



UNIVERSITEIT VAN PRETORIA
Fakulteit Veeartsenykunde
Faculty of Veterinary Science

PROGRAM EN OPSOMMINGS
PROGRAMME AND SUMMARIES

4de Fakulteitsdag
4th Faculty day
25 September 1987



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VETERINARY MEDICINE.

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

AMPTELIKE INGEBRUIKNEMING VAN DIE SIR ARNOLD THEILERGEBOU
EN VIERDE FAKULTEITSDAG

OFFICIAL OPENING OF THE SIR ARNOLD THEILER BUILDING AND
FOURTH FACULTY DAY

25 September 1987

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

Reëlingskomitee/Organising Committee

Proff R I Coubrough, R O Gilbert, B L Penzhorn, M M S Smuts,
G V Turner, I B J van Rensburg, Dr G L Louw, Mej/Miss J E Arthey

PROGRAM / PROGRAMME

08h30 Verwelkoming Prof R I Coubrough

SESSION I SMALL ANIMALS / KLEINDIERE
CHAIRMAN : Prof H J Bertschinger

- 08h35 1. The pathology and biochemistry of a phospholipid lysosomal storage disease in Abyssinian cats.
A L Lange
- 08h50 2. Evaluation of the use of urine protein electrophoresis in the early diagnosis of renal disease in dogs.
U Tubbesing, C Marshall and J W Nesbit
- 09h05 3. A retrospective study of 50 cases of canine pyometra-metritis complex treated with prostaglandin $F_{2\alpha}$.
R O Gilbert
- 09h20 4. The development of a crowning technique for the canine teeth of working dogs - preliminary results.
G M Covarr, N de Veredicis, F J M Verstraete and M N van Zyl
- 09h35 5. Houvermoë en voorkoms van sekere ligamentprostese= materiale in die konyn.
A M Lubbe en F J M Verstraete
- 09h50 6. Radio-isotoop osteogramme vir die evaluering van beengenesing.
G L Coetzee

10h05 TOEKENNING : DOSENT VAN DIE JAAR

10h15 TEA / TEE

11h00 AMPTELIKE INGEBRUIKNEMING VAN DIE SIR ARNOLD THEILERGEBOU.

OFFICIAL OPENING OF THE SIR ARNOLD THEILER BUILDING.

Wild / Wildlife

1. An Arthromitus-like organism associated with zebra cyathostomes.
R C Krecek, R M Sayre, H J Els,
J P van Niekerk and F S Malan
2. Helminths of the helmeted guineafowl, Numida meleagris.
A Verster and Y Ptasinska-Kloryga
3. Comparisons of reproductive parameters of two Cape mountain zebra Equus zebra zebra populations.
B L Penzhorn

Equines / Perde

4. Distribution of hemotypes in South African Thoroughbreds.
D R Osterhoff and H Nürnbergger
5. The practical application of blood groups in horses.
D R Osterhoff, J C Groenewald and
H Nürnbergger
6. Karyotyping in the family Equidae.
M E Geldenhuys
7. Uterus bicollis in a Clydesdale mare.
D H Volkmann and R O Gilbert
8. Prostaglandin E₂ as a cervical dilating agent in the mare.
H J Bertschinger and D H Volkmann

Herkouers / Ruminants

9. The morphology and fertility of bull sperm with a mid-piece defect.
H J Bertschinger, J T Soley, W J Ehret and
R Wood
10. Morphological features of Sertoli cells from an infertile bull.
J T Soley and R I Coubrough
11. The use of the cumulative sum graph (Cu-sum) to analyse heat detection on the dairy farm.
D C Lourens

12. Die invloed van trichomoniasis en vibriose op die reproduksiedoeltreffendheid van 'n Afrikanerbeeskudde.

J H Malan, J F W Grosskopf, J J van Rensburg en P Minnaar

Demonstration / Demonstrasie

The use of a microcomputer in a veterinary immunology course.

E S Miller and M E Vermaak

SESSIE II

PERDE / EQUINES

VOORSITTER : Prof S S van den Berg

- 13h45 7. Correlation between hispathology and electrocardiography (ECG) in horses suffering from chronic salinomycin poisoning.
S R van Amstel, J W Nesbit, S S Bastianello, A J Guthrie and V M Killeen
- 14h00 8. The effect of dietary biotin supplementation on equine hoof horn growth rate, hardness and appearance.
E A Buffa, S S van den Berg and F J M Verstraete
- 14h15 9. The incidence of bacteria in the involuting uterus of mares.
D H Volkmann, H J Bertschinger, M A Witcomb and D van Zyl

SESSION III

EXOTICS

CHAIRMAN : Prof D R Osterhoff

- 14h30 10. Die oorsprong van die vesels in die kraniale kardiese senuwee van die volstruis.
A J Bezuidenhout
- 14h45 11. Ticks on dogs and caracals in the Eastern Cape Province.
I G Horak
- 15h00 12. Profiel van veeartskliënte.
J S J Odendaal en A Weyers

15h15

TEE / TEA

SESSIE IV

HERKOUERS / RUMINANTS

VOORSITTER : Prof J F W Grosskopf

- 15h30 13. The effect of breed, ambient temperature and treadmill slope on the relationship between heart rate and energy expenditure in cattle walking on treadmills.
J C Sneddon
- 15h45 14. Responses of lactating ewes to exogenous growth hormone.
J G van der Walt, G H McDowell, D Leenanuruksa, P Nimsup, J M Gooden and R Smithard
- 16h00 15. Ecological studies on Ostertagia ostertagi third stage larvae.
R C Krecek and K D Murrell
- 16h15 16. Oestrus synchronisation in dairy heifers using a progesterone releasing intravaginal device (PRID).
D C Lourens
- 16h30 CONCLUSION / AFSLUITING :
Prof P Bland-van den Berg

THE PATHOLOGY AND BIOCHEMISTRY OF A PHOSPHOLIPID
LYSOSOMAL STORAGE DISEASE IN ABYSSINIAN CATS

A. LUCIA LANGE

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University of Pretoria

A hereditary lysosomal storage disease, not previously recognized in man or any animal species, has been identified in Abyssinian cats. A total of 16 affected kittens, 10 pure-bred and 6 cross-bred animals, were examined. Affected kittens, which became ill at about 8 weeks of age, exhibited fine head tremors and a slow progressive ataxia with infrequent mild seizure attacks. Complete autopsies were performed on 15 of the 16 kittens. The most obvious macroscopic changes were hyperplasia of the lymphoid tissue in the lymph nodes and spleen, and diffuse degeneration of the liver. Microscopically, the characteristic features were prominently vacuolated neurons and the presence of spheroids in the white matter of the cerebrum and cerebellum, and vacuolated macrophages in the lymphoid tissue. The lungs had increased numbers of pneumocyte Type II cells and the liver showed extensive hydropic degeneration. The salient ultrastructural feature in the neurons and macrophages was the presence of many membranous cytoplasmic bodies associated with empty spaces. Some of these bodies had regularly arranged lamellae while others contained homogeneous lipid.

