARIES

5de Fakulteitsdag
5th Faculty day
5 October 1988



COOPERS

Fakulteit Veeartsenykunde, Universiteit van Pretoria
Faculty of Veterinary Science, University of Pretoria

VYFDE FAKULTEITSDAG

FIFTH FACULTY DAY

5 Oktober/October 1988

Sponsored by/Geborg deur : Coopers Animal Health (Pty) Ltd

Reëlingskomitee/Organizing Committee

Proff RI Coubrough, MMS Smuts, BL Penzhorn, RO Gilbert,
JG van der Walt, GV Turner, IBJ van Rensburg, FJM Verstraete,
DGA Meltzer and/en Mev C van Vuren, Miss JE Arthey

PROGRAM / PROGRAMME

FAKULTEITSDAG - 5 OKTOBER 1988 FACULTY DAY - 5 OCTOBER 1988

- 08H00-08H30 REGISTRATION/REGISTRASIE
- 08H30-19H00 BESIGTIGING VAN KUNS- EN STOKPERDJIE-UITSTALLING
VIEWING OF ART AND HOBBY EXHIBITION
- 08H30-08H35 VERWELKOMING DEUR DEKAAN/WELCOME BY THE DEAN
- 08H35-09H20 SIR ARNOLD THEILER MEMORIAL LECTURE/GEDENKLESING
- DR R.D. Bigalke, Hoofdirekteur: Diereproduksie,
Dept. Landbou en Watervoorsiening
- 09H20-09H50 FOKUS OP: DEPARTEMENT FARMAKOLOGIE &
TOKSIKOLOGIE
FOCUS ON: DEPARTMENT OF PHARMACOLOGY &
TOXICOLOGY
- 09H50-10H20 SCIENTIFIC PROGRAMME/WETENSKAPLIKE PROGRAM

Chairman: Professor R.I. Coubrough
1. Effect of injection site (intramuscular or
subcutaneous) on the bioavailability of
oxytetracycline given to sheep.
G.E. Swan, G. Olivier, M.S.G. Mulders &
S.F. van Amstel.
 2. Die aktiwiteit van gamma-glutamiel-transpeptidase
in skaapurine.
J.S. van den Berg.
- 10H20-10H30 TOEKENNING AAN DOSENT VAN DIE JAAR
LECTURER OF THE YEAR AWARD
- 10H30-11H00 TEA AND VIEWING OF POSTERS
TEE EN BESIGTIGING VAN PLAKKATE

11H00-13H00 WETENSKAPLIKE PROGRAM/SCIENTIFIC PROGRAMME

Voorsitter: Professor D.R. Osterhoff

3. Ascites and the anatomy of the peritoneal sacs of broilers.
A.J. Bezuidenhout.
4. The ileorectal shunt: a viable animal model for digestion studies.
J.G. van der Walt.
5. Prostaglandin E₂ as an adjunct to equine partus induction.
D.H. Volkmann, H.J. Bertschinger, M.L. Schulman, S.E. Murray & D. van Zyl.
6. Die effek van laparoskopiese inseminasie op die estrussiklus van die ooi.
T.L. Taljaard, S.J. Terblanche & H.J. Bertschinger.

Chairman: Professor J.F.W. Grosskopf

7. The effect of gonadotropin, androstenedione and method of synchronization on the superovulatory response of Dorper ewes.
S.J. Terblanche.
8. The development and use of nucleic acid probes for the detection of bluetongue virus.
Estelle H. Venter, H. Huismans & A.A. van Dijk.
9. Detection of antibody to canine parvovirus (CPV) in dog sera by enzyme immunoassay (ELISA) and haemagglutination inhibition (HI).
Jennifer A. Spencer, A.G. Lessing, J.A. Strydom & P.G. Howell.
10. Patofisiologiese veranderinge na intraveneuse toediening van endotoksien in die perd.
P. Stadler & S.R. van Amstel.

13H00-14H00 VIEWING OF POSTERS/BESIGTIGING VAN PLAKKATE

- 14H00-15H15 PANEELBESPREKING: WILD
 PANEL DISCUSSION: WILDLIFE
 These topics are of particular interest with the establishment of the new PFV Chair in Wildlife Diseases and will make up part of the curriculum presented to undergraduate veterinary students from the beginning of next year.
- Chairman: Professor D.G.A. Meltzer
1. The utilization of wild animals. R.G. Bengis.
 2. Game farming. J. du P. Bothma.
 3. Mass vaccination of free-ranging large wild mammals using a ballistic implantation system. V. de Vos.
 4. An integrated approach to an ecological problem: cats on Marion island. R. van Aarde.
- 15H15-15H30 REFRESHMENTS/VERVERSINGS
- 15H30-16H45 PANEELBESPREKING: NUWE ONTWIKKELINGS
 IN KLINIESE KLEINDIERWETENSAPPE
 PANEL DISCUSSION: RECENT ADVANCES IN SMALL ANIMAL CLINICAL SCIENCES
- Voorsitter: Professor P. Bland-van den Berg
1. Computerized tomography in small animal brain disease. W.L. Berry.
 2. Laparoscopic technique for intra-uterine insemination of bitches. B.D.W. van der Merwe & H.J. Bertschinger.
 3. Canine orthodontics. F.J.M. Verstraete.
 4. Verwagtings van die privaat praktyk. P.H. le Roux.
- 16H45-16H55 DEAN'S AWARD FOR BEST PAPER AND POSTER
 DEKAANSTOEKENNING VIR BESTE REFERAAT EN PLAKKAAT
- 16H55-17H00 AFSLUITING/CONCLUSION - Professor M.M.S. Smuts
- 17H00-19H00 COCKTAIL PARTY/SKEMERPARTYTJIE

PAPER 1

EFFECT OF INJECTION SITE (INTRAMUSCULAR OR SUBCUTANEOUS) ON
THE BIOAVAILABILITY OF OXYTETRACYCLINE GIVEN TO SHEEP

G E Swan, G Olivier¹, M S G Mülders and S F van Amstel¹

Department of Pharmacology and Toxicology

¹ Department of Medicine

Oxytetracycline injectable may be administered either intramuscularly or subcutaneously. Studies performed in humans, goats, cows and calves indicate that the site of injection may affect both the extent and rate of absorption of a drug. In the case of oxytetracycline, the highest peak plasma concentrations (C_{max}) and greatest extent of absorption (measured by area under the plasma concentration versus time curve = AUC) were achieved in calves after intramuscular injection in the shoulder, and the lowest values after injection in the buttock.

In the present study, the effect of two different intramuscular and subcutaneous injection sites on the bioavailability of oxytetracycline in sheep was examined. Merino ewes (4) were used in a cross-over, latin square trial. Oxytetracycline was initially administered intravenously to all ewes, whereafter it was injected intramuscularly or subcutaneously. Intramuscular injections were sited in the triceps and gluteal muscles, while subcutaneous injections were placed behind the ear and in the axilla region. Blood samples were collected prior to the experiment, and at 10 intervals, from 30 minutes to 48 hours, after each injection. Different injections for each sheep were spaced 7 days apart. Oxytetracycline levels were determined by spectrofluorometric analysis and the data analysed by means of appropriate pharmacokinetic and statistical methods.

The results show that the highest C_{max} and AUC for subcutaneous and intramuscular injection were obtained at the site behind the ear and in the neck, respectively.

