



**UNIVERSITEIT VAN PRETORIA**  
Fakulteit Veeartsenykunde  
Faculty of Veterinary Science

**PROGRAM EN OPSOMMINGS  
PROGRAMME AND SUMMARIES**  
**2de Fakulteitsdag  
2nd Faculty day  
25 September 1985**



IIInd FACULTY DAY

VENUE:                   LARGE AUDITORIUM  
Faculty of Veterinary Science  
University of Pretoria

25th September, 1985

Sponsored by Wellcome/Coopers

Organising Committee

Prof JMW le Roux	-	Dean
Mr R Reynolds-Hale	-	Coopers Animal Health (Pty) Ltd
Prof WH Gerneke	-	Co-ordinator of Scientific Programme
Prof S van Amstel		
Dr GV Turner		
Dr B Penzhorn		

FAKULTEITSDAGPROGRAM 1985

08h00 - 08h30	Ontvangs van gaste	
08h30 - 08h40	Verwelkoming	Prof JMW le Roux Dekaan: Fakulteit Veeartsenykunde
08h40 - 09h00	Openingsrede	Prof HP van der Schijff Vise-rector
09h00 - 10h00	SIR ARNOLD THEILER GEDENKLESING	Prof HPA de Boom Professor emeritus
10h00 - 10h30	TEEPOUSE	

WETENSKAPLIKE PROGRAM

SESSIE I

TOKSIKOLOGIE

VOORSITTER : Prof JFW Grosskopf

- |               |  |
|---------------|--|
| 10h30 - 10h45 | 1. Chronic experimental aflatoxicosis (B <sub>1</sub> ) in dogs<br>Naudé TW, Bland van den Berg P, Reyers F and Tustin RC                                  |
| 10h45 - 11h00 | 2. The pathology of a natural outbreak of aflatoxicosis in dogs<br>Bastianello Stella S  |
| 11h00 - 11h15 | 3. Antibiotic serum activities against bacterial isolates<br>from cases of acute shipping fever in feedlot calves<br>Van Amstel S, Witcomb MA and Fabian B |
| 11h15 - 11h30 | 4. Experimental <u>Lasiospermum bipinnatum</u> poisoning in sheep :<br>some observations<br>Williams MC  |
| 11h30 - 11h45 | 5. Experimental studies of a new mycotoxicosis in ruminants<br>caused by <u>Drechslera campanulata</u><br>Collett MG, Schneider DJ and Marasas WFO         |

SESSIE II

REPRODUKSIE

VOORSITTER : Prof RI Coubrough/Prof HJ Bertschinger

- 11h45 - 12h00 6. Artificially induced capacitation of spermatozoa  
Oettlé EE
- 12h00 - 12h15 7. Fertility of equine semen frozen in 0,5 ml straws  
Volkman DH
- 12h15 - 12h30 8. Voorplanting van die Egiptiese Vrugtevlermuis Rousettus aegyptiacus  
Penzhorn BL en Rautenbach IL
- 12h30 - 12h45 9. Die plasenta van die klein geel dakvlermuis, Scotophilus viridis  
Van der Merwe NJ en Rautenbach IL
- 12h45 - 13h00 10. Integration of the transfer of frozen embryos with an AI programme in a beef herd with a limited breeding season  
Coubrough RI, Gilbert RO and Ehret WJ

13h00 - 14h00 MIDDAGETE/LUNCH

SESSIE III

MORFOLOGIE

VOORSITTER : Prof MMS Smuts

- 14h00 - 14h15 11. Die topografie van die thoraco-abdominale viscera van die volstruis  
Bezuidenhout AJ
- 14h15 - 14h30 12. Scanning electron microscopic observations of the gastrulation process in BrdU-treated chick embryos  
Soley JT
- 14h30 - 14h45 13. The arterial blood supply to the brain of the bovine embryo and foetus  
Louw GJ

SESSIE IV

GEBRUIK VAN REKENAARS IN NAVORSING

VOORSITTER : Prof PJ Howell

14h45 - 15h00

14. Die ontwikkeling van 'n program vir data kommunikasie met 'n draagbare rekenaar

Malan JH, Dowling MM en van der Linde MJ

15h00 - 15h15

15. Developmental research into the role of the microcomputer in elementary microbiology and veterinary immunology courses

Miller ES and Vermaak ME

SESSIE V

CHIRURGIESE PROSEDURES

VOORSITTER : Prof DG Steyn

15h15 - 15h30

16. Chirurgiese herstel van iliosakrale ontwrigting by die hond en kat

Verstraete FJM

15h30 - 15h45

17. Pulmonary shunt during general anaesthesia in the horse

Stegmann GF

15h45 - 16h00

TEEPOUSE/TEA

SESSIE VI

EPIDEMIOLOGIE

VOORSITTER : Prof RC Tustin

16h00 - 16h15

18. Cross-infestation of strongyles between wild and domestic Equids

Krecek Rosina C

16h15 - 16h30

19. The use of abattoir condemnation data in a pig herd health programme

Turner CV

16h30 - 16h45 16h20. Speenk aaliam afeksi by melkkoeie diagnose voorkoms,  
aard, terapie, omvang en betekenis  
Du Preez JH

16h45 - 17h00 21. The prevalence of antibodies to Legionella pneumophilla  
in the equine population of South Africa  
Wilkins CA and Bergh N

17h00 - 17h15 22. Rabies in South Africa : epidemiological trends for the  
period 1980 - 1984  
Gummow B and Turner GV

17h15 - 17h30 23. Wurms in winterreënvalstreek : Skape vrek in somer  
aan wurms onder die invloed van goeie reëns  
Reinecke RK

17h30 AFSLUITING : DEKAAN, FAKULTEIT VEEARTSENYKUNDE

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CHRONIC EXPERIMENTAL AFLATOXICOSIS (B<sub>1</sub>) IN DOGS  
T W NAUDÉ\*, P BLAND VAN DEN BERG\*\*, F REYERS\*\* AND  
R C TUSTIN\*\*\*

Departments of \*Physiology, Pharmacology and Toxicology, \*\*Internal  
Medicine and \*\*\*Pathology, Faculty of Veterinary Science,  
University of Pretoria

An extensive outbreak of suspected aflatoxicosis in dogs was traced to a commercial brand of dog pellets containing from c. 100 to 300 ppb (µg/kg) aflatoxin in different batches. The allowable upper limit in dogfood in South Africa is 50 ppb.

