



UNIVERSITEIT VAN PRETORIA

**FAKULTEIT VEEARTSENYKUNDE
FACULTY OF VETERINARY SCIENCE**

**9th Faculty Day
de Fakulteitsdag**

**October 1, 1992
Oktober 1, 1992**

**PROGRAM EN OPSOMMINGS
PROGRAMME AND SUMMARIES**



SmithKline Beecham

Fakulteit Veeartsenykunde, Universiteit van Pretoria

Faculty of Veterinary Science, University of Pretoria

NINTH FACULTY DAY
NEGENDE FAKULTEITSDAG

1 October/Okttober 1992

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

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Rensburg; Drr W.A. Schultheiss, E.A. Boomker; Mnrr F. Beukes, F.A. Nel**

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MESSAGE FROM THE DEAN

Professor R.I. Coubrough

Apart from the success of an academic programme, the stature of a Faculty is also measured by the output and quality of its research programme. Each year, our Faculty Day provides an excellent opportunity for our personnel to present their current research results. These results reflect anew a growing commitment to the establishment of a definite research culture at our Faculty. Without such a culture, we cannot hope to serve as the seed-bed for young researchers who must rise from the ranks of our undergraduate students. The research ebullience of active role models cannot but stimulate enquiring young minds and hopefully spur them on to join research teams in their particular areas of interest. Without a solid research base, our profession cannot hope to adequately serve the future needs of our growing society. Thus a major responsibility rests on us in this regard. It is a challenge we dare not ignore.

Our departmental spotlight this year falls on the Department of Veterinary Ethology. As one of the basic subjects in our curriculum, this department forms an essential component of our course and is indispensable as a foundation for our clinical training.

Medical illustrations have, since time immemorial, supported the study and elucidated the mysteries of medical sciences. This year, we are fortunate to have an exceptional exhibition of such illustrations as part of our Faculty Day programme. I have no doubt that it will prove to be one of the highlights of the day.

Professor Johnny van der Walt and his team have once more done sterling work in putting together a really excellent scientific and cultural programme. Faculty Day is a day of which we as a Faculty can be justly proud. To those who organise, to those who present the results of their research, to those who come to listen, learn, enjoy and support the day, a sincere word of thanks.

CURRICULUM VITAE

DR C.M. Cameron

BVSc(Pret), DVSc(Pret), MSA(Pret)



Vanjaar se Sir Arnold Theilergedenklesing word deur dr C M Cameron, Adjunk-direkteur-generaal van die Departement van Omgewingsake voorgedra. Na die verwerwing van sy BVSc-graad in 1959 het dr Cameron by die Navorsingsinstituut vir Veeartsenykunde te Onderstepoort aangesluit. In 1974 is hy tot Assistent-direkteur en in 1982 tot Adjunk-direkteur van dié instituut bevorder. Vanaf 1969 tot 1973 het hy as Deeltydse Senior Lektor, Departement Infeksiesiektes, Fakulteit Veeartsenykunde, Universiteit van Pretoria diens gelewer. Hy is die outeur van 64 wetenskaplike publikasies.

In 1985 is dr Cameron as Hoofdirekteur, Forensiese en Navorsingsdienste van die Departement van Nasionale Gesondheid en Bevolkingsontwikkeling aangestel. In 1991 is hy tot sy huidige posisie as Adjunk-direkteur-generaal, Departement van Omgewingsake bevorder en sal vanaf 1 Oktober 1992 as Direkteur- Generaal van die Departement oorneem.

Dr Cameron het sy professie op verskeie gebiede met lof gedien. Vanaf 1980 tot 1982 was hy President van die Suid-Afrikaanse Veterinêre Vereniging. Hy was vanaf 1983 tot 1985 lid van die Suid-Afrikaanse Veterinêre Raad. In 1979 was hy tot President van die Vereniging van Staatsamptenare van Suid-Afrika verkies, 'n amp wat hy tot 1990 bekleë het. Hy is tans lid van die Sentrale Raad van Mediese skemas, Raadslid van die Suid-Afrikaanse Instituut vir Publieke Administrasie en lid van die Suid-Afrikaanse Vereniging vir die bevordering van Christelike Wetenskap.

In 1992 het hy 'n Eretoekening vir Buitengewone Diens van die Vereniging van Staatsamptenare ontvang.