Biochemical analysis was performed on serum, various organs and cell cultures from affected kittens and on serum from related unaffected cats and kittens.

The stored substance was identified as a lecithin-like phospholipid by a combination of the biochemical characteristics, the ultrastructural features and the reaction of the substance in various histochemical procedures.

It is possible to partially screen carrier or affected cats by conducting biochemical analyses on serum and on spleen cell cultures, but the most reliable diagnostic feature is the typical ultrastructural appearance of the disease. The possible importance of this condition in Abyssinian cats is that the animals may be used as an animal model should a similar storage disease be found in man.

EVALUATION OF THE USE OF URINE PROTEIN ELECTROPHORESIS IN
THE EARLY DIAGNOSIS OF RENAL DISEASE IN DOGS

U TUBBESING*, C MARSHALL* and J W NESBIT**

Departments of Medicine* and Pathology**, Faculty of
Veterinary Science, University of Pretoria

Failure to obtain early diagnosis of renal disease in dogs is a constant problem due to the lack of availability of simple and practical diagnostic tests in the identification of these cases. Tests such as blood urea and serum creatinine show abnormal levels only when renal disease is already advanced, while renal biopsy is more sensitive but is invasive in that it requires surgical intervention.

In this pilot trial 20 dogs were randomly selected from animals with suspected renal disease admitted to the small animal hospital at the Department of Medicine, Onderstepoort and another 20 were clinically normal animals awaiting euthanasia at the SPCA in Booyens, Johannesburg.

A full clinical examination, faecal flotation, urinalysis and complete blood count were performed on each animal. Serum and urine samples were collected for urea, creatinine sodium, phosphate, osmolality and total protein determinations as well as agarose gel electrophoresis. An exogenous creatinine clearance test was performed to evaluate glomerular filtration rate. Renal biopsy was performed for histopathology.

Urine protein:creatinine, γ globulin:albumin, serum:urine ratios of the different electrophoretic fractions and the sieving co-efficient were calculated.

The clinicopathologic data was correlated with the histopathology results in order to evaluate the usefulness of urine protein electrophoresis in the early recognition of renal disease and in the characterisation of the lesion present. It was found that certain correlations were present between the urine protein pattern and the type of lesion present.

A RETROSPECTIVE STUDY OF 50 CASES OF CANINE
PYOMETRA-METRITIS COMPLEX TREATED WITH PROSTAGLANDIN F_{2α}

R O GILBERT

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

Canine pyometra-metritis complex is a hormonally-mediated disease occurring typically during the long luteal phase of the bitch, and preceded in most instances by the development of endometrial hyperplasia. Early work demonstrated that surgical removal of the corpora lutea from the ovaries was in many instances curative. The ability of prostaglandin F_{2α} and its analogues to cause luteolysis in the bitch prompted investigation of these compounds in the treatment of canine pyometra-metritis complex.

Fifty consecutive cases of canine pyometra-metritis complex where the owner for any reason declined surgery were treated with prostaglandin F_{2α}-THAM at a dose of 30-250 ug/kg twice daily for four days by subcutaneous injection. Antibiotics were included in the treatment regimen. Where necessary intravenous fluid therapy and other supportive treatment was provided. One to five years after discharge those owners who could be contacted were telephoned to obtain follow-up information.

Of the 50 bitches treated, clinical recovery was recorded in 47. Of the other three, one died and two were treated surgically after failure of response to medical treatment. Recurrence of pyometra-metritis complex was reported after discharge in three patients.

Follow up information was available on 31 cases. Of these, no reproductive information was available on 5 bitches. No signs of oestrus had been detected in 5 other bitches. Of 21 bitches in which oestrus had been detected, 17 had been mated. Of these, at least 15 had become pregnant, with 11 weaning at least one litter. Detected abortion occurred in two bitches, and in two others the entire litter died of neonatal septicaemia.

In general, surgery remains the preferred treatment for cases of canine pyometra-metritis complex in bitches not intended for breeding. This is because of the tendency for the disease to recur, and for the other advantages of oophorohysterectomy in non-breeding bitches, especially reduction of the incidence of mammary neoplasia.

In breeding bitches, however, prostaglandin F_{2α} therapy may be recommended as a means of attempting to prolong the breeding life of an affected bitch. Such a bitch should preferably be bred at the first ensuing oestrus following treatment, and success should be regarded as temporary in the light of underlying endometrial changes which might be irreversible.

THE DEVELOPMENT OF A CROWNING TECHNIQUE FOR THE CANINE
TEETH OF WORKING DOGS - PRELIMINARY RESULTS

G M COVARR*, N DE VEREDICIS**, F J M VERSTRAETE* and
N M VAN ZYL**

*Dental Clinic, Department of Surgery, Faculty of
Veterinary Science, University of Pretoria

**National Mechanical Engineering Research Institute,
CSIR

Crown fractures occur commonly in working dogs. Routine conservative treatment is usually limited to endodontic treatment, because at present no reliable prosthodontic technique for crown restoration is available. The aim of this research project is to develop a crowning technique exclusively for the canine teeth of the working dog, rather than to rely on a trial and error application of human prosthodontic techniques.

This research project has been divided into six experiments:

- 1 The morphology of the canine tooth of the German Shepherd Dog.
- 2 A study of the material properties of dentine and enamel in the German Shepherd Dog.
- 3 Fracture patterns in the canine tooth of the dog.
- 4 A computer generated stress analysis of a canine tooth from a German Shepherd Dog with a view to crown design.
- 5 In vivo strain determination on the canine teeth of a German Shepherd Dog.
- 6 The clinical application of optimum crown design.

This paper deals with the preliminary work done in experiments one and four. A mandibular canine tooth from an adult male German Shepherd Dog was extracted intact. The tooth was set in perspex.

Sections of the tooth were cut in such a way that the original internal spatial geometry of the tooth was preserved. The numerical geometry of the tooth was then determined in terms of a set of three-dimensional co-ordinates, using a Reflex microscope.

After first developing the required software, the finite element technique was used to perform a stress analysis on the thus digitized tooth. Stresses and consequent displacements were then plotted graphically so as to provide an overall view of the behaviour of the tooth under a simulated bending force of 100N.

Initial results indicate that stresses are distributed within the tooth in such a way that they are greatest on and near the surface of the tooth. This would seem to indicate that conventional crown design, relying on a single intrapupal post, is unwarranted.