Only data on the acute LD of aflatoxin in dogs could be obtained. This was in the order of 0,5-1 mg/kg in single doses.

A pilot trial was conducted with 3 groups of beagles (a dog and bitch in each group). Zero, 250 ppb and 500 ppb aflatoxin B<sub>1</sub> was artificially mixed into a known aflatoxin-free commercial dogmeal and fed to them for a maximum of 6 months.

The control group was unaffected. At 500 ppb both dogs died rather suddenly c. 2 months after total cumulative dosages of 0,6 and 1,2 mg aflatoxin B<sub>1</sub>/kg had been fed to the dog and bitch respectively. At 250 ppb the dogs succumbed after 5½ and 7 months at cumulative dosages of 0,9 and 1,8 mg/kg in the dog and bitch respectively.

Aflatoxicosis was confirmed macro- and histopathologically. Clinical chemistry on the 500 ppb group revealed one severe, lethal bout of hepatocellular disease. The 250 ppb group showed several bouts of hepatocellular damage with progressively decreasing maximum enzyme levels.

If the published acute LD in dogs is compared with the chronic LD obtained in this pilot experiment, aflatoxin B1 appears to be significantly cumulative in this species.



THE PATHOLOGY OF A NATURAL OUTBREAK OF AFLATOXICOSIS  
IN DOGS

STELLA S BASTIANELLO

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The gross and histopathological lesions encountered in 10 dogs that died naturally over a period of 3 months as a result of aflatoxin poisoning are presented.

Complete post mortem examinations were performed. Specimens were collected from selected organs in a 10% buffered formalin solution. These were routinely sectioned and stained with haematoxylin and eosin (HE). Selected sections were furthermore specifically stained for collagen, haemosiderin, bilirubin and lipofuscin.

The macroscopic pathology included icterus, anaemia, generalised oedema manifested by ascites, hydrothorax, hydropericardium, anasarca and pulmonary and lymphnodal oedema; and, enterorrhagia or to a lesser extent gastro-enterorrhagia. In all cases, the liver was fatty and yellow in colour. Only in 2 cases was there evidence of nodular regeneration.

From the histopathological examination, 1 case could be regarded as acute, 7 as subacute and 2 as chronic. In the acute cases, the histopathological features included severe fatty hepatic degeneration with focal lytic necrosis, congestion, mild biliary stasis and the accumulation of round cells, principally lymphocytes in the portal triads. The principal distinguishing feature of the subacute cases was a prominent and extensive bile ductule proliferation. There was also varying degrees of fatty degeneration, isolated necrotic hepatocytes and moderate bile stasis. Extensive fibrosis was the chief lesion of the chronic cases together with bile duct proliferation and severe architectural disruption, but only mild fatty changes. Necrosis and mucoid degeneration of the epithelium of the larger pre-existing bile ducts was seen in almost all the cases whether acute, subacute or chronic.

/A reasonably ...

A reasonably accurate diagnosis of aflatoxicosis can be made, based on the hepatic histopathology, specifically fatty degeneration, bile ductule proliferation and necrosis of the epithelium of the larger pre-existing bile ducts.

ANTIBIOTIC SERUM ACTIVITIES AGAINST BACTERIAL ISOLATES FROM CASES OF  
ACUTE SHIPPING FEVER IN FEEDLOT CALVES

S VAN AMSTEL, M A WITCOMB\* and B FABIAN\*

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\*Department of Infectious Diseases

Antibiotic serum activities were assayed on sera obtained from calves suffering from acute shipping fever against tracheal wash bacterial isolates from the same calves. Results of these serum activities were compared with

- i) the clinical course of the disease and
- ii) antibiograms using the same antibiotics and bacterial isolates.

Serum activity tests were conducted in 3 groups of 7 calves with acute shipping fever as follows:

Low tracheal washes for bacterial isolation were carried out on each calf with the aid of a fiberoptic endoscope. Three treatment regimes were then used: Group 1 received oxytetracycline for 3 days; Group 2 received procaine penicillin for 3 days and Group 3 received procaine penicillin on day 1, a sulphonamide on day 2 and oxytetracycline on day 3. The calves were bled daily at 4, 10 and 24 hours after administration of the antibiotics. Four isolates of Pasteurella haemolytica were tested against the antibiotic activity of all the sera so collected. These results were compared with those obtained from in vitro disc sensitivities.

Results obtained were as follows:

Sera from calves in Group 1 showed little activity against 3 of the isolates tested and moderate activity against one. This correlated with results of the disc sensitivities and the clinical course of the disease. Sera from calves in Groups 2 and 3 showed similar activities against the isolates as those in Group 1. This did not correlate with the disc sensitivities. Calves in Group 2 showed a protracted clinical recovery while those in Group 3 recovered more rapidly.

EXPERIMENTAL LASIOSPERMUM BIPINNATUM POISONING IN SHEEP:  
SOME OBSERVATIONS

M C WILLIAMS

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University of Pretoria

Lasiospermum bipinnatum is a hepatotoxic plant belonging to the family Asteraceae. Outbreaks of poisoning in sheep and cattle occur periodically in the eastern Karroo and eastern Orange Free State. Based on a limited number of experimental observations the hepatic lesion has been described as a characteristic peripheral fatty degeneration and necrosis of the liver lobule. The purpose of the present experiments was to investigate fully the lesions, particularly as these relate to dosage levels of the plant.