PROGRAM/PROGRAMME

FAKULTEITSDAG 1 OKTOBER/OCTOBER 1992 FACULTY DAY

- 08:15-09:00 **REGISTRASIE EN KOFFIE/REGISTRATION AND COFFEE**
- 08:15-17:00 **SCIENTIFIC ART EXHIBITION/WETENSKAPLIKE KUNSUITSTALLING**
- 09:00-09:15 **VERWELKOMING DEUR DEKAAN/WELCOME BY THE DEAN**
- 09:15-09:45 **SIR ARNOLD THEILER MEMORIAL LECTURE/GEDENKLESING**
 Care of the Environment: Whose Responsibility?
by Dr C.M. Cameron - Deputy Director-General, Department of Administration & Environmental Conservation
- 09:50-10:20 **FOKUS OP: DEPARTEMENT VETERINêRE ETOLOGIE**
FOCUS ON: DEPARTMENT OF VETERINARY ETHOLOGY
- 10:20-10:30 **TOEKENNING AAN "DOSENT VAN DIE JAAR"**
"LECTURER OF THE YEAR" AWARD
- 10:30-11:15 **TEA AND VIEWING POSTERS/TEE EN PLAKKAATBESIGTIGING**
- 11:15-12:45 **RESEARCH PROGRAMME/NAVORSINGSPROGRAM**
- Session I/Sessie I Chairman: Prof G.F. Bath
1. Neuropeptides in the myenteric ganglia and nerve fibres in the fore-stomachs and abomasum of grey, white and black Karakul lambs
H.B. Groenewald
 2. Vanadium air pollution: a possible cause of "illthrift" in dairy cattle
B. Gummow, C.J. Botha, S.S. Bastianello, A.T. Basson, A.J. van der Merwe, H.J.C. Smith, A.H. Looock & J.L. Schoeman
 3. A post-slaughter investigation into the tail biting syndrome in pig carcasses from selected problem herds
H.W. Lee & C.M. Veary
 4. The effect of the reverse even frog pressure shoe on hoof wall compression and third phalanx displacement in the horse
A. Olivier & J. Seggar
 5. Treatment in experimentally induced heartwater in mice
S.R. van Amstel & P.T. Oberem
 6. The effect of climatic factors on the abundance of oribatid mites on an irrigated grass pasture
L.C. van Nieuwenhuizen, A. Verster, I.G. Horak & R.C. Krecek
- 12:45-13:45 **LUNCH (for registered participants/vir geregistreerde deelnemers)**

13:45-14:30 **NAVORSINGSPROGRAM/RESEARCH PROGRAMME**Sessie II/Session II

Voorsitter: Prof P.G. Howell

7. Coccidial infection in German Shepherd Dog pups in a breeding unit
B.L. Penzhorn, K.G.M. de Kramer & L.M. Booth
8. Avocado (*Persea americana*) poisoning in ostriches
W.P. Burger, T.W. Naudé, I.B.J. van Rensburg, C.J. Botha & A.C.E. Pienaar
9. The use of monoclonal antibodies for typing South African Field strains of *Haemophilus paragallinarum* and the identification of NAD independent isolates
R.R. Bragg, L. Coetzee & J.A. Verschoor

14:30-15:00 **SPECIAL INTEREST GROUPS/BELANGSTELLINGSGROEPE**

Voorsitter: Prof B. Penzhorn

1. Babesia - Prof M.G. Collett
2. Wildnavorsing - Prof N.P.J. Kriek

15:00-16:00 **REFRESHMENTS AND VIEWING OF POSTERS****VERVERSINGS EN BESIGTIGING VAN PLAKKATE**

Voorsitter: Prof A.J. Bezuidenhout

16:00-16:45 **RESEARCH PROGRAMME/NAVORSINGSPROGRAM**Session III/Sessie III

Chairman: Prof H.J. Bertschinger

10. A comparison of oils in the lipid assimilation test in dogs
W.L. Berry & F. Reyers
11. Improved fertility of frozen-thawed canine semen inseminated intravaginally after the addition of autologous prostatic fluid
J.O. Nöthling & D.H. Volkmann
12. Is the azotaemia in canine babesiosis an indication of renal disease?
F. Reyers

16:45-16:55 **DEAN'S AWARD FOR BEST PAPER AND POSTER****DEKAANSTOEKENNING VIR BESTE REFERAAAT EN PLAKKAAT**16:55-17:00 **AFSLUITING/CONCLUSION**

Prof J.G. van der Walt.