DIE AKTIWITEIT VAN GAMMA-GLUTAMIEL-TRANSPEPTIDASE
IN SKAAPURINEJ.S. van den Berg
Departement Geneeskunde

Gamma-glutamiel-transpeptidase (GGT) word hoofsaaklik aangetref in die niere, lewer, pankreas en die longe. Omdat die uitskeiding van GGT in urine gebruik kan word om proksimale nierbuisskade aan te wys, is 'n laboratoriumtegniek beoordeel om dit in die skaap te meet. Die uitskeiding van GGT is ook vergelyk met die verlies van kreatinien (Kr).

Urienmonsters is versamel en gesentrifugeer, waarna die bovloeistof binne 30 min na versameling ontleed was vir GGT-aktiwiteit deur gebruik te maak van 'n RA 1000 chemiese analiseerder en kommersieël beskikbare reagense. Die bepaling van GGT in skaap urine is getoets vir herhaalbaarheid en lineariteit, deur die GGT-aktiwiteit van verskeie urienmonsters, asook serieverdunnings daarvan, telkens te bepaal. Die bepaling van GGT in urine is met die in plasma vergelyk, deur 'n fisiologiese soutoplossing met 'n GGT-ekstrak te maak en die aktiwiteit van GGT daarin te meet. Urien en serummonsters is versamel en GGT-aktiwiteit is ook daarin gemeet. Gelyke dele van die aangemaakte GGT-oplossing is daarna by elk van die 2 vloeistofmedia gevoeg en die GGT-aktiwiteit weer eens gemeet. Om die stabiliteit van GGT in urine te bepaal, is vars urine gestoor teen 4° , 25° en -20° C, en die verandering in GGT-aktiwiteit na 12 en 24 uur gemeet. Om die uitskeiding van GGT in die urine oor 24 uur te volg, is urienmonsters elke 6 ure versamel en die GGT-aktiwiteit daarin met die Kr-konsentrasie vergelyk. Standaard statistiese tegnieke is gebruik om 'n populasieverwysingswaarde vir GGT/Kr in skape te bereken.

Tussen-skaap variasie het 93% van die totale variasie verteenwoordig. Dus behoort enkelmeting van GGT-aktiwiteit op urine voldoende te wees in 'n kliniese situasie. Variansie-analise het bewys dat GGT-aktiwiteit lineêr is tussen 48 en 373 u/l ($P < 0.05$). Met byvoeging van GGT tot urine was daar geen verskil tussen verwagte en gemete waardes nie. Daarteenoor was daar wel 'n betekenisvolle verskil ($P < 0.001$) tussen waardes waar serum gebruik was. Geen verskil ($P > 0.05$) tussen die 2 vloeistofmedia tov waargenome/verwagte GGT-aktiwiteite was gevind nie. In geen van die verskillende bergingstemperature was die verskil in GGT-waarde voor en na berging betekenisvol nie, alhoewel die minste verandering teen 4° C na 24 uur voorgekom het. Alhoewel individuele GGT en Kr waardes baie gewissel het, het die verhouding tussen hulle konstant gebly. Data van 16 skape is normaal verdeel tov GGT/Kr. Die gemiddelde verhouding was $29,1 \pm 7,0$. Aangesien 99% van 'n normaalverdeling onder dié waarde "gemiddeld + 3x standaardafwyking" sal lê, die verwysingswaarde vir GGT/Kr bereken word as 50,1.

Die tegniek wat huidig gebruik word om GGT in serum te bepaal kan net so op gesentrifugeerde skaapurine toegepas word. Deur Kr ook te bepaal, kan die noodsaaklikheid van 'n 24 uur urienversameling uitgeskakel word. Beperkte kliniese waarnemings het aangedui dat skape met verskillende vorms van nierbuisskade wel waardes vir GGT/Kr wat > 50 is aantoon.

ASCITES AND THE ANATOMY OF THE PERITONEAL SACS OF BROILERS

A.J. Bezuidenhout
Department of Anatomy

The ascites syndrome of young broilers is a well recognised condition responsible for great economical losses, especially during the cold winter months. There are many vague and conflicting reports regarding the cavities affected in various ascites-associated diseases. To understand the pathogenesis of ascites in disease conditions, it is necessary to define which of the serous cavities are affected. In the present study it was ascertained which of the cavities are affected in the ascites syndrome of broilers.

One hundred Ross, Hubbard and Hybro strain broilers which had died from the ascites syndrome or were suffering from clinically detectable ascites, were randomly collected. The birds were humanely slaughtered and pinned to a board in dorsal recumbency. The various peritoneal cavities were then carefully opened, the ascitic fluid collected and measured, and the cavities inspected for communications.

In all stet broilers examined, the left and right ventral hepatic peritoneal cavities were grossly distended. Each contained between 100 and 150 ml transudate. In 30 broilers, the two ventral cavities communicated freely with each other through a large perforation in the ventral mesentery. The right dorsal hepatic peritoneal cavity was moderately distended and contained between 10 and 30 ml transudate. No communications with other cavities were found. No transudate was encountered in the left dorsal hepatic peritoneal cavity of any of the broilers. The cavity communicated freely with the intestinal peritoneal cavity in all stet broilers. Only a small amount of transudate was found in the intestinal peritoneal cavity. This varied between 1 and 10 ml and did not cause abdominal distension in any of the broilers. The pericardial cavities of all stet birds examined contained between 0,5 and 4 ml of transudate. No communications with the other cavities were found.

In the present study, large quantities of fluid were found in the left and right ventral hepatic peritoneal cavities, a moderate amount in the right dorsal hepatic peritoneal cavity, small amounts in the pericardial and intestinal peritoneal cavities and none in the left dorsal hepatic peritoneal and pleural cavities. The volume of fluid found in each of the 4 hepatic peritoneal cavities was directly proportional to the free surface area of the liver contained within each of these cavities. These observations support the hypothesis that venous hypertension caused by right ventricular overload could be the cause of such an effusion from the liver.

THE ILEORECTAL SHUNT: A VIABLE ANIMAL MODEL
FOR DIGESTION STUDIESJ.G. van der Walt and J.H.F. Meyer¹

Department of Physiology

¹Animal Nutrition, ADSRI, Irene

Many techniques, both in vitro and in vivo, have been developed to test protein digestibility in ruminants. All of the in vivo methods suffer from a large measure of uncertainty introduced by the variable effect of fermentation in the large intestine. By creating an ileorectal anastomosis, the large intestine may be entirely bypassed, thereby allowing ileal digesta to be directly sampled at the point of exit.

As part of establishing the physiological stability of such a model, feed intake, nutrient digestibility and rate of passage of digesta through the various compartments of the tract were measured from 2 weeks before, to 4 weeks after bypassing the large intestine of 4 SA Mutton Merino sheep fed chopped lucerne hay ad libitum. Values obtained for feed intake (1419 \pm 196 g/d dry matter=DM), and the digestibility of DM (60 \pm 1%), organic matter (64 \pm 1%) and nitrogen (72 \pm 3%) did not change significantly after surgery (1323 \pm 147, 61 \pm 7%, 66 \pm 7% and 75 \pm 8% respectively). As a result, nitrogen retention appeared to be unaffected by the loss of the large intestine, despite a significantly decreased urinary excretion rate (19 \pm 3 and 15 \pm 2 g/d nitrogen respectively). Retention of digesta by the reticulorumen complex decreased slightly after surgery (16 \pm 3 h and 14 \pm 1 h respectively), due mainly to the increased intake of water. However, flow of digesta through the other compartments appeared to be unaffected by the anastomosis.