Nine young Mutton Merino sheep were experimentally poisoned with shade-dried, milled Lasiospermum bipinnatum (Ganskweek) collected near Graaf-Reinet and near Cradock in the eastern Cape. Two sheep were used as controls. The animals were dosed per stomach tube at rates of dried plant varying from 1 g/kg to 12 g/kg liveweight every day. Blood was collected at regular intervals by jugular puncture in order to evaluate hepatic damage. Serum levels of gamma-glutamyl transferase, glutamate dehydrogenase and, in some instances, sorbitol dehydrogenase were determined.

Sheep receiving doses of 6 g/kg and higher died within a week whilst those dosed 4 g/kg and less were killed by intravenous barbiturate administration after about two weeks. Most of the latter group showed no overt clinical signs of illness although lesions were indicated by serum enzyme analyses and demonstrated at autopsy. The most striking sign observed in the sheep given high doses of the plant was terminal dyspnoea characterised by marked inspiratory and expiratory effort. Several hours before death some of these animals developed a serous to frothy nasal discharge.

/At autopsy ...

At autopsy the most obvious lesions were found in the liver (hepatosis) and lungs (interstitial pneumonia and emphysema). Hepatic lesions varied with dose level and were present in all poisoned sheep while pulmonary lesions occurred only in those sheep with plants collected from near Cradock. The severity of the lung lesions appeared to be related to the dose level of the plant.

Pulmonary lesions have not been reported before in either natural or experimental Ganskweek poisoning. Under experimental conditions the liver lesion is not always located at the periphery of the lobule, a finding hitherto regarded as of considerable diagnostic importance.

EXPERIMENTAL STUDIES OF A NEW MYCOTOXICOSIS IN RUMINANTS  
CAUSED BY DRECHSLERA CAMPANULATA

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Drechslera campanulata was isolated from leaf spots on green oats associated with field outbreaks of diarrhoea and liver pathology in goats (Klipheuwel, August, 1982), and diarrhoea and milk-drop in dairy cattle (Riebeek West, September, 1983). Hepatic biliary crystalloid material, resembling that seen in Geeldikkop and Panicum photosensitivity, was found on histopathology of the goat livers. Birefringent crystals of a different nature were seen in various stages of formation, centrilobularly within central veins and elsewhere in liver lobules. No detailed examinations were done on goats that died of the diarrhoea syndrome and all the dairy cows survived following withdrawal of the affected oats.

D. campanulata is a pathogen of oats and many other cereals and grasses in RSA and elsewhere.

Cultures of D. campanulata, grown on maize meal, were dosed to calves, sheep and goats. In all 3 species, dosages ranging from 2,5 g/kg to 8 g/kg produced diarrhoea and elevated liver enzymes.

Characteristic lesions were found in the forestomach, abomasum and caecum. Hepatosis and nephrosis were also seen, the severity depending upon the dosage and duration.

Discussion will include the possible role of this fungus in "green oats poisoning" in the W. Cape, "Stellenbosch photosensitivity" and interesting similarities to Kikuyu poisoning and, with reference to the liver crystals in the original outbreak, Geeldikkop and Panicum photosensitivity.

## ARTIFICIALLY INDUCED CAPACITATION OF SPERMATOZOA

E E OETTLÉ

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Mammalian spermatozoa must undergo certain changes while residing in the female reproductive tract before they acquire the ability to fertilise ova. These changes, which involve both capacitation and the acrosome reaction, may be artificially induced by incubating sperm in defined media. In vitro fertilisation may be procured by placing mature ova in the presence of capacitated spermatozoa.

Freshly ejaculated dog semen was incubated in a previously defined medium for 7 hours. To assess acrosome status, thin smears as well as samples for electron microscopy were taken at hours 0, 1, 3, 5, 7 and 24. Motility estimates were also made on each occasion using phase contrast microscopy. Electron micrographs were compared with photomicrographs of the Spermac stained smears to evaluate the morphological picture observed with the light microscope with the membrane changes seen on electron microscopy. The results of this comparison indicate that some of these changes may be recognised with greater certainty on light microscopy. This allows the more accurate assessment of the potential of a sample to fertilise than was previously possible using only light microscopical examination. Furthermore, the pattern of changes observed during the induced capacitation and acrosome reaction experiments permitted comparison with and therefore differentiation from morphological changes arising from traumatic or other non-physiological reactions.

## FERTILITY OF EQUINE SEMEN FROZEN IN 0,5 ml STRAWS

DIETRICH H VOLKMAN

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In an earlier experiment it was established that layering 0,25 ml of a hyperosmotic EDTA based solution below diluted semen in 50 ml centrifugation tubes before centrifugation held no advantage over centrifugation without EDTA solution when measured against post-thaw progressive motility or acrosomal integrity of frozen equine semen.

The present trial was designed to evaluate the fertilising capacity of semen frozen by both methods. Optimal insemination time, as well as the number of inseminations necessary to achieve satisfactory conception rates were also investigated.

0,5 ml Straws were used. Each straw contained from  $200 \times 10^6$  to  $300 \times 10^6$  spermatozoa of which at least 30% were progressively motile after thawing. 2 Straws were used per insemination. Straws were thawed at 75°C for 6 s and then transferred into a waterbath at 37°C. Lengthened bovine AI pistolettes were used for AI. The tip of the pistolette was introduced into the vagina and carried to the cervix encusped in a sterile-gloved hand. The tip of the pistolette was then guided through the cervix using an index finger. The semen was deposited in the body of the uterus. Strictest hygiene precautions were observed throughout the insemination procedure.