17:00-20:00 **COCKTAIL PARTY/SKEMERPARTYTJIE**

RESEARCH PROGRAMME/NAVORSINGSPROGRAM

Short Communications/Kort Mededelings

NEUROPEPTIDES IN THE MYENTERIC GANGLIA AND NERVE FIBRES IN THE FORE-STOMACHS AND ABOMASUM OF GREY, WHITE AND BLACK KARAKUL LAMBS

H.B. Groenewald

Department of Anatomy

Homozygous grey and white Karakul lambs suffer from a lethal genetic condition which causes death after weaning. Previous studies have shown that grey and white lambs have larger rumens than black lambs. The rumens of the affected lambs are filled with milk. Histologically the tunica muscularis of the grey and white lambs is thin when compared to the black lambs and there is a significant decrease in the number and size of the myenteric ganglia and neurones in the grey and white lambs.

The aim of this study was to determine whether myenteric neurones are functional in grey and white Karakul lambs by comparing the presence of neurotransmitters (Vaso intestinal peptide (VIP), Somatostatin (SOM), Neurotensin (NT), Neuropeptide Y (NPY), Met-enkephalin (ENK), Calcitonin gene related peptide (CGRP) and Substance P (SP)) in the myenteric ganglia and nerve fibres of the fore-stomachs and abomasum with that in black normal lambs.

Four specimens, 1 cm², were taken from analogous areas of the wall of the rumen, reticulum, omasum and abomasum of newborn grey (n = 5), white (n = 5) and black (n = 5) Karakul lambs. They were pinned to wax squares, fixed for 18 hours in Zamboni's fixative, dehydrated and rehydrated through graded alcohols and stored in phosphate-buffered saline. The outer longitudinal muscle layer of each sample of the rumen, reticulum, omasum and abomasum was separated from the rest of the tissue layers, stained for each of the 7 neuropeptides employing the immunofluorescence technique and studied with a Leitz Orthoplan fluorescent microscope.

All the material studied was positive for each of the 7 peptides tested for. The total immunoreactivity was weaker in the grey and white lambs when compared to the black lambs due to the paucity of myenteric ganglia and neurones in the affected lambs. It is concluded that the myenteric neurones in the grey and white lambs, although fewer in number, are functional.

VANADIUM AIR POLLUTION: A POSSIBLE CAUSE OF "ILLTHRIFT" IN DAIRY CATTLE

B. Gummow, C.J. Botha¹, S.S. Bastianello², A.T. Basson², A.J. van der Merwe³, H.J.C. Smith³, A..H. Looock³ & J.L. Schoeman³

Department of Infectious Diseases, ¹Department of Pharmacology and Toxicology, ²Onderstepoort Veterinary Institute, ³Institute of Soil, Climate and Water

An epidemiological investigation into an "illthrift" problem occurring on a dairy farm situated adjacent to an alloy processing unit established that the cause of the problem was most likely chronic vanadium toxicity. The disease manifested initially in animals 4 to 18 months old which showed cachexia, chronic diarrhoea and in some cases, rhinitis, conjunctivitis and recumbency followed by death. Post-mortem (12 animals) and clinical pathology findings (60 animals) showed that malabsorption and immunosuppression were the basis of the pathogenesis in affected animals. Eight months into the investigation adult cows began showing evidence of cachexia, a drop in milk production and an apparent increased number of stillbirths.

Over a 2-year period surface soil samples (n = 134), sub soil samples (n = 134) and grass samples (n = 134) were collected on the farm and analyzed for various fractions of vanadium. Thirty-four of each of these samples were collected at different time intervals (summer 1990, winter 1990 and summer 1991) and at varying distances and directions from the processing unit in order to gauge the magnitude of the problem, the distribution pattern of vanadium and to identify any seasonal trends. The remaining 100 of each of these samples were taken at 100 m intervals over an area of *ca.* 13 ha directly adjacent to the processing plant so that concentration isolines for vanadium could be drawn and the source identified more conclusively.

The levels of vanadium were found to be highest closest to the mine and surface soil levels were consistently higher than sub soil levels suggesting aerial pollution. In addition washed grass samples were considerably lower in vanadium than unwashed grass samples, indicating that much of the abnormally high levels of grass vanadium were in dust on the plants. Highest levels of vanadium were found in the soil during summer and on the grass during the winter. These analyses therefore confirmed the presence of high vanadium levels (≤ 1122 ppm) in the surface soils and grass (≤ 558 ppm) on the farm and showed that the major source of water-soluble vanadium was the adjacent alloy processing unit.