Aside from an increased demand for water, salt and minerals, the sheep appeared to be stable models and could be maintained in outside camps, provided that salt licks were provided. Such animal models have proved to be suitable for studies on small intestine function, and will be used, *inter alia*, for examining protein digestion, worm infestation and mineral uptake.

PROSTAGLANDIN E₂ AS AN ADJUNCT TO EQUINE PARTUS INDUCTION

D.H. Volkmann, H.J. Bertschinger, M.L. Schulman
S.E. Murray¹ and D. van Zyl
Department of Theriogenology
¹Department of Zootechnology

It is desirable to maintain constant supervision over foaling mares to ensure that indicated interventions can be performed promptly before harm could come to either mare or foal. This supervision is costly and often difficult to maintain since the normal gestation length of mares can vary between 320 and 360 days. Partus induction is often used to force the mare into labour at a time when veterinary assistance is available. Prerequisites for partus induction include: adequate relaxation of the pelvic ligaments, the presence of adequate colostrum in the udder, some degree of cervical softening and proof that the foetus is > 320 days old. Cervical softening is usually the last condition that can be met and has the disadvantage that it cannot be assessed by the breeder himself.

This study was designed to assess the value of PGE₂ either on its own or in combination with oxytocin for the induction of parturition in mares. Three groups of Nooitgedacht-type mares were used. Group 1 (n = 5) was treated with 10 i.u. oxytocin administered intravenously on the first day after day 325 of pregnancy, that all the conditions listed above were met. Groups 2 and 3 were treated on the first convenient day after day 325 of pregnancy, regardless of whether the mares' cervixes were dilated or not. Group 2 (n = 6) was treated repeatedly with 0,5 - 2,0 mg PGE₂ administered intracervically. Group 3 (n = 8) was treated with intracervical PGE₂ to ensure cervical dilation, followed by 10 i.u. oxytocin intravenously 30 min later to induce parturition.

The mean gestational age for mares at the time of treatment was 336, 334 and 330 days for Groups 1, 2 and 3, respectively. The mares in the 3 groups foaled 41 min, 100 h and 46 min, respectively, after their last induction treatment.

All the foals were mature enough to survive, but neonatal infections occurred in 4 foals (1 in Group 2, 3 in Group 3). It is believed that these infections could have been avoided by proper intervention during and after partus.

It is concluded that PGE₂ on its own induces excellent cervical relaxation, but not partus in near term mares. In combination with oxytocin, PGE₂ can be used for fixed-time partus induction in mares after day 325 of gestation.

DIE EFFEK VAN LAPAROSKOPIESE INSEMINASIE OP DIE
ESTRUSSIKLUS VAN DIE OOI.

T.L. Taljaard, S.J. Terblanche en H.J. Bertschinger.
Departement Geslagskunde

In sekere skaapkuddes is gevind dat die lengte van die estrussiklus wat volg na laparoskopiese inseminasie abnormaal verleng is. Die doel van die proef was om te bepaal of die laparoskopiese tegniek van inseminasie per se die lengte van die daaropvolgende estrussiklus en die funksie van die corpus luteum van die ooi beïnvloed.

31 Dorperooie (tweeand tot volbek) met 'n gemiddelde massa van 50 kg in kondisie 2 is ewekansig in twee groepe verdeel. Groep A (n = 15) is laparoskopies geïnsemineer met semenverduunningsmiddel en groep B (n = 16) het gedien as kontroles. Op Dag -16 is Chronogest-sponse (flurogestone acetate, Intervet) in al die ooie geplaas en op Dag -3 om 23h30 onttrek en terselfdertyd is 300IE dragtige merrieserum-gonadotropien intramuskulêr gespuit. Op Dag -1 is die ooie in al stet groepe uitgehonger en is koggelramme met merkerblokke by hulle gesit. Op Dag 0 om 0h00 is Groep A laparoskopies geïnsemineer met semenverduunningsmiddel na berusting met Rompun. Beide groepe is gebloei vir progesteronbepalings op die dag van laparoskopie (Dag 0) en daarna op Dag 7, 18, 25 en 36. Die kontroles is slegs aan die sinkronisasieprosedures onderwerp. Progesteronbepalings is d.m.v. 'n radio-immunoessiaseringsmetode gedoen.

Al die ooie is duidelik gemerk op Dag 0 en die ooie wat laparoskopies met verdunner geïnsemineer is, het met die uitsondering van twee ooie, 'n goeie baarmoedertonus getoon. In die daaropvolgende siklus was 11 ooie van beide groepe duidelik gemerk. Die res was twyfelagtig gemerk of het geen estrus getoon nie. Die lengte van die estrussiklus van Groep A en B was onderskeidelik $18,18 \pm 4,95$ en $17,82 \pm 4,95$ dae. Hierdie verskil was nie statisties betekenisvol nie (t-toets, $P > 0,1$). Laparoskopiese inseminasie per se affekteer dus geensins die lengte van die daaropvolgende estrussiklus nie. Oorsake van 'n verlengde estrussiklus soos opgemerk in die veld moet dus aan ander faktore toegeskryf word.

THE EFFECT OF GONADOTROPIN, ANDROSTENEDIONE,
AND METHOD OF SYNCHRONIZATION ON THE SUPEROVULATORY
RESPONSE OF DORPER EWES

S.J. Terblanche
Department of Theriogenology

The study was designed to investigate the potential of two gonadotropins, Follicle Stimulating Hormone (FSH) and Pregnant Mare Serum (PMSG), to stimulate ovum production in androstenedione-vaccinated and control ewes. Synchronization of oestrus was achieved at two levels with medroxyprogesterone sponges alone, or with a combination of medroxyprogesterone sponges and prostaglandin (Cloprostenol). Mature Dorper ewes (n=53) were assigned at random to 8 treatment groups in a 2x2x2 factorial trial. Rams with marker harnesses were present during the superovulatory oestrus. Ova were recovered 3-5 days after oestrus by laparotomy, when corpora lutea were also counted. Fertilized ova were classified into 4 morphological categories. Analysis of variance and a log-linear model were used to analyse the data.

FSH emerged as the superior gonadotropin over PMSG in terms of mean number of corpora lutea and viable embryos recovered. Ewes treated with FSH and PMSG produced $7,75 \pm 1,55$ and $3,75 \pm 0,66$ embryos respectively. Fewer embryos were recovered from ewes synchronized with medroxyprogesterone plus cloprostenol than from the medroxyprogesterone group, with $4,66 \pm 1,19$ and $7,12 \pm 1,42$ respectively. Prostaglandin caused an interaction with androstenedione which resulted in a dramatic decrease in recovery rate. The net result was that fewer embryos were recovered from androstenedione-immune ewes than from controls, with means of $4,56 \pm 0,84$ and $7,17 \pm 1,58$ respectively.

FSH was the best gonadotropin, with medroxyprogesterone alone as the best method of synchronization. Androstenedione and cloprostenol had no advantages in a donor preparation program.

THE DEVELOPMENT AND USE OF NUCLEIC ACID PROBES
FOR THE DETECTION OF BLUETONGUE VIRUS

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Department of Infectious Diseases

¹Department of Genetics, Faculty of Agriculture

²Biochemistry Section, VRI, Onderstepoort

Bluetongue virus (BTV) which belongs to the Orbivirus genus of the family Reoviridae, is the cause of an economically important disease of sheep. The identification of 24 serotypes of BTV creates problems in the study of the epidemiology and in the diagnosis of the disease.