22 Mares in their natural breeding season were teased daily. Once behavioural signs of oestrus were shown by the mares, daily rectal palpations of the internal genitalia were carried out. The anticipated time of ovulation was predicted in each case by referring to prior records of the mares' cycles. The precise time of ovulation was then established on rectal palpation. Only 2 inseminations during a given oestrus period were permitted in terms of the trial protocol. It was attempted to carry out these inseminations within 48 hours of ovulation (as established by rectal examination). Each mare was given 2 cycles to conceive, before being eliminated from the trial.



1 Out of 2, 2 out of 3, 15 out of 28 and 0 out of 5 mares conceived after having been inseminated 48 hours before, 24 - 47 hours before, 1 - 23 hours before and just after ovulation respectively. Overall pregnancy rates were 82% for mares inseminated with semen frozen by both methods used. It was significant to note, however, that single cycle conception rates were 41% and 73% for mares that were inseminated with  $\leq 200 \times 10^6$  and  $> 200 \times 10^6$  progressively motile sperm per insemination respectively.

VOORPLANTING VAN DIE EGIPTIESE VRUGTEVLERMUIS Rousettus aegyptiacus

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Vlermuise toon besonder interessante voortplantingstrategieë, wat o.a. spermstoring in die vroulike geslagstelsel na paring, vertraagde implantasie en vertraagde embrionale ontwikkeling insluit. Omdat hulle klein is, kan hulle maklik bestudeer word deurdat bv. seriesneë die hele vroulike geslagstelsel gemaak kan word. Hulle kan ook moontlik as modelle fisiologiese studies dien mits hul basiese voortplantingspatrone bekend is.

As deel van 'n intensiewe navorsingsprojek oor die ekologie van ses vlermuisoorte by Pafuri, Nasionale Krugerwildtuin, is die voortplanting van die Egiptiese vrugtevlermuis Rousettus aegyptiacus ondersoek. Vyf wyfies en vyf mannetjies is maandeliks vir 24 maande versamel.

Paring vind in die winter plaas, van Junie af, gevolg deur direkte embrionale ontwikkeling. Die draagtyd is sowat 3½ maande. 'n Enkele kleintjie, wat vir 'n paar weke aan die wyfie bly vasklou, word in die vroeë somer gebore.

In Oos-Afrika, waar daar jaarlike twee reënseisoene is, teel hierdie vlermuise twee keer per jaar. Hul voortplantingstrategie is dus by die heersende ekologiese omstandighede aangepas.

DIE PLASENTA VAN DIE KLEIN GEEL DAKVLERMUIS SCOTOPHILUS VIRIDIS

N J VAN DER MERWE\* en I L RAUTENBACH\*\*

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Scotophilus viridis kom voor in die savanna-bosveld, is insekvretend en is nie-hibernerend. Daar is niks bekend oor die voortplanting van hierdie spesie nie.

Materiaal is op 'n maandelikse basis versamel te Pafuri, Nasionale Kruger-wildtuin, deur gebruik te maak van nette.

Die geslagstelsels is uitgedissekteer en in formalien gefikseer vir lig-mikroskopiese ondersoek. Materiaal is ook versamel vir elektron mikroskopiese ondersoek. Die wyfies wat in September en Oktober versamel is, was duidelik dragtig. Tweelinge is die reël by S. viridis.

In die laboratorium is paraffiensneë gemaak, gekleur met Haematoxlin en Eosin sowel as met die P.A.S. metode. 'n Aantal sneë is ook gekleur volgens die swawelsuur-toluidine-blou metode van Sulkin.

Die plasenta van die klein geel dakvlermuis kan as volg geklassifiseer word:

- 1) Ontwikkeling is sentraal
- 2) Die plasenta is diskoïdaal
- 3) Allantochorionies
- 4) Hemodichoriaal - Die sitotrofoblast bly bestaan as 'n dun uitgerekte sellaaq proksimaal aan die sintrofoblast. Die maternale endoteel verdwyn maar nie die basaal lamina van laasgenoemde nie. Die betrokke basaal lamina ontwikkel porieë waardeur sitoplasmiese prosesse van die sintrofoblast stoot om so die maternale bloedvat geheel uit te voer.

INTEGRATION OF THE TRANSFER OF FROZEN EMBRYOS  
WITH AN A I PROGRAMME IN A BEEF HERD WITH A  
LIMITED BREEDING SEASON

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The wider implementation of embryo transfer depends on several factors. Most certainly a ready source of embryos for "batch" transfer will be high on the list, as will be the availability of suitable recipient cows. Both these factors are of course closely linked to the cost effective application of this breeding technique.

With this in mind, a trial was drawn up whereby embryos would be collected from specially selected donor cows, carefully classified using morphological criteria, and frozen using documented techniques. After a period of storage in liquid nitrogen the embryos would be used for non-surgical embryo transfer into suitable recipient cows.

The herd selected to provide the recipient cows consisted of 136 multiparous cows. Some 80 potential recipients were pre-selected on examination of their genital tract status, and body score. They were treated with prostaglandins to synchronise their metoestrus periods to be between 7 and 8 days at the time of non-surgical embryo transfer. This period fell over a time span of three days which preceded the scheduled 60d AI breeding season of the herd. After transfer the cows were closely observed for heat, but given a 3 week period of grace before being inseminated at an observed heat.

Embryos were transferred to 54 cows, 13 holding the transferred embryo. The remainder returned to heat and were bred by AI in the normal routine of the breeding programme. The overall conception in the herd was 75%. 82 Cows had AI alone with 73% conceiving while of the 54 in the ET + AI group, 42 finally conceived giving a percentage of 77%. The overall conception results compared very favourably with the other herds on the farm being in fact the highest recorded during the current season.

/Comparing ...

Comparing the calving to conception data of the AI groups alone with that of the ET + AI group, it was noted that in general the spread in the two groups is very similar. Obviously a batch of ET cows had their calving to conception date delayed, but they still fell well within the herd bounds as delineated by the limited 60 day breeding season.