HOUVERMOË EN VOORKOMS VAN SEKERE LIGAMENTPROSTESEMATERIALE
IN DIE KONYN

A M LUBBE en F J M VERSTRAETE
Departement Chirurgie, Fakulteit Veeartsenykunde,
Universiteit van Pretoria

As deel van 'n omvattende projek aangaande die prostetiese vervanging van die Ligamentum capitis femoris in gevalle van herhalende koksofemorale ontwrigting by die hond, is 'n model gebruik om sekere materiale te evalueer, waarby treksterkte en histologiese en makroskopiese voorkoms as kriteria geneem is.

Outogene fascia, beesfascia, monofilament poliamide (Nylon) en monofilament polidioksaanon (PDS) is onder aseptiese omstandighede in vier groepe van twaalf konyne in drie plekke ingeplant, te wete in die koksofemorale gewrig, die subkutis van die lumbale gebied en die gewrigsholte van die knie. In die koksofemorale gewrig is die materiaal ter vervanging van die Ligamentum capitis femoris, wat verwyder is, gebruik. Die koudale benadering is gevolg en die protese is transartikulêr aangewend. Die proefdiere is na 'n periode van twee maande opgeoffer en by die nadoodse ondersoek is die materiale makroskopies geëvalueer. Die ligamentprotesemateriale wat herwin is uit die helfte van die proefdiere uit elke groep, is aan treksterktetoetse onderwerp en dië uit die ander helfte is histologies ondersoek.

Makroskopies is waargeneem dat by die gebruik van outogene fascia in die koksofemorale gewrig 'n funksionele ligament in die plek van die Ligamentum capitis femoris meestal aanwesig was. Dit was nie die geval by gebruik van die ander drie materiale nie. By histologiese ondersoek kon geen noemenswaardige verskille tussen die weefsel van die drie verskillende plasings aangetoon word nie. Outogene fascia het tekens van genesing en vaskularisasie gewys. By die gevalle waar beesfascia gebruik is, was daar 'n prominente weefselverwerpingsreaksie teenwoordig. Vaskularisasie en fibroplasie van die oorgeplante materiaal was nie teenwoordig nie. Die sintetiese materiale het 'n geringe inflammatoriese reaksie uitgelok en 'n geringe fibroplasie is in die omringende weefsel waargeneem.

Die treksterktetoetse het nie betekenisvolle resultate opgelewer nie. Die gebruik van apparatuur wat onvoldoende aangepas is vir hierdie tipe ondersoek is moontlik die oorsaak hiervan. Die makroskopiese en histologiese voorkoms van die weefsel in en om die vier ligamentprotesemateriale, dui aan dat die beste resultate met die gebruik van outogene fascia verkry is.

RADIO-ISOTOOP OSTEOGRAMME VIR DIE EVALUERING VAN
BEENGENESING

G L COETZEE

Departement Chirurgie, Fakulteit Veeartsenykunde

Met röntgenfoto's is kallusweefsel in die reël eers na 2 tot 3 weke sigbaar, nadat 30 - 50 % van die nuutgevormde osteoïed gemineraliseer is. Slegs die globale beengenesingsproses word op 'n gegewe tydskop kwalitatief op 'n röntgenfoto weerspieël, sonder dat die osteoblastaktiwiteit van die been geëvalueer kan word. Hierteenoor is die radio-isotoop osteogram baie meer gevoelig en sal dit minimale veranderinge in beenaktiwiteit kan opspoor. Hierdie verskil is belangrik, aangesien die vroegste fase van beenvorming nou aangetoon kan word. Die vorm van die grafiek (stylte, hoogte en die draaipunt) stel 'n genesingsprofiel voor sodat eksperimentele fiksasiemetodes gekontroleer kan word.

Die beengenesingspatroon van twee verskillende fiksasietegnieke vir tibiale osteotomieë in Beagle-honde is met mekaar vergelyk: 'n Gemodifiseerde Mennenklamp (6 honde) en 'n half Kirschner-fiksator (3 honde) is in kombinasie met 'n intramedulêre Steinmannpen gebruik. Röntgenfoto's en radio-isotoop osteogramme is elke week vir 'n periode van 10 weke uitgevoer. 5 millicuri Technetium - 99 m metileen difosfaan radio-isotope is intraveneus toegedien, en elke hond is 3 uur later met behulp van 'n wye veld gammakamera geskandeer. Vir elke geval is 'n verhouding van die geopereerde been se radio-aktiwiteit oor die kontrole been se radio-aktiwiteit (N) uitgewerk en op 'n grafiek weergegee. Die verhouding van L/N stel die graad van osteoblastaktiwiteit voor, sodat daar vir elke tibia 'n beengenesingsprofiel grafies opgestel kon word. Die beengenesingspatroon is elke week radiologies met die radio-isotoop osteogramme vergelyk.

In die literatuur word die normale beengenesingspatroon as 'n grafiek wat tussen 2 en 3 weke na-operatief 'n piek bereik en dan geleidelik afplat gedurende die konsolidasiefase van fraktuurgenesing aangetoon. Die bevinding met die gemodifiseerde Mennenklamp was dat 'n tweede piek, laer in intensiteit as die eerste piek, tussen 5 en 7 weke na-operatief ontwikkel het, waarna die grafieke dan geleidelik afgeplat het. Geen abnormaliteit was egter gedurende hierdie tweede piek radiologies sigbaar nie. Die beengenesingsprofiel van die half Kirschner-fiksator het tot 'n groot mate ooreengestem met die verwagte genesingsprofiel, maar twee gevalle het ook 'n tweede piek ontwikkel tussen 6 en 9 weke na-operatief.

CORRELATION BETWEEN HISTOPATHOLOGY AND
ELECTROCARDIOGRAPHY (ECG) IN HORSES SUFFERING FROM
CHRONIC SALINOMYCIN POISONING

S R VAN AMSTEL*, J W NESBIT**, STELLA S BARTIANELLO**,
A J GUTHRIE*** and VALERIE M KILLEEN***

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This study was undertaken in an effort to correlate histopathological findings with electrocardiography (ECG) abnormalities in horses which had suffered chronic salinomycin poisoning.

Seven horses known to have suffered from accidental exposure to Salinomycin 18 months previously, were used. ECG recordings were carried out using a Mingograph 62 (Elema-Schönder) six channel recorder on which leads I, II, III, aVR, aVL and aVF were recorded simultaneously, followed by leads CR.LA, CL.LA, CV.LA, X, Y and Z. The modal QRS complex vector was determined for the Einthoven horizontal, semi-orthogonal horizontal, semi-orthogonal transverse and semi-orthogonal sagittal planes. Following euthanasia, a complete post mortem examination was carried out and histopathological examinations were conducted on multiple sections of the heart, including the conduction system. These sections were stained with HE and Masson's Trichrome.