The object of this study was to develop a cloned genome segment that will act as a group-specific probe for BTV. Previous studies suggested that both cloned segments 3 and 5 may be suitable for this purpose. In this study, these segments of BTV serotype 4 were cloned from pBR 322 to a transcription vector p SPT 18.

Results show that the DNA probe of segment 5 identify most of the 24 serotypes. Segment 5 was also more sensitive than segment 3, especially during virus replication. The RNA probe of segment 5 was also more sensitive than segment 3 in recognising the virus in tissue culture at certain times post-infection.

Further studies seek to establish the use of these probes in the diagnosis of the virus in blood of infected animals, in infected tissue and in Culicoides spp., the insect vectors of BTV.

DETECTION OF ANTIBODY TO CANINE PARVOVIRUS (CPV)
IN DOG SERA BY ENZYME IMMUNOASSAY (ELISA) AND
HAEMAGGLUTINATION INHIBITION (HI)

Jennifer A. Spencer, A.G. Lessing¹,
J.A. Strydom² and P.G. Howell†

Department of Infectious Diseases

¹South African Defence Force

²South African Police Dog School

Puppies with HI antibody titres in excess of 1:80 are generally considered to be immune to natural infection by canine parvovirus (CPV).

Maternally derived antibody in excess of 1:20, as determined by HI, prevents active immunisation with live attenuated homologous vaccines. This implies that, for a period of approximately 3 weeks while antibody concentrations are declining, puppies may be susceptible to natural infection and, at the same time, refractory to effective immunisation. It is therefore important to be in a position to monitor the decline in maternally derived antibody in order to be able to immunize puppies at a time when optimum efficacy may be achieved.

Puppies were bled every second week from 4 to 18 weeks of age and their antibody levels determined by HI. As none of the anticipated decreases in antibody titre were detected, an ELISA test was developed and the sera re-examined. When the results of the two tests were compared, the ELISA test proved to be more sensitive and the anticipated changes in antibody titres could, in fact, be discerned.

PATOFISIOLOGIESE VERANDERINGE NA INTRAVENEUSE
TOEDIENING VAN ENDOTOKSIEN IN DIE PERD

P. Stadler en S.R. van Amstel
Departement Geneeskunde

Die doel van hierdie navorsing was om die subletale aard van 'n intraveneuse dosis van 10 ug/kg endotoksien in die perd en die gepaardgaande kliniese en patofisiologiese veranderinge wat gerapporteer is, te bevestig. Indien hierdie dosis letaal sou blyk te wees, sou vasgestel word of 'n dosis van 1 ug/kg as 'n subletale model gebruik kon word en die aard en omvang van die gepaardgaande kliniese en patofisiologiese veranderinge sou bepaal word.

Kommersiële E. coli 0 55 : B 5-endotoksien is as 'n intraveneuse bolus teen 10 ug/kg aan 2 en later teen 1 ug/kg aan 'n verdere 4 perde toegedien. Verskeie kliniese en klinies-patologiese parameters is herhaaldelik gedurende die eerste 24 uur na toediening gemonitor.

Die toediening van 10 ug/kg endotoksien het letale patofisiologiese veranderinge veroorsaak. Die toediening van 1 ug/kg endotoksien het gelei tot:

- a) verskeie nie-spesifieke kliniese veranderinge
- b) statisties betekenisvolle veranderinge ten opsigte van arteriële suur-basisbalans, totale serumproteïene, serumlaktat, serumelektroliete, bloedglukose, hematologie en bloedstolling.

Die volgende gevolgtrekkings word gemaak:

1. 'n Intraveneuse dosis van 10 ug/kg endotoksien is potensieel letaal in die perd.
2. 'n Intraveneuse dosis van 1 ug/kg endotoksien kan as 'n model van subletale endotoksemie in die perd gebruik word
3. Die sensitiwiteit van perde vir die toksiese effekte van endotoksiene varieer.
4. Subletale endotoksemie in die perd lei tot verskeie kliniese en patofisiologiese veranderinge.

EFFECT OF ILEORECTAL ANASTOMOSIS ON BLOOD GAS
AND ELECTROLYTE BALANCE OF SHEEP

J.G. van der Walt and H.H.F. Meyer¹

Department of Physiology
¹Animal Nutrition, ADSRI, Irene

The large intestine may be bypassed to study, inter alia, partial digestion in the small intestine. Since the resulting increase in water loss may lead to an imbalance in blood gases and/or electrolytes, changes in these parameters were followed for 5 weeks after surgery.

SA Mutton Merino wethers (4) were kept in metabolism cages, fed lucerne hay ad libitum and had free access to water. Intake of feed and water and production of faeces and urine were determined daily and weight gain weekly. Jugular blood samples were obtained weekly for 5 weeks prior to surgery. Thereafter, blood samples were drawn daily for the first 5 days, and twice weekly for the remaining 5 weeks. All samples were analyzed for pH, pO₂, pCO₂, haematocrit, haemoglobin, osmolality, urea, Na⁺, K⁺, Ca⁺ and Cl⁻. Immediate post-operative electrolyte and pH imbalances were treated by infusion of Ringer's lactate solution. Mean blood gas and electrolyte parameters were calculated for pre-operative (n=5) and post-operative (n=5, 3-5 weeks) periods.

Despite an increased loss of water (2500 ml/day) in the faeces, blood haematocrit, osmolality, pH, urea, and Na⁺ did not change. Blood Ca⁺ and Cl⁻ values and the Bicarb/Carb ratio appeared to increase, although the differences were not significant. While blood bicarbonate concentrations increased significantly, K⁺ and O₂ concentrations decreased.

These results suggest that the loss of HCl (normally resorbed from the large intestine) via the faeces, led to bicarbonate accumulation in the blood, and caused a metabolic alkalosis, which was compensated by a respiratory acidosis.

A SIMPLE PHYSIOLOGICAL INVESTIGATION INTO RACEHORSE TRAINING
IN THE TRANSVAALJennifer C. Sneddon, J. Bester and Valerie M. Killeen
Department of Physiology

Eight 2-year-old thoroughbreds (4 male, 4 female) were subjected to a standard exercise test (SET) over 8 consecutive weeks at the onset of training. The effect of the SET on recovery patterns for heart rate (HR), rectal temperature (RT), haematocrit (Hct) and haemoglobin (Hb) were analysed against training status as defined by week of monitoring.

Time taken to complete the SET decreased with training status ($P < 0,0001$), with no significant differences between horses ($P < 0,2$). Resting heart rate declined significantly ($P < 0,001$) with training status. The % change from rest in HR during a 20 min recovery period increased with training status ($P < 0,0001$). The level of training was probably too intense for expected cardiac adaptations to occur. Resting values for HR were not attained within 20 min post-exercise. Fillies recovered more rapidly than colts, a fact often noticed by trainers. Two horses, H1 and H7, showed the most rapid recovery values and continued to be the best performers when raced. The % change from rest in RT during 10 min of the recovery period correlated positively with environmental conditions throughout the commencement of summer. The "environmental sum" (relative humidity plus temperature in °F) was < 150 at all times and < 130 most of the time. Evaporative cooling was therefore not compromised and the increase in core temperature was not dangerous. H1 showed significantly smaller increases ($P < 0,001$) than the remainder, indicating a superior thermoregulatory ability. Magnitude of change from rest in Hct and Hb both tended to increase with training status, where the largest significantly higher increases were associated with colts ($P < 0,05$ in both cases), H1 and H7 again showing the largest increases ($P < 0,05$ in both cases). This was ascribed to improved oxygen carrying capacity.