The data presented clearly shows that embryo transfer using a ready source of embryos can be successfully integrated into a routine breeding programme without undue disruption. The additional managerial procedures necessary in fact heighten overall herd observation thereby offsetting the increased effort. In terms of the provision of recipients under well managed circumstances which is so essential to the success of ET the economic advantages would seem to override any disadvantage. The fact that those recipients that do not conceive to ET can be included in a normal AI programme without significant disruption or lengthening of their calving to conception interval as contained within the bounds of the breeding season, also highlights the cost efficiency of the concept of dual use of the herd for ET combined with AI.

## DIE TOPOGRAFIE VAN DIE THORACO-ABDOMINALE VISCERA VAN DIE VOLSTRUIS

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Veeartse in Suid-Afrika word dikwels gevra om nadoodse ondersoeke te doen op volstruise. Daar bestaan egter geen literatuur oor die topografie van die thoraco-abdominale viscera waarmee die veearts homself kan oriënteer nie. Omdat die topografie so baie verskil van dié van die hoender, is twintig volstruise ondersoek om die topografie van die viscera te bepaal.

Die longe van die volstruis vul die dorsale derde van die toraks. Dit word begrens deur die werwelkolom, vertebrale ribbes, cervikale lugsak en kliermaag. 'n Pleurale holte is afwesig. Die hart lê in die kranioventrale deel van die toraks met sy lengte-as loodreg tot die lengte-as van die liggaam. Dit word begrens deur die sternum, sternale ribbes, lewer en klavikulêre lugsak.

Die lewer lê in die hepatiese peritoneale holtes tussen die hart en spiermaag in die koudo-ventrale deel van die toraks. 'n Galblaas is afwesig.

Die groot, sakvormige kliermaag lê in die linker kraniale abdomen terwyl die ronde spiermaag die kranioventrale abdomen tussen die lewer en kliermaag vul. 'n Worsvormige milt lê net kraniaal van die regter nier tussen die cardia van die proventriculus en koudale vena cava. Die pankreas lê tussen die twee bene van die lusvormige duodenum wat van regs na links strek oor die ventrale abdomen. Die sterk gekronkelde jejenum en ileum vul die ventro-koudale abdomen en pelvis, terwyl die dorsokoudale abdomen gevul word deur die gekronkelde rectum. Die twee ceca lê aan weerskante van die terminale ileum en strek tot in die pelvis.

Die niere lê ventraal van die sinsacrum vanaf die laaste vertebrale rib tot die pelvis, met die gonade ventro-lateraal van die niere.



SCANNING ELECTRON MICROSCOPIC OBSERVATIONS OF THE GASTRULATION PROCESS  
IN BrdU-TREATED CHICK EMBRYOS

JOHN T SOLEY

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University of Pretoria

The thymidine analogue 5-bromodeoxyuridine (BrdU) is known reversibly to inhibit differentiation, but not cell division, in a number of cell types. This compound causes atypical primitive streak (PS) formation in the chick as seen by light microscopy. This event has been studied using the scanning electron microscope (SEM) in an attempt to determine whether or not any changes in cell shape or cellular organization can be detected in BrdU-treated embryos. Freshly laid fertilized chicken eggs were treated with two different concentrations of BrdU ( $3 \times 10^{-2} \text{M}$  or  $3 \times 10^{-3} \text{M}$ ) by injecting 0,35 ml into the air sac of each. Control eggs were similarly treated with 0,35 ml chick embryo saline. Blastoderms of the desired developmental stage were harvested and prepared for SEM using standard procedures.

The control blastoderms showed features typical of PS development. In contrast, BrdU-treated blastoderms displayed an atypical PS lacking a primitive groove or folds, and consisting of a disorganized aggregation of mesenchymal cells bulging into the sub-blastodermic cavity. The shape and appearance of the invaginating cells and their cytoplasmic extensions were similar in the control and BrdU-treated blastoderms. In control embryos the invaginating flask-shaped cells were confined to the immediate area of the PS whereas those in the treated embryos extended over a wide region of the epiblast.

These findings suggest that BrdU affects the mechanism whereby invaginating cells are restricted to the PS region of the epiblast. This interference allows cellular ingression to occur over a wider area resulting in a disorganized accumulation of mesenchymal cells beneath the atypical PS.

## THE ARTERIAL BLOOD SUPPLY TO THE BRAIN OF THE BOVINE EMBRYO AND FOETUS

G J LOUW

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University of Pretoria

The aim of this research is to fully describe the development of all arteries that supply the cerebrum with blood in the bovine foetus. This paper concerns the recognition, histologically, of certain important vessels to the brain in young embryos, from 19 days old and with 3 somites, through to older foetuses, at 1 to 1½ months of age. Serial sections of these embryos were made and stained with hematoxylin and eosin. It is possible to pinpoint arteries in the sections through the brain, which will be responsible for ramifying extensively throughout the cerebral hemisphere, cerebellum, and brain stem.

In order to explain the detailed supply to the cerebral hemispheres, macroscopic dissections of bovine foetuses fixed in formalin and with the arterial system filled with red latex, have been made and photographed. Information about the arteries contributing to the Rete mirabile epidurale rostrale and caudale, which is characteristic of the bovine, will be given. Details of the branches of the Arteria carotis interna follow, of which the extra-cranial portion regresses in the young calf. Vessels supplying the cerebral hemispheres will be studied, namely the Arteria cerebri rostralis (with its artery to the Corpus callosum, and the A. marginalis), Aa cerebri media and caudalis, and A. choroidea rostralis.

Future study will bridge the gap between the microscopic, early stages of development described, and the developed situation in the neonate which is well documented. Of main concern will be the ramifications of vessels in association with the developing sulci and gyri of the cerebrum.