On ECG examination all 7 horses showed various arrhythmias including sino-atrial, atrio-ventricular and intra-ventricular blocks, ventricular premature contractions, T-wave polarity changes, giant T-waves and Modal QRS vector deviations. On histopathological examination a wide variety of pathological abnormalities was found in all horses, the most important being fibrosis of the sino-atrial node, endocardial fibroelastosis, myocardial degeneration and necrosis and a vasculopathy of the intramural arteries and arterioles.

The presence of arrhythmias did not always correlate with the severity of histopathological changes. It was concluded that lesions in conduction tissues may not necessarily result in ECG abnormalities.

THE EFFECT OF DIETARY BIOTIN SUPPLEMENTATION ON EQUINE
HOOF HORN GROWTH RATE, HARDNESS AND APPEARANCE

E A BUFFA, S S VAN DEN BERG and F J M VERSTRAETE

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University of Pretoria

The effect of dietary biotin supplementation on Equine hoof growth rate, hardness and visual appearance was studied over 10 months. Four groups of 8 horses were employed. They were divided according to their daily dietary dose of biotin. Group A received 15 mg and group B 7.5 mg continuously, group C received 15 mg for alternate months and group D acted as controls, receiving no supplementary biotin. Simultaneous clinical observations were carried out on an additional 10 horses exhibiting poor hoof horn.

Hoof growth was measured by the distal movement of a T- hot brand mark from the coronary hair line. Hoof hardness was determined using a D scale Durometer. A total of 10 readings were taken on each hoof. Hoof appearance was determined subjectively. All the readings were repeated at monthly intervals by the same individual.

Treated groups showed significantly higher hoof growth rates than controls. Groups A and B in particular had higher growth rates than group D. Similarly, treated groups showed significantly harder hooves than controls, with group A exhibiting the greatest increase in hardness. The greatest increase in hoof hardness occurred in the region of the hoof quarters and toe. No significant increase in hardness could be shown for the heels. Of the 10 horses with poor hoof horn treated with biotin, 8 showed improved hoof appearance after 5 months of supplementation.

THE INCIDENCE OF BACTERIA IN THE INVOLUTING UTERUS OF MARES

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and D VAN ZYL*

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Bacteria commonly contaminate the involuting uterus of cows and mares. Cows usually rid themselves of the initial infection, which rarely persists after 5 weeks post partum. In the latter case a synergism between aerobic and anaerobic bacteria favours the establishment of a persistent post partal endometritis. This study was aimed at establishing the incidence of anaerobic infections and their relationship to aerobic infections in the involuting equine uterus.

A total of 16 Nooitgedacht mares were swabbed 5 times during the post partum period (Day 0 = day of foaling) as follows : Day 0-1; Day 2-4; Day 8-10; at foal oestrus and Day 20-24. The swabs were guarded, taken from the uterus or cervix (when cervix was closed) and cultured for aerobic and anaerobic bacteria. Involution was monitored by regular rectal and vaginal examinations and notes were made on the nature of the lochia. Daily teasing was carried out.

Only one anaerobe (Peptostreptococcus sp) was isolated in pure culture in the first 2 swabs taken from a single mare. Only 2 of the 16 mares were found to be consistently free of bacteria on all 5 swabs. Only one mare had isolates in all 5 swabs and the bacteria isolated varied with each swab.

Seven of the 16 mares had a copious uterine discharge with evidence of pus at the time the second swab was taken. However, the lochial quality and bacterial isolates appeared to have very little influence on the rate of uterine involution. Six mares failed to show outward signs of foal oestrus but only one of these did not develop a follicle > 3 cm and subsequent ovulation. All mares were found to be clinically normal by the end of the experiment.

In conclusion it would appear that aerobic bacteria can be isolated at some stage from the uterus of most post partum mares. However, very soon after foaling, and probably during foal oestrus, the mares rid themselves of the infection. The incidence of anaerobic infections is low and the significance of these bacteria remains unclear.

DIE OORSPRONG VAN DIE VESELS IN DIE KRANIALE KARDIESE
SENUWEE VAN DIE VOLSTRUIS

A J BEZUIDENHOUT

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Die kraniale kardiëse senuwee van die voëlhart is 'n tak van die vagus senuwee. Studies in die hoender deur ander outeurs het getoon dat 98 % van die senuvesels in die kraniale kardiëse senuwee gedegenerer het 200 dae na midservikale vagotomie. Degenerasie studies van die senuwee na midservikale vagotomie in die volstruis het egter getoon dat daar na 700 dae nog 'n groot aantal ongeaffekteerde vesels teenwoordig was. Uitgebreide degenerasie van gemeduleerde en ongemeduleerde vesels het in die kraniale kardiëse senuwee van die volstruis voorgekom nadat die verbinding tussen die vagus senuwee en die simpatiese ketting deurgesny is. Die teenwoordigheid van adrenergiese vesels in die kraniale kardiëse senuwee van die volstruis is histochemies bevestig. Die studie het eerstens getoon dat daar 'n baie groot verskil is tussen die hoender en volstruis in die tempo waarteen senuvesels in die kraniale kardiëse senuwee degenerer na midservikale vagotomie, en tweedens dat 'n groot deel van die vesels in die kraniale kardiëse senuwee van die volstruis van simpatiese oorsprong is.

TICKS ON DOGS AND CARACALS IN THE EASTERN CAPE PROVINCE

I G HORAK

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University of Pretoria

The seasonal prevalence of ticks was determined on dogs on smallholdings near Grahamstown during a period of 36 consecutive months. The dogs were infested with 14 tick species, of which Haemaphysalis leachi and Rhipicephalus simus were the most abundant. The largest numbers of adult H. leachi were generally present from May or June to January or February, and those of R. simus from August to April.

Complete collections of ticks were also made from 50 caracals in the Cradock, Graaff-Reinet and Southwell regions. This was done in order to determine whether the caracals carried the same ticks as dogs in the eastern Cape as well as which other ticks of economic importance they harboured. The caracals from Cradock and Graaff-Reinet harboured 13 tick species of which Ixodes rubicundus was the most abundant. The caracals from Southwell were infested with 11 tick species of which Ixodes pilosus was the most abundant. Both groups of caracals were infested with substantial numbers of larvae of the tortoise tick, Amblyomma marmoreum.