A fitness index is suggested to be a practical tool for trainers. This should include testing the decrease in HR at 20 min post-exercise as a % of HR determined immediately post-exercise/running time. An upward trend in this index would indicate an improvement in cardiovascular performance with increased work load (ie. speed).

VALIDATION OF THE TRITIATED WATER DILUTION
TECHNIQUE USED TO ESTIMATE FRACTIONAL
TURNOVER RATES OF BODY WATER IN SHEEP

R.A. Meintjes and P. Minnaar
Department of Physiology

Markers which diffuse throughout the total body water pool have frequently been used to estimate total body water and water turnover rates in animals. While the former use has been validated on many occasions (by desiccation studies of the carcass), the latter use, viz to estimate water turnover, has seldom been validated. As body water turnover forms an important part of the series of experiments being conducted by the authors, it was pertinent at this stage to validate the use of tritiated water as a marker in determining body water turnover rates of sheep.

Fractional water turnover rate (i.e. that proportion of total body water which is exchanged daily) was determined in 6 S.A. Mutton Merino sheep under thermoneutral conditions by direct measurement of total water intake and by the tritiated water dilution technique.

No significant difference between direct and indirect methods was observed in any of the animals. For each animal, the tritiated water space estimated from a plasma sample taken 6 h after tritium administration in general overestimated this compartment when compared with values derived from the zero time intercept of the excretion curve derived by linear regression analysis.

The tritiated water dilution technique provided an easy and highly accurate means of establishing water turnover rates in sheep which are in a steady state with respect to their total body water.

VETERINARY ACUPUNCTURE IN THE HORSE AND DOG

G.J. Louw and Christine J. van Vuren

Department of Anatomy

The two manifestations of life energy, Tchi, are Yin (the male, dominant, assertive) and Yang (the female, submissive, receiving); they are normally in a perfect balance. They can be equated with the sympathetic and parasympathetic components of control, which may be disrupted. Acupuncture treatment will reinstate the correct balance.

Acupuncture may be used either for diagnostics or for therapy (including analgesia). The points that are used for acupuncture stimulation lie along the 12 meridians, the routes of Tchi. These points may be identified if they are sensitive, or else with a pointer comparing electrical resistance of a point with that of the surrounding tissues. Points are stimulated by needles, electro-acupuncture, laser or thermal stimulation.

Acupuncture analgesia works by stimulating large myelinated nerve fibres which conduct the stimulus to the dorsal horn of the spinal cord, along ascending white tracts, and to the brain. The ascending pain impulses are blocked by a complex interaction of numerous natural body opiates in which, for example, serotonin, endorphins, enkephalin, norepinephrine and substance P all have important roles.

The practice of veterinary acupuncture requires the co-operation of both the owner and the animal. Its uses include locomotor (especially horses) and neurological (e.g. epilepsy) disturbances, painful conditions, chronic infections, gynaecology (e.g. caesarian sections) and gastrointestinal disturbances (e.g. colic in horses, gastric torsion in dogs). Acupuncture analgesia can be used to advantage in combination with conventional anaesthetic agents.

This presentation explains the mechanisms of acupuncture analgesia, indicates some points along meridians in the horse and dog, and shows an accredited acupuncturist at work.

'N TERAPEUTIESE NIEROORPLANTING IN 'N HOND
IN SUID-AFRIKA

Shirley. V. Yeates en U.H. Tubbesing
Departement Geneeskunde

'n Nieroorplanting is die enigste hoop vir honde met kroniese nierversaking en daar word gepoog om dit as 'n moontlike aanvaarbare alternatief vir genadedood daar te stel. Die inwin van kennis en praktiese vaardigheid mbt die terapeutiese aspekte van 'n nieroorplantings pasiënt was die doel van hierdie projek.

Die pasiënt is vir 7 weke op aanhoudende ambulatoriese peritoneale dialise (Dianeal, Sabax) onderhou vir die beheer van uremie. Immunoonderdrukkende terapie was tweeledig. Pre-operatief het die pasiënt 'n kursus van totale limfositiese bestraling (TLB) ondergaan (10 x 80 Rads) en post-operatief is chemoterapie toegepas, nl. siklosporien (Sand-Immune, Sandoz) en prednisoloon. 'n Bilaterale nefrektomie is op die pasiënt uitgevoer, waarna 'n gesonde nier mbv Carrel se flapmetode vanaf 'n donor oorgeplant is.

Die pasiënt is goed mbv peritoneale dialise gestabiliseer. Die nieroorplanting is suksesvol uitgevoer; post-chirurgiese oorlewing was 4 maande. Post-operatiewe lewenskwaliteit van die pasiënt was goed. 'n Nie-responsiewe piëlonefritis (E. coli), asook 'n kroniese verwerpingsreaksie het egter tot genadedood van die pasiënt gelei.

Die oorlewingstydperk van hierdie pasiënt vergelyk uitstekend met 'n soortgelyke studie wat in die VSA gedoen is. Koste van immunoonderdrukkende chemoterapie word grootliks deur TLB verlaag. Dit mag daartoe lei dat nieroorplantings in troeteldiere 'n ekonomiese en prakties aanvaarbare terapeutiese moontlikheid word, wat verdere navorsing regverdig.

THE EFFICIENCY OF CYTOLOGY IN THE DIAGNOSIS
OF NEOPLASIA IN ANIMALS

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¹Department of Companion Animal Medicine and Surgery,
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The purpose of the survey was to establish to what extent cytological examination of samples was correlated with histopathologic techniques.

A retrospective survey was conducted of all cytological examinations conducted in the years 1986 and 1987 by the Section of Clinical Pathology of the Department of Medicine. Specimens examined varied from fine needle aspirates of tumors (swellings) and impression smears of biopsy samples to cellular concentrates of various body fluids (abdominal, thoracic, joint, CSF, urine) and also included bone marrow aspirates. Specimens were examined using the routine haematological Romanowski stain CAM-QUICK and, occasionally, New Methylene Blue.

Cytological samples from 900 cases were examined during this period of which 127 were diagnosed cytologically as neoplasia. Histopathological reports were available for 66 of these cases, confirming the cytological diagnosis in 82% of cases. Of these 66 cases, all diagnoses based on bone marrow aspirates were confirmed as were 10 (90%) based on lymph node fine needle aspirates and 24 (90%) based on tumor (swelling) fine needle aspirates. Only 2 (33%) diagnoses of neoplasia based on examination of CSF were confirmed. In 11 out of the 12 incorrect cytological diagnoses, hyperplasia or reactive inflammatory change was found histopathologically.

Cytological diagnosis of neoplasia appears to be a highly sensitive and sufficiently specific method. Care must be exercised in the interpretation of CSF specimens where round cell infiltration can be mistaken for neoplasia. Furthermore, hyperplastic and reactive inflammatory states may easily be over-interpreted as being neoplastic.

THE ULTRASTRUCTURE OF AMASTIGOTES OF A LEISHMANIA
SPECIES IN THE BONE MARROW OF A DOG

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Department of Anatomy
¹Department of Medicine

Visceral or systemic leishmaniasis is a disease caused by protozoans of the genus Leishmania which parasitize and multiply within macrophages of the reticuloendothelial system of the vertebrate host. The organisms exist within the macrophages in the nonflagellated amastigote form and can be readily identified in the bone marrow, spleen, liver and lymph nodes. This poster describes the ultrastructure of amastigotes of a Leishmania species in the bone marrow of a dog which showed clinical signs of visceral leishmaniasis.