## ONTWIKKELING VAN 'N PROGRAM VIR DATAKOMMUNIKASIE MET DRAAGBARE REKENAAR

JAN H MALAN, M M DOWLING en M J v d LINDE

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Die inwin, verwerking en oordra van data in Veeartsenykunde neem baie tyd in beslag. Eksperimentele en praktykdata vir die Veearts kan baie maklik onbeheerbare getalle bereik. In die oordra van data vanaf drukgang, stal en laboratorium na papier, na rekenaar en voor finale verwerking kan baie foute gemaak word. Die oorskryf en oordra van data moet beperk word om menslike foute uit te skakel.

Om die probleme van data-oordrag te verminder is die Epson HX-20 draagbare rekenaar met 32K geheue, 12K Ram en RS-232 serieskakelingspoort gebruik. Die Epson HX-20 koppel aan die IBM-XT en mbv Irmakaart aan die hoofraam van Universiteit van Pretoria.

Die programmatuur vir datavaslegging op die Epson HX-20 is geskryf in Basic en die ontvangs van data op IBM-XT in Basic A.

In die hondefiksheidseksperiment word data vasgelê direk op die rekenaar en oorgedra na die hoofraam. Die statistiese ontledings en grafieke word deur die hoofraam rekenaar gedoen.

Die data vasgelê word vanaf die laboratorium oorgedra na die hoofraam sonder enige papierwerk tussenin. Verwerking van data kan gedoen word deur die Epson HX-20, IBM-XT en hoofraam. Die rekenaar was gebruik gaan word vir verwerkings sal bepaal word deur die tipe verwerkings wat gedoen moet word.

DEVELOPMENTAL RESEARCH INTO THE ROLE OF THE MICROCOMPUTER IN  
ELEMENTARY MICROBIOLOGY AND VETERINARY IMMUNOLOGY COURSES

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The increase in number of veterinary students per lecturer has further compounded the need for more individualised instruction in the Veterinary curriculum. Methods to integrate modern teaching aids such as the computer into the curriculum have to be investigated.

A class of 27 veterinary nurses was chosen for investigating the theory and practice of integrating the microcomputer as part of their Elementary Microbiology Course and as a model for the development of a computer assisted Veterinary Immunology Course for veterinary students. Optimal integration of the microcomputer with the various aspects of each course entailing an insight frame, the study guide, the handbook and other sources, the lecturer and student was studied by allocating to each those functions which it could best perform. An authoring language was used for writing the computer course material while keeping the project practically within reach of lecturers with no programming knowledge. Being a voluntary part of their course, the success of the project was measured by the active participation and interest of students, by their continued improvement during the course (through regular self-tests) as well as the results in a formal semester test written at conclusion of the course.

The microcomputer made it possible to teach and test individual students interactively while the lecturer was free to do other work. It was concluded that the computer should be an essential part of the equipment of every educationalist while the experience gained in this study could be used in further development of the veterinary immunology course as well as any other computer based course.

CHIRURGIESE HERSTEL VAN ILIOSAKRALE  
ONTWRIGTING BY DIE HOND EN KAT

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Die iliosakrale gewrig is 'n struktuur wat opvallend min aandag in die veterinêre literatuur ontvang het, veral wat anatomiese aspekte asook kliniese afwykings betref. Die feit dat hierdie gewrig weinig beweging toelaat speel hierby seker 'n belangrike rol. Troumatiese iliosakrale ontwrigting daarenteen, is 'n toestand wat redelik dikwels by die hond en kat voorkom, en met erge funksionele simptome gepaard gaan. Die bestaande metodes van chirurgiese herstel van iliosakrale ontwrigting is nie bevredigend nie.

Die doel van hierdie studie was om 'n praktiese operasiemetode te ontwerp wat bevredigende resultate gee in terms van funksionele herstel, en beperking van komplikasies en operasierisiko. Daar is 41 honde en 13 katte met 'n iliosakrale ontwrigting in die studie opgeneem. 'n Oorsig van die voorkoms, etiologie, kliniese simptome en radiologiese bevindings word gegee. Aandag is geskenk aan 'n klassifikasie van iliosakrale ontwrigtings en aan die lokalisasie van bygaande pelvisfrakture.

Konserwatiewe behandeling is by 13 pasiënte toegepas. By 27 gevalle is die iliosakrale ontwrigting chirurgies herstel met behulp van Kirschnerdrade. Die teoretiese agtergrond van hierdie metode word bespreek. Die chirurgiese benadering en besonderhede van die tegniek word beskryf. Alhoewel die konserwatiefbehandelde pasiënte minder erg beseer was, was die herstelperiode by hierdie groep aansienlik langer as by die chirurgiesbehandelde pasiënte. Uiteindelik het al die pasiënte bevredigend herstel. Die radiologiese bevindings word bespreek. Migrasie van Kirschnerdrade kom dikwels voor maar het geen ernstige gevolge nie. Die res van die pasiënte is pre- of postoperatief oorlede of opgeoffer. Die postmortem bevindings word bespreek.

Dit was nie moontlik om 'n iliosakrale ontwrigting met dieselfde simptome as die kliniese gevalle eksperimenteel by honde te verwek nie. Die aanwesigheid van erge trauma aan die bekkenpiere by kliniese gevalle en die afwesigheid hiervan by gevalle wat eksperimenteel verwek is, mag moontlik hierby 'n belangrike rol speel.

## PULMONARY SHUNT DURING GENERAL ANAESTHESIA IN THE HORSE

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During general anaesthesia large differences are seen between alveolar and arterial oxygen partial pressures in the horse. These values are much larger than the differences seen in other species such as the dog or human during similar circumstances.

The purpose of this experiment was to obtain more information on the nature of this cardio-pulmonary abnormality and the role abnormal body position plays in the development of these changes.

In the study six thoroughbred horses were used to examine the effect of abnormal body position during general anaesthesia on cardio-pulmonary function. Arterial and mixed venous blood samples, mixed expired and end-tidal gas samples were collected to determine cardiac output, alveolar ventilation, alveolar deadspace, venous admixture and pulmonary shunts.