PROFIEL VAN VEEARTSKLIËNTE

J S J ODENDAAL* en A WEYERS**

*Departement Soötegnologie, Fakulteit Veeartsenykunde,
Universiteit van Pretoria

**Eenheid vir Professionele Opleiding en Dienslewering
in die Gedragwetenskappe (EPOG), Universiteit van die
Oranje-Vrystaat

Op die oomblik is daar geen inligting in Suid-Afrika beskikbaar oor die kliënt wat die mees waarskynlike besoeker van die geselskapsdierveearts is nie. Inligting oor diere-eienaars is nie altyd dieselfde as die veeartskliënt nie. Die doel van die studie was om demografiese inligting van veeartskliënte te versamel, ten einde 'n profiel van die tipiese kliënt saam te stel. Verder kan die studie op die belangrikheid van die atipiese kliëntgroepe wys en watter rol hulle in praktyk kan speel.

Vraelyste is aan 120 veeartse regoor Suid-Afrika gestuur. Die praktyke is geselekteer op grond daarvan dat hulle oorwegend geselskapsdier-eienaars bedien. Slegs vrywillige kliënte wat die veearts by die kliniek/hospitaal besoek het vir 'n konsultasie, was betrokke by die voltooiing van die vraelyste. Die vraelyste is anoniem voltooi en terugbesorg aan EPOG. Ses-honderd en twaalf voltooide vraelyste is terug ontvang en dien dus as 'n steekproef van konsulterende veeartskliënte in Suid-Afrika. Die antwoorde is deur die Buro vir Rekenaardienste van die UOVS verwerk.

Die tipiese veeartskliënt is 'n werkende, redelik jong getroude, blanke vrou, wat in 'n voorstedelike huis woon en twee geselskapsdiere aanhou.

Die voordele van hierdie studie is om die veearts voor te berei vir 'n verskeidenheid tipes kliënte, sowel as die mees algemene tipe. Dit gee ook inligting oor die vlakke van konsultasies wat die veearts moet kan hanteer, en die agtergrond-inligting van kliënte kan die veearts help om spesifieke sensitiwiteite ten opsigte van sekere kliëntspesifiele, te ontwikkel.

THE EFFECT OF BREED, AMBIENT TEMPERATURE AND TREADMILL
SLOPE ON THE RELATIONSHIP BETWEEN HEART RATE AND ENERGY
EXPENDITURE IN CATTLE WALKING ON TREADMILLS

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Four steers (2 Bos indicus and 2 Bos indicus x Bos taurus) were acclimatized to ambient temperatures of 30°C and 20°C in separate mixed pairs. The animals then worked at the temperature to which they had acclimatized, on 2 treadmills (gradients 0 and 6°) for 2 h (one on each treadmill) whilst carrying a load equivalent to 10 % body weight. Each animal repeated the process 4 times before the temperatures were swapped round and the entire process repeated.

The effect of variation between animals (breed), ambient temperature and rate of energy expenditure (treadmill slope) were tested on the linear regression model $EE^W = ARHR + B$ where RHR is the relative heart rate (working heart rate/basal heart rate) and EE^W is the energy expenditure (w/kg^{0,75}).

Breed of animal had no significant effect on the model. The gradient of the regression line was flatter at the higher ambient temperature ($p < 0,05$) indicating a higher heart rate per unit EE; the dual role of the heart in energy production and heat dissipation could have been responsible for this. The gradient of the regression line was significantly flatter ($p < 0,01$) and the intercept significantly ($p < 0,01$) greater during work on the level treadmill cf. the line obtained from the pooled data. This can be explained by lower energy demand (14 W/kg of 30 W/kg on the 6° slope) and thus greater excitability seen on the level treadmill.

This model can be used to predict energy expenditure from working heart rate in bovines over a wide range of mass (300-800 kg) to an accuracy of ± 12 %. This has important implications for subsistence farmers in developing countries where energy intake is the prime limiting factor to work output by draught bovines. More accurate estimation of energy requirements could lessen this problem considerably.

RESPONSES OF LACTATING EWES TO EXOGENOUS GROWTH HORMONE

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Exogenous bovine growth hormone (0.1 mg/kg liveweight) increased yields of milk and milk constituents and milk-fat content when injected over 5 days to lactating ewes in mid-lactation. These changes were associated with changes in the supply to and utilization of nutrients to leg muscle and mammary tissues. Arterial concentrations of glucose and non-esterified fatty acids (NEFA) increased significantly, of lactate and 3-hydroxybutyrate tended to increase, and triglycerides associated with very low density lipoproteins (VLDL) decreased significantly.

Growth hormone increased mammary uptake of NEFA, decreased mammary uptake of VLDL and tended to reduce the release of lactate from leg muscle. Oxidation of NEFA in the whole-body and mammary tissue was increased by growth hormone while that of glucose appeared to be reduced in mammary tissues.

During injection of growth hormone, blood flow to leg muscle and mammary tissue increased and the calculated ratio of blood flow : milk yield increased. These changes in blood flow, together with changes in arterial concentration and tissue utilizations of key metabolites were sufficient to account for the synthesis of extra milk and milk constituents.

ECOLOGICAL STUDIES ON OSTERTAGIA OSTERTAGI
THIRD STAGE LARVAE

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Studies on the herbage migration of third stage Ostertagia ostertagi larvae (L₃) were undertaken to extend our knowledge of the ecology of this cattle nematode parasite. The influence of such environmental factors as climate, pasture type and soil type was considered on the numbers of larvae available to the grazing animal. These observations were made from spring to autumn during 1986 at the Beltsville Agricultural Research Center, the northeastern regional United States Department of Agriculture laboratory.

Herbage migration was examined diurnally, at six three hourly intervals and correlated with several meteorological factors : rainfall, relative humidity, ambient together with minimum and maximum air temperatures, mat, soil and dung temperatures. Vapour pressure deficit, annual precipitation index and soil moisture were also calculated. The largest numbers of larvae were recovered from herbage at sunrise and sunset. The factors which correlated most closely with larval counts of the lower herbage were mat and dung temperature and for upper herbage, vapour pressure deficit and ambient air temperature.

Third stage O. ostertagi larvae have the ability to migrate to depths of 15 cm in sandy loam. This behaviour may signify a larval adaptation which provides a habitat protecting them from harsh conditions prevailing at the surface.

OESTRUS SYNCHRONISATION IN DAIRY HEIFERS USING A
PROGESTERONE RELEASING INTRAVAGINAL DEVICE (PRID)*

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This paper describes a pilot trial which was carried out to investigate the use of PRID's in controlled breeding in heifers. PRID containing progesterone and oestradiol benzoate was employed for oestrus synchronisation and reproductive management in ten 18 month old, well managed, and well grown out Friesland heifers in a commercial Transvaal highveld dairy farm.

A PRID coil was inserted into the vagina of each animal and removed after 12 days. Oestrus observation was done continuously and on the first observed oestrus the heifers were artificially inseminated once. Oestrus detection continued normally for returns to oestrus. Pregnancy was confirmed by rectal palpation at eight weeks after breeding if no return to oestrus had occurred.