Bone marrow biopsies were diced into small blocks and immersion-fixed in 4% phosphate-buffered glutaraldehyde, post-fixed in 1% osmium tetroxide, and routinely processed for transmission electron microscopy.

Most macrophages in the bone marrow contained between one and ten amastigotes. The organisms were round or oval, 2.03 μ m in mean diameter, and enclosed by a well-defined, electron-dense, plasma membrane. Immediately beneath the plasmalemma was a single row of evenly spaced sub-pellicular microtubules which appeared to be interconnected by means of fine lateral bridges. The nucleus was round, and characterised by marginal accumulations of chromatin material. Mitochondria exhibiting round or elongated profiles containing a few short cristae were present, and in some sections appeared to be interconnected. A conspicuous kinetoplast was obvious in most parasites and consisted of a fibrous rod or comma-shaped body lying within the matrix of a mitochondria-like structure. The amastigotes contained a stubby internal (intracellular) flagellum which protruded a short distance beyond the cell body. The flagellum was situated within a flagellar canal or pocket formed by an invagination of the plasmalemma and displayed the typical 9+2 axonemal configuration, the microtubules arising from a basal body situated in the vicinity of the kinetoplast. Also visible in the amastigotes were lipid droplets, occasional dense bodies and vacuoles, a Golgi apparatus, short profiles of granular endoplasmic reticulum, and evenly distributed ribosomes.

The organisms were remarkably similar to the amastigotes of L. donovani reported in other cases of canine visceral leishmaniasis. Although it has been reported that morphological criteria can be used to differentiate between species of Leishmania, other workers are of the opinion that the amastigote stages of these organisms are morphologically indistinguishable. Further investigations will therefore be necessary to identify positively the species of Leishmania described in the present study.

RABIES IMMUNE STATUS AMONG STUDENTS

Jennifer A. Spencer and P.G. Howell
Department of Infectious Diseases

For the past 10 years, students registered at the Faculty of Veterinary Science have been immunised with Merieux inactivated rabies vaccine. A survey was conducted to determine the immune response induced by this vaccine. The study was purely for research purposes and not a diagnostic procedure.

Serum samples were collected from 97 students who had received either a primary, or at least one booster inoculation. Rabies antibody levels were measured by an ELISA method and converted to international units for analysis.

The mean antibody level was seen to increase with each year of inoculation up to the 5th year when it showed a decrease among 5th and 6th year students. Unfortunately, sample sizes were small, resulting in inconclusive differences when analysed at the 95% confidence limits.

Protective immunity is generally accepted to be 0,5 Iu/ml or more. The majority of sera tested showed values greater than this protective minimum. Unfortunately, no pre-bleed sera were available for comparative purposes. Reasons for a poor sero-conversion could be genetic or due to a decreased potency of the vaccine.

GENETIC POLYMORPHISM IN THE BLOOD OF THE
NAMAQUA SHEEP BREED

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Much interest is currently being focused by conservationists on rare/indigenous breeds of sheep. Blood genetic markers provide a convenient means of characterising such breeds and enable comparisons to be made with breeds that have been highly selected for traits of economic importance. Data is presented on an indigenous African breed, the Namaqua, which has dwindled to near extinction. The last pure flock is kept at the Kleinfontein Experimental Station, Carnarvon, NW Cape.

Heparinised blood was collected from Namaqua sheep and processed within 96 hours of collection. Separated plasma was subjected to electrophoresis for transferrin (Tf), albumin (Al) and aryl esterase (Es A) typing. Whole blood was used for glutathione (GSH) analysis. Washed red cells were tested for potassium type (Ke), and blood group antigens, and haemolysates for nucleoside phosphorylase (NP), carbonic anhydrase (CA) and 'X' protein (X), haemoglobin (Hb), NADH-diaphorase (Dia), and lysine (Ly). Variants were compared with internationally recognised standards.

All samples tested contained the commonly-occurring albumin Al S phenotype, while 96% of the sheep displayed the common aryl esterase phenotype EsA-ve. Transferrin variants TfA, B, C and D were identified in the flock, TfD being the most frequent. The phenotype frequencies of the blood group factors are given. Factor Bv is included in the B system, despite lack of international recognition. No sheep were observed with Ab or Be antigenic factors, and in the C system Ca was present at an unusually high frequency. The Mb factor which is associated with the low potassium phenotype, was not present, all samples being of Ma or Mac phenotype. All samples tested contained X-negative, Ly-negative and Ca S phenotypes. GSH was bimodally distributed in red blood cells, where the concentration was <50 mg/100ml red cells in 44% of sheep. Red cell potassium concentrations showed an unusual distribution. All possible phenotypes were found at the diaphorase and nucleoside phosphorylase loci and both the common haemoglobin variants (HbA and HbB) were present, with HbB predominating. The isoelectric-focusing patterns of haemoglobin showed the presence in some samples of extra bands in the alpha position, probably representing a chain variant.

Although plasma potassium concentrations of these Namaqua sheep were typical of Lebanese fat tailed sheep, surprisingly the red cells were not lysine positive. Hence these red cells were not similar to those of Lebanese fat tailed sheep. Furthermore, the i bloodgroup was discovered in those sheep which normally lack the dominant secretor gene I and hence do not express either R or O blood group substances on their red cells. In an indigenous breed such as the Namaqua that has also been kept relatively isolated, it was disappointing not to find new genetic variants.

AN INVESTIGATION OF GENETIC MARKERS IN HIPPOPOTAMUS
AMPHIBIUS

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The purpose of this study was to investigate genetic marker variants in a South African hippopotamus population.

Blood was collected from 150 hippopotami in the Kruger National Park; sera only were investigated.

Horizontal starch gel electrophoresis (11-13%) was used for the detection of Am isoenzymes.

For two-dimensional horizontal electrophoresis, the 1st dimension separation was by agarose gel (pH 5.4 or pH 8.6) electrophoresis and the 2nd dimension by polyacrylimide (PA) gel electrophoresis (pH 9.0). Specific stainings to detect hemopexin, haptoglobin, ceruloplasmin, esterase and serine protease inhibitor fractions were applied to PA gels. Some PA gels were electroblotted in Immobiline membranes, and subjected to immunostaining, using rabbit-human hemopexin and immunoglobulin.

In three systems, more than one phenotype was displayed:

- in starch gel: Am with a one- or two-banded pattern, tentatively called A, B and AB
- in 2 dimensional Agarose-PA gel (pH 5.4 - pH 9.0):
 - PO1: a strong spot, accompanied by two weak spots, for a presumed homozygous type A or B, and a combination of two strong spots and two weak spots for a putative heterozygote.
 - PTf: a strong spot, accompanied by two weak spots for presumed homozygous A, B, C, C_F and D, and heterozygotes with two strong bands and two, three or four weak spots.

As Am isoenzymes migrate anodally, an allelic interpretation seemed possible to us. The observed distribution was not in agreement with the Hardy-Weinberg expectations, however.

No significant deviation was found for PO1 and PTf. Therefore, the results for these two are consistent with a Mendelian expectation for true polymorphism. Further investigation will be needed to identify the nature or function of these two systems.