This study has shown that general anaesthesia leads to cardio-pulmonary depression in the horse. In the lateral position pulmonary function is reduced by increased venous admixture mainly due to ventilation-perfusion disturbances. In the dorsal position pulmonary shunt is the main cause of increased venous admixture when pure oxygen is used in the inspired gas mixture.

## CROSS-INFESTATION OF STRONGYLES BETWEEN WILD AND DOMESTIC EQUIDS

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The cross-infestation of strongyles between wild and domestic equids has not previously been studied. Forty-five Burchell's zebras, twenty-one mountain zebras and twenty-four horses from different habitats in Southern Africa were examined for endoparasites and the total nematode burdens determined. Seven nematode families were represented by 17 genera and 40 species and of these, the Strongylidae represent half of the total species. Some strongyle species were found in all three equids while other strongyle species appeared to be restricted to the horse or to a zebra species. At Etosha, for example, where the two zebras share the same habitat, cross-infestation appeared to occur. Strongyles which infested only one zebra species in other study areas, infested both species in Etosha. These included the following small strongyles (cyathostomes): Cyathostomum Alveatum, Cyathostomum montgomeryi, Cylicocyclus triramosus, Cylicostephanus bidentatus, Cylicostephanus calicatus, Cylicostephanus minutus; a new large strongyle species of Triodontophorus and a habronematid, Draschia megastoma.

To determine whether cross-infestation occurs, Shetland foals were infested with infective larvae of large and small strongyles cultured from the ingesta of both zebra species. Preliminary studies reveal that some strongyle species recovered from the donor zebras were also recovered from the Shetland foals and include: Cylicostephanus calicatus, Cylicostephanus minutus, Poteriostomum ratzii and Triodontophorus serratus. However, those strongyle species restricted to the zebra have not been recovered from the Shetland.

## THE USE OF ABATTOIR CONDEMNATION DATA IN A PIG HERD HEALTH PROGRAMME

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Production losses associated with subclinical and chronic diseases have become increasingly important in modern intensive pig herds. Such conditions are not immediately apparent to the producer on the farm and, in order to optimize production, various methods must be employed to monitor the health status of a pig herd.

A double-blind study was conducted. Post-mortem findings of pigs at an abattoir were recorded and the data collected from 2 640 pigs, marketed by 28 individual producers, was analysed and evaluated. Pneumonia, nephritis and parasitic liver lesions were the most significant findings. Subacute pneumonia being the most prevalent condition diagnosed. The percentage of pigs with pneumonia marketed by the 28 producers ranged from 0 - 62 % respectively. Epidemiological investigations were carried out on the relevant farms, where it was established that the producers were unaware of these diseases in their pig herds. Additional analyses showed a close correlation between the prevalence of the subclinical diseases diagnosed, age and body weight of the pigs at the time of marketing. Furthermore the presence of these diseases were of economic significance.

Subclinical conditions and diseases are of economic importance to pig producers and are often first diagnosed at the abattoir. It is therefore suggested that abattoir condemnation data should be used as an integral component of a pig herd health programme.

SPEENKANAALINFEKSIES BY MELKKOEIE: DIAGNOSE, VOORKOMS, AARD, TERAPIE  
OMVANG EN BETEKENIS

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Ondersoek is ingestel na die diagnose, voorkoms, aard, terapie, omvang en betekenis van speenkanaalinfeksies (SKI) by melkkoeie.

Aseptiese speenkanaaldepper-, voormelk- en speenwandpuntuurmonsters (SKDM, VMM, SWPM) is geneem van lakterende koeie vir sitobakteriologiese ondersoek met faagtipering op koagulasepositiewe staphylococci en serotipering op Streptococcus agalactiae en die bepaling van beesserum-albumieninhoud van sekere melkmonsters. Speendoping met chloorheksidien-glukonaat is toegepas. Speenkanaalterapie is toegepas met minimale hoeveelhede antibiotika.

Verskeie mastitispatogene bakterieë (waarvan koagulasenegatiewe staphylococci (KNS) die algemeenste voorkom), grondbakterieë, saprofiete en fungi koloniseer die speenkanaal. Die voorkoms van SKI, gediagnoseer op grond van die bakteriologiese resultate van die speenkanaaldeppermonster (SKDM), is gemiddeld 20% hoër as die voormelkmonster (VMM) geklassifiseer volgens die "International Dairy Federation" (IDF) se kriteria. Meesal word speenkanale deur 'n enkele bakteriese spesie gekoloniseer.

#### Conclusions

1. Only with TCSS/SKDM can TCI/SKI be diagnosed accurately.
2. Clinical mastitis is more prevalent in herds with a high prevalence of TCI than in those with a low prevalence of TCI.
3. Some bacterial species (Staph. aureus and P. aeruginosa) survived up to 3 months or longer in the same teat canal.
4. Certain bacterial species (Staph. aureus and Str. agalactiae) responsible for TCI cause subclinical mastitis (SCM) and clinical mastitis.

/TCI ...

5. TCI serve as potential sources of bacteria for infection of the udder parenchyma.
6. TCI and latent udder infection are two different entities.
7. TCI may cause udder parenchymal damage.
8. SCM and TCI can occur simultaneously in the same quarter.
9. Many cases of SCM and aseptic mastitis, classified according to the IDF criteria, are actually TCI.
10. TCI may persist despite regular teat dipping.
11. Teat dipping does not necessarily prevent new TCI.
12. The existence of relevant and irrelevant TCI are questioned.
13. TCI are more prevalent in herds kept on zero grazing in comparison to those on pasture.
14. TCI occur in both lactating and non-lactating cows. Some TCI are spontaneously eliminated during the dry period.
15. Antibiotic teat canal therapy administered to lactating cows and to cows during the drying-off period effectively prevents or eliminates TCI.