The oestrus response and the conception rate to the first artificial insemination were evaluated. Of the ten heifers, nine (90 %) showed oestrus after removal of the PRID, and seven of these (78 %) were found to be pregnant after a single insemination.

The results support previous observations that oestrus control regimens using progesterone are very effective in small groups of well managed and fed dairy heifers. The conception rate can be very high if the A.I. is done on observed oestrus.

*PRID : Registered trade mark of Abbott Laboratories Ltd.

AN ARTHROMITUS-LIKE ORGANISM ASSOCIATED WITH ZEBRA
CYATHOSTOMES

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Microorganisms that attached to the posterior and anterior extremities of zebra cyathostomes were studied with scanning electron and transmission electron microscopy. The predominant constituent of the microbial community was a filamentous prokaryotic organism which resembles Arthromitus Leidy, 1849. The organism was associated with the vulvar and anal openings of the females of 2 of the 6 cyathostome genera. The other organisms in the community included some with a filamentous-cross wall, a distinct double-cell wall, a blunt-end and spiral in shape. Though these microbes were not observed to invade tissues of the cyathostome hosts, they may partially block the reproductive tract of female nematodes thereby limiting their reproductive capacity. The prokaryotic organisms appeared to be commensals living in the effluent of the nematodes.

HELMINTHS OF THE HELMETED GUINEA-FOWL,
Numida meleagris

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From November 1983 to May 1984, 48 helmeted guinea-fowl, Numida meleagris, from the vicinity of Pretoria were examined for helminths. Total worm burdens were determined and each helminth identified.

The mean worm burden (29) was low but 15 species of helminths (7 cestodes, 7 nematodes, 1 acanthocephalan) parasitized these birds. Four birds did not harbour any helminths and 12 were parasitized by 1 species while the remaining 32 were infested with 2-8 species of worms. The dominant cestode, Ascometra numida, with a mean worm burden of 8, occurred in 23 birds. Of the nematodes, the highest mean worm burden (1,8) was that of Dispharynx nasuta but it occurred in only 5 birds while 11 birds infested with Subulura suctoria had a mean worm burden of <1. The acanthocephalan, Mediorhynchus taeniatum, infested 13 birds with a mean worm burden of 1,7.

The diversity of species of helminths found in these guinea-fowl indicate that surveys of the helminths of these hosts should be based on total collection of the helminths and identification of each worm rather than on an aliquot basis.

COMPARISONS OF REPRODUCTIVE PARAMETERS OF TWO CAPE MOUNTAIN
ZEBRA Equus zebra zebra POPULATIONS

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The ecology of natural equid populations may offer clues to factors modulating reproduction. Cape mountain zebra populations were studied in Mountain Zebra National Park (MZNP) and De Hoop Nature Reserve (DHNR). Monthly distribution of births, age at first foaling, foaling interval and minimum age at last foal were determined. Eleven surplus stallions were available for research in MZNP; histological sections of their testes were examined. MZNP is at a high altitude with harsh, dry winters, while DHNR is on the mild coastal plain, with winter rainfall.

The mean age at first foaling of DHNR mares (53,4 months; range : 46-58 months) was significantly less than that of MZNP mares (66,5 months; range : 38-105 months) (Satterthwaite modification of Student's t-test; $P=0,005$). Two MZNP mares were recorded foaling for the last time at > 21 years old. The mean foaling interval at DHNR (22,3 months; range 12-38 months) was virtually identical to that in MZNP (22,1 months; range 13-69 months) (Student's t-test; $P=0,8$). Foals were born all year round with a peak in summer. In MZNP conception occurred later in the season when the spring was dry. At DHNR, 46 % of conceptions occurred during October-December.

In MZNP no colt <5 years old succeeded in becoming a herd stallion. Spermatogenesis was absent in bachelor herd colts < 4 years old, but was starting in a 4,5-year-old bachelor. A DHNR colt running with mares in the absence of adult stallions sired a foal when 3,5 years old. Domestic horse stallions reach puberty at a younger age. The possible psychological inhibitory effect of running with bachelors or being dominated by a mature stallion has to be elucidated.

There are no obvious differences in the reproductive patterns of the two populations living under different ecological conditions, bar the apparent lower mean age at first foaling in the DHNR population, which may be due to the small sample size. With a low mortality rate and a reproductive lifespan of about 15 years, an average Cape mountain zebra mare could be expected to produce 8-9 foals during her lifetime.

DISTRIBUTION OF HEMOTYPES IN SOUTH AFRICAN THOROUGHBREDS

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Hemotypes are defined as certain combinations of phenotypes at analysed loci which could be regarded as "genetic signatures" of individual horses. Of a total of 626 South African Thoroughbred stallions and 1774 mares, 217 stallions (34,7 %) and 684 mares (38,6 %) could be allocated to the 10 most frequent hemotypes. These were compared with French Thoroughbreds. A preliminary investigation on correlations between hemotypes and racing ability has been initiated, in which the cumulative average earning index (CAEI) per hemotype was calculated.

The 10 most frequent hemotypes in South African Thoroughbred stallions and mares are very similar to their French counterparts, indicating that selection for speed leads to the same hemotypes. The most frequent hemotypes of South African Thoroughbred stallions have been correlated with their stakes in US Dollars and to their cumulative average earning index.

One should never give up the search for genetic markers and their influence on performance.

THE PRACTICAL APPLICATION OF BLOOD GROUPS IN HORSES

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During the forty years since systematic studies of blood groups in animals by means of artificially produced antibodies were initiated, immunogenetics and biochemical genetics have developed rapidly. A number of genetically controlled blood group systems have been discovered and elucidated in horses.

Up to 1987 no less than 32 blood factors have been discovered in horses which are inherited in co-dominant fashion in seven blood group systems. Furthermore, a great number of other genetic markers, mainly proteins and enzymes, were discovered as being present in clearly definable forms:

Albumin, Acid phosphatase, Carbonic Anhydrase, Catalase, NADH-diaphorase, Esterase, Peptidase A, Vitamin D binding protein, Haemoglobin, Postalbumin, 6-phosphogluconate dehydrogenase, Phosphoglucomutase, Phosphohexose isomerase, Protease inhibitor, Transferrin.

These genetic markers appear in more than 60 different types and, with the blood factors of the red cells lay the foundation for the two main practical applications:- parentage tests and tests for maternal-embryo incompatibility. Both tests are performed in our laboratory. During 1981/6 83 of the 103 parentage cases investigated were solved, while 217 incompatibility tests were carried out.

KARYOTYPING IN THE FAMILY EQUIDAE

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This poster elucidates the methods used in analysing the chromosomes of members of the Family Equidae.