A RETARDED IDENTICAL TWIN ATTACHED TO THE
UMBILICAL CORD OF A FULL TERM FOAL

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¹Department of Anatomy

During the routine examination of the placenta of a healthy full-term female foal, a pedunculated spherical structure 5 cm in diameter was found attached to the umbilical cord of the placenta. The structure had a hard wall, was filled with yellowish fluid and was attached by blood vessels to the vessels of the umbilical cord of the full-term foetus. The structure was enveloped by an evaginated pouch of the amnion of the full-term foetus.

Upon histological examination of the wall of this appendage, bone, fat, blood vessels and dense and loose fibrous connective tissue could be identified. Smooth muscle cells could be identified in the walls of arteries. Epstein-Barr bodies on the neutrophils indicated that this was tissue of a female foetus.

Only a single report of identical equine twins could be found in the scientific literature. All other twins were dizygous with each foetus having its own amnion and allanto-chorion. Since this appendage consisted of normal foetal tissue, was enclosed in the same amnion as the full-term foetus and was of the same sex as the full-term foetus, it is concluded that it constituted a retarded identical twin foetus.

CYCLICAL CHANGES IN EQUINE ENDOMETRIAL HISTOLOGY

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Department of Theriogenology

Cyclical changes in equine endometrial histology have not been systematically studied. A thorough understanding of this subject must precede histopathological studies.

Twenty-four mares of Nooitgedacht or Welsh Pony breeding were used for this trial. An endometrial biopsy specimen was obtained once from each mare on Day 0, 4, 8, 12, 16, or 20 after ovulation, as detected by daily rectal palpation of the ovaries. The site of biopsy was always the dorsal aspect of the base of the right uterine horn. Samples were divided and fixed in cacodylate-buffered glutaraldehyde, buffered formalin or 70% ethanol. For this study, glutaraldehyde fixed samples were embedded in epon resin, sectioned at 1 μ m and stained with Toluidine Blue. Sections of ethanol and formalin fixed samples were stained by periodic-acid-Schiff(PAS) and haematoxylin-eosin(HE) methods respectively.

Endometrial biopsy early in the luteal phase (Days 4 or 8) shortened the interovulatory interval, while biopsy late in the cycle (Days 16 or 20), lengthened the interovulatory interval.

The mean height of luminal epithelial cells was approximately 20 μ m during oestrus, increasing to 26 μ m by Day 4. The minimum height of 14 μ m was reached on Day 12. Peak mitotic activity of luminal epithelial cells was recorded on Days 20 and 0. The apices of luminal epithelial cells consistently stained positive by the PAS method. Migratory cells (mainly lymphocytes) were encountered within the luminal epithelium from time to time. Statistically significant differences in their number were not detected.

Glandular epithelial cells were significantly taller on Days 4 and 8 of the cycle than at other times. Cells closer to the uterine lumen tended to be taller than deeper-lying glandular cells. Mitotic activity of glandular epithelial cells was significantly higher on Day 4 than any other stage of the cycle. PAS activity of the glandular cells increased progressively during the luteal phase. The glandular luminal content was consistently PAS positive.

Mast cells and eosinophils were frequently encountered in the endometrial stroma. Mast cells were most numerous during the luteal phase (Days 4, 8 and 12). No cyclical variation in eosinophil numbers was detected. At no stage of the cycle was stromal PAS activity detected. Stromal vascularity and haemorrhage in the stratum compactum was greatest at Day 8 of the cycle. This casts doubt on the wisdom of the current practice of preferentially taking diagnostic endometrial biopsy specimens at this stage of the cycle. Clearly the luminal and glandular epithelia should be regarded as functionally separate cell populations in the mare. The possible effect of mast cells on embryo mobility deserves investigation.

PHYSIOLOGICAL AND BLOOD BIOCHEMICAL RESPONSES
TO TREADMILL EXERCISE IN DOGS OF DIFFERING FITNESS

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and H.T. Groeneveld¹
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This study was conducted to investigate selected physiological parameters which might be used as indices of fitness in dogs.

Eight related unfit Canaan dogs took part in a fortnight of experiments during which each dog ran on a treadmill (speed 8,65 km⁻¹ - brisk trot; inclination 10⁰) on 4 separate occasions. The following parameters were chosen as indices of exercise stress and recovery: pulse rate and rectal temperature were monitored during exercise. The following blood parameters were monitored before exercise, immediately after exercise, 20 min, 1 h, 3 h, and 24 h after exercise:

Plasma aspartate-aminotransferase and creatine-kinase activity (P-AST; P-CK), plasma lactate and glucose concentration (P-Lactate; P-Glucose), red and white cell counts (RCC; WCC), haemoglobin and total plasma protein concentration (Hb; TPP) and haematocrit (Hct). Mean change from resting level as a result of exercise was calculated for each parameter at each time of measurement.

The same experiment was then repeated for "fit" dogs (ie. dogs capable of running for 1 hour at the above-,mentioned treadmill settings).

High intrinsic variation in the blood biochemical and haematological parameters produced general conclusions only, when data from unfit and fit dogs were compared. There was a tendency for P-AST to peak earlier and decline more rapidly in fit dogs. P-CK levels were significantly ($p < 0,05$) lower at all times of measurement in fit dogs. There was no discernable difference between unfit and fit dogs in P-Lactate, Hct and RCC, while P-Glucose, TPP and Hb tended to be higher in fit dogs under the imposed experimental treatments. Pulse rate and rectal temperature showed less intrinsic variation and might be developed as quantitative indices of fitness in dogs. The distinct groups apparent for unfit dogs (characterised by time of run until fatigued, presence or absence of a plateau in readings and state of pulse recovery 5 min after exercise) were absent in fit dogs. Instead, all dogs conformed to a narrower pattern indicating that the poorer performers had improved with training.

In conclusion, improved fitness in the dogs was indicated by increased exercise tolerance due to improved cardiovascular and thermoregulatory efficiency, improved oxygen carrying capacity of the blood, decreased muscular stress and possibly improved glycogen storage capacity. Certain dogs showed inherent fitness superiority over others.

WILD LIFE PANEL: PAPER 1

THE UTILIZATION OF WILD ANIMALS

Dr R.G. Bengis
State Veterinarian,
Skukuza,
Kruger National Park.

During the past decade, the concept of conservation, which evolved from the earlier, and still necessary, approach of preservation of species, has undergone considerable change. In the past, wild animals were kept in nature reserves to ensure their survival for generations to come; it is now understood that the optimal utilization of wild species is the key to ensuring their survival. The establishment of game farming as a growing industry bares witness to this. Dr Roy Bengis will speak on the utilization of wild animals.

WILD LIFE PANEL: PAPER 2

GAME FARMING

Prof J. du P Bothma
Eugene Marais Chair,
Department of Zoology,
University of Pretoria.

The high prices obtained for rare species, the potential income from hunting and the development of export markets for meat and other products are becoming part and parcel of the conservation approach. Prof Bothma will discuss the problems encountered when farming with these animals.

WILD LIFE PANEL: PAPER 3

MASS VACCINATION OF FREE-RANGING LARGE WILD MAMMALS USING A
BALLISTIC IMPLANTATION SYSTEM

Dr V. de Vos
Kruger National Park.

Concern has been expressed at the possibility of the spread of Rinderpest from countries to the North, highlighting the importance of vaccination to protect wild ungulate populations. Dr de Vos will report on the development of vaccination techniques that are used in the control of anthrax in the roan antelope (Hippotragus equi) population in the Kruger National Park, and that can be used in most species.

WILD LIFE PANEL: PAPER 4

AN INTEGRATED APPROACH TO AN ECOLOGICAL PROBLEM:
CATS ON MARION ISLAND

Prof R. van Aarde
Mammal Research Institute,
Department of Zoology,
University of Pretoria.