THE PREVALENCE OF ANTIBODIES TO LEGIONELLA PNEUMOPHILLA  
IN THE EQUINE POPULATION OF SOUTH AFRICA

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In the seven years since the etiology of Legionnaires disease was elucidated an impressive body of information has been gathered on the organism and its disease associations. A review of the literature over this period reveals that a considerable body of knowledge has been gained on the etiology, pathogenesis and epidemiology of the infection. A limited amount of research has been done on six other species of Legionella, all of which have been associated with pneumonia in human beings.

The disease is known to occur worldwide. The incidence of the disease in the Northern hemisphere has been shown to be far higher in the Southern hemisphere. Reports of the disease from the tropical areas of the world are relatively rare. The details of sixteen cases in South Africa have been published.

The guinea pig was developed as the animal model for the study of L. pneumophilla and a detailed study was made of the kinetics of the early inflammatory events during experimental pneumonia in guinea pigs due to L. pneumophilla.

The direct and indirect fluorescing antibody technique has been developed as the standard diagnostic technique, both for serological survey work and for the immediate and rapid diagnosis of the disease. This technique was adapted to the use on horse sera in this serological survey and we were able to obtain positive reference sera from the Centre for Disease Control, Atlanta, Georgia, USA.

Collins et al in an extensive survey of animal sera in the USA found that the occurrence of positive equine sera was 31,4% which was significantly higher than the occurrence of positive sera in cattle 5,1%, swine 2,9%, sheep 1,9%, dogs 1,9%, goats 0,5% and wildlife 0%. In the same series the occurrence of human positive sera was 0,4%. The high percentage of sero positive horses suggested that horses are commonly infected with

L. pneumophilla or related organisms and not unexpectedly the older animals showed a far higher incidence of positive reactions. In South Africa only sixteen horses out of a total of 329 tested showed a positive reaction at a titre of 1:16, giving a percentage of positive animals as 6,4%, however, 42% of the animals showed a reaction to the IFA test at titres below 1:16. There was no particular geographical pattern in the distribution of the positive animals. It was however, noted that the military horses in South West Africa showed a higher incidence of positive reactions than the rest of the animals.

The clinical significance of the findings of serologically positive horses to L. pneumophilla cannot at this stage be established and a definitive demonstration of equine infection will depend on the isolation of the agent and the repetition of a serological study with antigens obtained from organisms isolated from horses.

RABIES IN SOUTH AFRICA : EPIDEMIOLOGICAL TRENDS FOR THE PERIOD  
1980 - 1984

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Rabies is a notifiable disease in the Republic of South Africa in accordance with the Health Act (Act No. 63 of 1977) and the Animal Diseases and Parasites Act (Act No. 13 of 1956). Human rabies cases are recorded by the Department of Health and Welfare. The Department of Agriculture, Division of Veterinary Services, maintains the records of rabies in animals. The complex nature of rabies in wildlife populations and the dynamic socio-political situation in Southern Africa appears to have contributed to various changes in the epidemiological pattern of rabies in the region. The significance of such changes relative to a rabies prevention/control programme can only be determined by a continual evaluation of all data reported.

Epidemiological analyses were carried out on all rabies cases reported for the period 1980 - 1984. Comparisons were made between rabies in humans, domestic animals and wild animals. Mortality rates were used as the standard method of measuring the relevant data. Monthly and yearly trends on a national, regional and seasonal basis were determined. Prevalence rates within various animal species were calculated. Correlations were made between the various parameters measured.

A significant increase in rabies in domestic animals since 1982 was noted. A relationship was found between the increase in rabies in domestic animals and the increase in human deaths due to rabies. The highest number of human rabies cases for 43 years were recorded in 1984. Of all the cases of animal rabies reported canines and bovines accounted for 30% and 19% of the cases respectively. It was shown that rabies in domestic animals was most prevalent in the homelands. During this period KwaZulu showed a dramatic increase in rabies in humans and domestic animals. The greatest number of rabies cases in animals occurred in the winter months. There is an initial increase in wild animals cases, which reaches a peak in May. This is followed by an

/increase ...

increase in the number of rabies cases in domestic animals, with a peak in August. This corresponds with the increase in the number of human contacts with rabid animals that occurred during these months.

WURMS IN WINTERREËNVALSTREEK:  
SKAPE VREK IN SOMER AAN WURMS ONDER  
DIE INVLOED VAN GOEIE REËNS

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In die wintereënstreek (Elsenburgse Proefplaas) is daar oor 2 jaar 'n opname van parasiete in 99 S A Vleismerinos wat op kikuyuweidings loop uitgevoer. Trichostrongylus colubriformis, Trichostrongylus axei en Ostertagia spp. was die dominante wurms.

Na goeie lente- (101,7 mm) en somerreëns (106,6 mm) het skape in die somer van 1983 gevrek met gemiddeld 56 666 T. colubriformis, 12 496 T. axei en 10 304 wurms van Ostertagia spp. Die volgende jaar het die wurmladings geweldig gesak na gemiddeld 151, 1 795 en 1 721 van T. colubriformis, T. axei en Ostertagia spp. onderskeidelik, omdat daar slegs 37,0 en 41,6 mm reën in die lente (1983) en somer (1984) geval het.

Dit is die eerste rapport van sterftes aan parasiete wat gewoonlik in die herfs en winter oorheersend is.

Dictyocaulus filaria, Haemonchus contortus, Nematodirus spathiger, Oesophagostomum venulosum, Trichuris skrjabini was in matige getalle teenwoordig. Min skape was met Chabertia ovina (15), Avitellina spp. (10), Moniezia expansa (6), larwes van Taenia hydatigena (2), Paramphistomum spp. (6) en larwes van Oestrus ovis (43) besmet. Verspreide rooi of grys knoppe (2 - 6 mm in deursnit) in die lang weefstel tewyte aan Muellerius capillaris was in elke skaap teenwoordig.

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