There are five major steps in treating fresh blood before the final stage is reached. The first phase is the incubation of fresh blood for 12 hours at 37°C under sterile conditions. The second phase comprises fixing of leukocytes in a methanol/acetic acid mixture, and the preparation of slides. When the slides have dried overnight in an incubator, they are ready for staining.

The third phase is the staining of the slides. There are six major staining techniques to demonstrate the different bands in the chromosomes, namely Giemsa, NOR-, C-, G-, Q- and R-banding. The fourth phase is analysis of the slides under a microscope to select metaphase cells with a good chromosome spread for photography.

The final phase is the actual karyotyping of the chromosomes. The chromosomes on the photos are cut out and arranged in groups.

In Equus caballus the first group (14 chromosomes) contains the longest submetacentric chromosomes, while the second group (12 chromosomes) consists of the shorter submetacentric chromosomes. The third, fourth and fifth groups comprise telocentric chromosomes, which are arranged from the longest to the shortest. The third and fourth groups both contain 14 chromosomes and the fifth group 8 chromosomes only. The two sex chromosomes comprise a very long submetacentric X-chromosome and a short telocentric Y-chromosome. The diploid chromosome number in members of the Family Equidae ranges from 32 in mountain zebras to 64 in the horse.

UTERUS BICOLLIS IN A CLYDESDALE MARE

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Developmental anomalies of the cervix of the mare are extremely rare and only 4 cases have been described in the literature. The only case of a uterus bicorpor bicollis (double cervix and uterine body) was found in a Clydesdale mare and was associated with a dorso-ventral band dividing the anterior vagina into left and right compartments. Another tissue curtain divided the uterine body into left and right compartments. The mare conceived during an oestrus when she ovulated from both ovaries, resulting in twin pregnancies (one embryo in each horn). Both pregnancies were terminated by manual crushing of the conceptuses.

The case reported here concerns a 9 year old Clydesdale mare with a double cervix and the same dorso-ventral curtain partially dividing the vagina into left and right compartments. The uterine body is, however, not divided. It thus constitutes a uterus bicollis only.

This mare gave birth to a normal foal in 1985, conceived again during the same breeding season, but aborted at about 4 months of gestation. At the time of abortion the mare was in extremely poor condition and had recently been moved to a new farm. Although no special tests were done at the time, we believe that this abortion may be ascribed to the poor condition of the mare and the added stress of adaptation to a new environment. She conceived again in 1986, but aborted once more, this time at 7 months of gestation. The fetus was found to be normal, but the placenta clearly showed that this had been a so-called body pregnancy. The latter condition is commonly associated with abortion in mares. Upon examination within hours of the abortion it was found that only the right cervix was dilated. On an earlier occasion the mare was examined during oestrus and also then only the right cervix was found to be dilated. Although the left cervix is definitely patent and communicates with the uterine body, it is unclear at this stage whether it is also functional.

The mare has foaled or aborted three times without any complications that could be attributed to the double cervix. There is also no evidence to ascribe the loss of the last two pregnancies to her anatomical abnormality. Further observations will be made to assess the functional capabilities of the mare's left cervix.

PROSTAGLANDIN E₂ AS A CERVICAL DILATING AGENT IN THE MARE

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The physiological control of cervical dilation is not well understood. It was always thought that dilation is controlled by oestradiol-17 β . However, in our domestic species induction of cervical dilation with oestradiol-17 β for clinical purposes gives variable results. In recent years it was discovered that prostaglandin E₂ (PGE) is secreted by the endometrium and it has been implicated as a cervical dilating agent. A PGE₂ preparation (Prostin E₂ tablets, Upjohn) has been developed for use in humans. The tablets are used successfully for inducing labour on account of their cervical dilating properties. Our aim was to establish the effects of PGE₂ tablets on the cervix of anoestrous dioestrous and oestrous mares as well as pregnant mares close to term (< 14 days).

In our trial we used 5 dioestrous, 1 oestrous, 1 anoestrous and 15 pregnant mares. After a pilot trial we decided to treat as follows: Introduce one 0,5 mg PGE₂ tablet into the caudal half of the cervix; wait 30 min; administer another 3 tablets into cranial part of the cervix. The cervixes of the mares were examined by visual appraisal using a speculum and physically by palpating for patency as follows: Before the first treatment, T₀; before the second treatment T₃₀; 60 min after the first treatment, T₆₀; 90 min after the first treatment, T₉₀ and at regular intervals thereafter up to 6 h after initial treatment.

All the mares responded promptly with a visual and physical dilation of the cervix after the first tablet and this increased after the second treatment. In the non-pregnant mares the degree of dilation progressed from closed at T₀ to 1 finger open caudally at T₃₀, 2 fingers caudally and 1 finger cranially at T₆₀ and 2 fingers caudally and 1 1/2 cranially at T₉₀. Visually the cervix becomes very oedematous and hyperaemic with a doubling or trebling in the size of the folds of the pars vaginalis. In the pregnant mares dilation was far more dramatic with a change from 0-1 finger open to 4-5 fingers open at T₆₀. No toxic side effects, systemic or local, were noticed in any of the 22 treated mares.

It is concluded that PGE₂ tablets are extremely effective in dilating the cervix of the mare. The effect, especially initially, is very local, and means that for induced dilation over the entire length of the cervix PGE₂ tablets must be administered twice at an interval of approximately 30 min.

THE MORPHOLOGY AND FERTILITY OF BULL SPERM WITH A
MID-PIECE DEFECTH J BERTSCHINGER*, J T SOLEY**, W J EHRET and
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Veterinary Science, University of Pretoria

Sometimes, when examining bulls for genital soundness, one encounters sperm abnormalities that have not been described before or classified into either major or minor defects. Such a defect is chipping of the mid-piece. During the past 15 years we have observed this defect in 4 bulls. Recently at the Northern Farm of the Johannesburg City Council we identified the defect in the semen of a Bovelder bull and decided to establish whether or not it would effect fertility and if the defect was temporary or not.

The bull in question was 17 months old when first examined. During the next 8 months semen was collected regularly for evaluation and also dilution and freezing. Sperm were prepared for light microscopy, transmission electron microscopy (TEM) and scanning electron microscopy (SEM). Thawed frozen semen was used to inseminate 28 cows in one section of the farm where there are a total of 202 cows. Semen of 6 other bulls was also employed, each on approximately an equal number of cows. The cows were inseminated during a restricted breeding period of 50 days. Pregnancy diagnosis was carried out by rectal palpation 3 months after the end of the breeding period. Using these results, first insemination conception rate, overall conception rate and number of inseminations per pregnancy were calculated for each bull employed in the section.