Prof Van Aarde will cover aspects of the need for veterinarians to become more aware of the importance of studying the ecology of different organisms, both as a diagnostic tool, and as information necessary for the development of disease control strategies.

CLINICAL SCIENCES PANEL: PAPER 1

COMPUTERIZED TOMOGRAPHY IN SMALL ANIMAL BRAIN DISEASE

W.L. Berry
Department of Medicine

Computerized tomography (CT) is a non-invasive procedure that gives complete cross-sectional images of internal structure. Over the last 3 years, the Department of Medicine has been utilizing CT scanning as an aid to the diagnosis of brain disease. This facility is afforded the department by the kind co-operation of Medunsa and Garankuwa Hospital. Of the 18 neurological cases selected for CT scanning, 12 have had brain lesions confirmed by the procedure.

Conventional radiography records on X-ray film, X-ray beams passing through a patient. In computerized tomography, an axial or cross-sectional image is reconstructed from the recorded X-ray intensities by computer analysis. The radiologic image results from the different densities of tissues leading to an attenuation of the X-rays.

Initially, a scout scan is performed, which is similar to a lateral survey radiograph, and which allows positioning of the first and subsequent transverse slices. Each slice is numbered and recorded by a dotted line on the scout scan. For each slice, the X-ray tube emits multiple exposures of a finely collimated X-ray beam as it rotates around the patient. The intensity of the X-ray beam emerging from the patient is recorded by detectors and the information passed to the computer, where it is reconstructed into an image displayed on a screen. Intravenous contrast agents are often used to improve image contrast.

In interpreting CT scans, osseous extra- and intracranial structures are used as landmarks, as well as the neuroanatomical relationship of the ventricles to the brain tissue. Certain anatomical areas of brain tissue show slight differences in density. As with conventional radiography, CT scans show up low-density structures as black or dark areas, whereas high-density structures are seen as light grey or white. Brain tumours are dense, particularly after contrast administration, and are seen as light grey to white masses within dark grey brain tissue. Tumours also cause distortion or asymmetry of ventricles and, as they are filled with CSF, appear black on the CT scan.

The Department of Medicine is greatly indebted to Prof J. van Heerden of the Medunsa Veterinary Faculty, and the Superintendent and Radiography staff at Garankuwa Hospital for the use of the CT facility.

CLINICAL SCIENCES PANEL: PAPER 2

A LAPAROSCOPIC TECHNIQUE FOR INTRA-UTERINE INSEMINATION OF BITCHES

B.D.W. van der Merwe and H.J. Bertschinger
Department of Theriogenology

Artificial insemination of bitches using thawed frozen semen yields poor conception rate results, unless semen can be deposited in the uterus. Transcervical insemination to achieve uterine deposition is often difficult, especially in smaller breeds or bitches that are tense, which makes transabdominal location of the cervix almost impossible. Insemination of sheep with thawed frozen semen into the caudal os of the cervix also gives poor results. In recent years, a laparoscopic insemination technique, which yields excellent results, has been developed for sheep. In addition, the technique allows a fourfold reduction of the required sperm dose. This pilot trial was designed to develop a laparoscopic technique for intra-uterine insemination of dogs.

Maiden German Shepherd bitches (n=9), approximately 10 months of age, were used. Preparation and anaesthesia employed were similar to those required for routine hysterectomy. After insufflation of the abdomen, a laparoscope was introduced in the midline, 2 cm caudal to the umbilicus. The uterine horns were identified and a transcap/aspic assembly was fed through a second port in the midline, 6-10 cm caudal to the laparoscopic port. The aspic needle was stabbed through the wall of the right uterine horn into the lumen, where 1 ml India ink was deposited. The procedure was repeated on the other horn. The bitches were hysterectomized after the procedure.

Using this technique, India ink could be deposited into the uterine lumen of 8 of the 9 bitches. The uterus of the remaining bitch was too infantile to attempt insemination. Complications included trauma to the spleen (1 bitch), a minor aneurism (1 bitch) and penetration through the entire horn (6 bitches).

The success of the method, and the relative ease with which it can be performed, indicates that laparoscopic insemination may offer a solution as a means of intra-uterine insemination of the bitch. Penetration of the entire horn experienced in 6 bitches can be ascribed to the size of the uteri, and should not happen as easily in multiparous bitches. Shortening the aspic needle may also solve the problem. None the less, intra-luminal deposition of India ink was successful in 8 of 9 bitches.

CANINE ORTHODONTICS

F.J.M. Verstraete
Dental Clinic, Department of Surgery

Breed standards prescribe the desirable occlusion, which, for most breeds, is the scissor bite. The evaluation of the occlusion in the show ring is based mainly on the occlusion of the incisors. Occlusion abnormalities have traditionally been considered to be of genetic origin, and their possible correction, therefore, banned.

There has been a renewed interest, however, in the pathophysiology of malocclusion. There are indications that a number of malocclusion syndromes are caused by a delayed exfoliation of deciduous teeth. Notable examples are anterior crossbite, characterised by retrognathous upper incisors, and lingual deviation of the lower canines as a result of persistent deciduous canines. The etiology of retention of deciduous teeth is multifactorial and, although controversial, genetics would not appear to play a major role. Because of this, and because malocclusion leads to soft tissue trauma and early periodontal disease, treatment is indicated.

These conditions can, to a large extent, be prevented if proper attention is paid to the deciduous dentition. If an anterior crossbite is anticipated, extraction of the deciduous upper incisors is indicated. Most important, however, is that deciduous teeth should not be allowed to remain in the mouth when the eruption of permanent teeth is evident.

Anterior crossbite in permanent dentition can effectively be corrected with the use of a removable or semi-removable intraoral orthodontic appliance with a built-in expansion screw. The upper incisors are moved forward, while the upper canines are used as anchor points. Oral hygiene has been found to be a far greater problem than poor patient compliance. Lingually deviated lower canines can be moved in a buccal direction by using a non-removable wire spring appliance.

Orthodontic treatment in the dog is indicated for conditions that are unlikely to be of genetic origin. Restoration of normal occlusion is necessary to maintain periodontal health and may prevent a valuable show animal from being disqualified for inappropriate reasons.

VERWAGTINGS VAN DIE PRIVAAT PRAKTYK

P.H. le Roux
Richmond Dierehospitaal, Johannesburg

Fakulteit moet op hoogte wees van watter kliniese werk in praktyke gedoen word sodat die nuwe graduandi die nuutste metodes geleer word om sulke gevalle te hanteer.

Navorsing kan kwalik deur praktisyns gedoen word. Gevolglik moet die fakulteit self besluit watter areas van kliniese wetenskap nagevors moet word.

Praktisyns sal steeds graag gevalle verwys waar hulle apparaat en kundigheid te kort skiet mits hulle weet wat die fasiliteite binne die fakulteit is.

Toegang tot literatuur is vir praktisyns moeilik, dus sal dit waardeer word indien die fakulteit saam met hulp en raad in 'n spesifieke geval ook toepaslike bronne of herdrukke voorsien.

Opgradering van die kundigheid van praktisyns sal die beste gedoen word deur praktiese onderrig van die beste metodes van alledaagse prosedures. Hoewel 'n korrekte akademiese grondslag vir diagnose en behandeling nodig is, dien die voordra vandie fynere punte geen doel nie.

Geborg deur/Sponsored by Coopers Animal Health



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