The mid-piece abnormality, which is shown in the different figures, persisted throughout the 8-month observation period. The number of sperm showing the defect varied from 27-45 %. The other semen parameters were all within the normal range. First insemination conception rate, overall conception rate and the mean number of inseminations per pregnancy for the bull with the mid-piece defect, the range and mean for all the bulls were respectively: 60,9 %, 82,1 % and 1,5: 53,3 - 75 %, 82,1 - 93,8 % and 1,3 - 1,8 and 59,9 %, 89,1 % and 1,6.

It is concluded that the mid-piece defect demonstrated in the figures should be classified as a minor defect as it had no significant negative effect on the fertility of the semen. The defect persisted throughout the trial period of 8 months indicating that it may persist during the entire life-time of the bull. It is speculated that the defect originates during the epididymal phase of sperm production and perhaps it is brought about by detachment of the cytoplasmic droplet.

MORPHOLOGICAL FEATURES OF SERTOLI CELLS FROM AN
INFERTILE BULL

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Sertoli cells form an integral component of the testicular germinal epithelium and are responsible for a variety of essential functions. This paper presents a comparison between the morphological features of normal bovine Sertoli cells and those of an infertile bull displaying the "stump-tail" defect.

Testicular samples obtained from the bull immediately after slaughtering were immersion fixed in 4 % cacodylate buffered glutaraldehyde, post-fixed in 1 % osmium tetroxide, and routinely processed for transmission electron microscopy.

The Sertoli cells examined during the study displayed morphological features similar to those recorded in the literature. The nucleus, which was situated in the basal part of the cell close to the basal lamina, was irregularly shaped and contained a typical vacuolated nucleolus. The cytoplasm exhibited the variety of organelles and inclusions generally observed (mitochondria, smooth and granular endoplasmic reticulum, dictyosomes, cytoskeletal elements, and membrane-bound dense bodies). The mitochondria located in the supranuclear region of the cells were frequently elongated and aligned along the major cells axis, while those situated in the basal part of the cells were small round or oval structures. Closely associated with the latter were atypical mitochondria which occurred singly or in groups. These structures were extremely large and displayed round, pear or spindle-shaped profiles containing conspicuous concentrations of crystalloid material. In longitudinal sections this material was seen to consist of closely-packed bundles of parallel-oriented filaments. Cross sections of the crystalloids confirmed their closely packed fibrillar nature but revealed no specific pattern or arrangement of the filaments. Some mitochondria were almost completely filled with crystalloids, with only a thin rim of matrix containing rests of cristae being discerned. In other instances the crystalloids were limited to the central interior or apex of the mitochondria, the remainder of the organelle displaying a relatively normal, albeit enlarged, form.

Although the significance of atypical mitochondria in Sertoli cells is unclear, the similarity between the mitochondrial crystalloids and the Charcot-Böttcher crystalloids seen in man may point to an association between crystalline structures and the occurrence of certain sperm defects.

THE USE OF THE CUMULATIVE SUM GRAPH (CU-SUM) TO ANALYSE
HEAT DETECTION ON THE DAIRY FARM

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This poster describes a comparative Cu-sum study on heat detection from three different dairy herds with the DAISY computer program. It illustrates good heat detection (Herd I) poor heat detection (Herd II) and heat detection which fluctuates around 50 %.

Starting at the top of the paper, halfway along the horizontal axis which represents the vertical base line a character is plotted (* for heat, A for AI). This represents the first oestrous interval for the selected period under investigation. Moving down to the next line a second character is filled in representing the second interval. When a heat or service occurs within 16-28 days of a previous heat or service it is considered to be a correctly detected heat and the plot will move one position to the right. Any interval outside this range is considered to be a mistaken heat, then the next plot will go to the left. This procedure is repeated for all the oestrous intervals for the specified period in date order.

By plotting oestrous intervals against time, seasonal, nutritional and managemental changes may be correlated with any change in the index. Factors responsible for poor heat detection can be pinpointed and corrective action taken. The Cu-sum graph shows at a glance what the trend in heat detection has been over the specified period.

In herd I most of the returns occurred normally giving a line going off to the right at a 45° angle to the vertical base indicating good heat detection. In a good herd one would expect 80 % of returns to be within normal limits.

In herd II the returns occurred outside the normal limits giving a line of 45° to the left of the vertical base line indicating very poor heat detection.

If the line fluctuates around the base line like in herd III then the overall heat detection is only ± 50 %.

Problems with heat detection are the basis for a large part of dairy cow infertility. By using computer programs like DAISY it can assist the farmer, his veterinarian and other advisors in the planning and control of dairy herd health and production.

DIE INVLOED VAN TRICHOMONIASE EN VIBRIOSE OP DIE
REPRODUKSIEDOELTREFFENDHEID VAN 'N AFRIKANERBEESKUDDE

J H MALAN, J F W GROSSKOPF, J J VAN RENSBURG en
P MINNAAR

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Die reproduksiedoeltreffendheid van 'n Afrikanerstoetbees=
kudde is bepaal deur jaarlikse ondersoeke. Met die roetine
ondersoeke van die kudde was trichomoniasie en vibriose in
die kudde vasgestel. Die besettingsresultate van die kudde
kon gedurende die aktiewe stadium van besmetting, na
behandeling en verskeie jare nadat geen verdere besmetting
in die kudde vasgestel kon word nie, gevolg word.

Gedurende die dekseisoen was elke bul by 'n sekere aantal
koeie geplaas. Deur verwerking van die resultate van die
onderskeie dekseisoene kon die verskil tussen besmette bulle
en die waarin besmetting nie vasgestel kon word nie,
aangedui word. Die onderlinge vergelyking tussen die
dekseisoene se resultate dui ook die gevolge van twee
geslagsiektes op 'n vleisbeeskudde aan wat onder dieselfde
bestuurs-, weidings- en omgewingsomstandighede aangehou was.

Die kudde se algemene dragtigheidspersentasie met die somer-
en winterdekseisoene, die getal koeie deur elke bul
gedurende die dekseisoen bevrug, die tydperk waarin die
kalwers voor die dekseisoen aangekom het en die algemene
kuddeprestasies word in tabelvorm weergegee.

DEMONSTRATION

THE USE OF A MICROCOMPUTER IN A VETERINARY
IMMUNOLOGY COURSE

E S MILLER* and M E VERMAAK**

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

**Consultant in Computer Managed Instruction

The knowledge explosion and unfavourable student/lecturer ratio has compounded the need for more individualised instruction in the biosciences. This ongoing research project investigates the integration of the microcomputer into the immunology course. Optimal integration with the various aspects of the course entailing an insight frame, the studyguide, the handbook and other sources (e.g. colour slides), the lecturer and student, was studied. The Authoring language, MICROTEXT, was used for writing the computer course material while keeping the project practically within reach of lecturers with no programming knowledge.

This demonstration will include two microcomputers and slide projectors with the immunology courseware running.



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