Hence by means of a thorough epidemiological investigation the source, cause, symptomatology and pathology of a disease that has never previously been published in Southern Africa was established.

A POST SLAUGHTER INVESTIGATION INTO THE TAIL BITING SYNDROME IN PIG CARCASSES FROM SELECTED PROBLEM HERDS

H.W. Lee & C.M. Veary

Department of Veterinary Public Health

Tail biting in pigs is an abnormal behavioural pattern that may cause blood loss, superficial pathology developing later into tail necrosis and frequently local abscess formation, especially in the spinal cord, which can result in paralysis. Haemorrhagic infarction occurs particularly in the lungs following pyaemia and embolic pneumonia.

The 1990 daily slaughter records of an abattoir in the Pretoria area were analyzed to select producers who slaughtered pigs regularly at the abattoir and who had a relatively high incidence of total carcass condemnation for pyaemia. The abattoir was selected because of a simple computerised marketing and recording system.

Ten thousand one hundred and eleven freshly slaughtered carcasses from these pig herds were examined for the degree of tail necrosis, classified as either mild (only tail end bitten), moderate (tail at least half bitten) or severe (tail bitten to the rump), and related to the sex, market mass and any other simultaneous lesion involvement in the body. The mass involved with total carcass condemnation or partial condemnation due to cut-away was recorded and the economic loss determined retrospectively.

The total incidence of the tail biting syndrome in these herds was 2.03%, and it was different between different categories of sexes and market mass. Eighteen pyaemia cases were examined out from the surveyed herds, and seventeen of them had the tail biting syndrome, representing 50% of the endogenic causes of total carcass condemnations. The total income of the producers was reduced by 0.18% due mostly to total carcass condemnation.

This syndrome was found to be the most important reason for total carcass condemnation in the herds surveyed. For a reduction to the economic loss to the pork industry, further research to find an effective control programme is necessary.

THE EFFECT OF THE REVERSE EVEN FROG PRESSURE SHOE ON HOOF WALL COMPRESSION AND THIRD PHALANX DISPLACEMENT IN THE HORSE

Ann Olivier & J. Seggar¹

Department of Surgery; ¹Farrier, Johannesburg

The reverse even frog pressure (REFP) shoe is a horseshoe designed to combine the advantages of a reverse shoe and an adjustable heart bar shoe in the treatment of horses with chronic laminitis. The shoe is fitted in reverse to the horse's foot. It is designed to apply frog pressure uniformly over a large area of the solar surface of the frog, as opposed to a small area of frog pressure applied in the adjustable heart bar shoe. Frog pressure can be increased or decreased as desired.

Five clinically normal horses were humanely killed and their dismembered forelimbs used in an in vitro study to determine the effect increasing frog pressures have on hoof wall weight-bearing and third phalanx (P3) movement within the hoof, as downward vertical force is applied to the limb.

Strain gauges were applied to the toe, quarter and heel of the medial hoof wall of each limb to measure compression of the hoof wall. Strain gauges were applied to the ground surface of the carrying tab portion of the shoe to measure frog pressure. A linear variable distance transducer (LVDT) was inserted into a hole in the dorsal hoof wall. The LVDT measured P3 movement in a dorsopalmar plane relative to the dorsal hoof wall. The entire limb was mounted vertically in a tensile testing machine and submitted to vertical downward force of 0 to 2500 N at a speed of 5 cm/minute.

The test was conducted five times on each limb, under five circumstances: no frog pressure; frog pressure at 7 N/cm (the setting when the shoe is used clinically); frog pressure causing pain to the horse (determined before euthanasia); frog pressure alleviating this pain; after shoe removal.

It was found that increased frog pressure decreased total weight-bearing on the hoof wall ($p < 0,005$), but not at the clinically effective frog pressure. Increased frog pressure decreased palmar movement of P3 at loads up to 1400 N applied ($p < 0,05$), but not at higher loads. At the clinically effective frog pressure there was no significant difference in third phalanx movement.

It can be concluded that the REFP shoe decreases P3 movement at low weight-bearing loads and decreases total hoof wall weight-bearing as frog pressure is increased. Further studies using the REFP shoe need to be conducted on chronic laminitis horses as well as comparative studies with other shoes used in the treatment of chronic laminitis.

TREATMENT IN EXPERIMENTALLY-INDUCED HEARTWATER IN MICE

S.R. van Amstel & P.T. Oberem¹

Department of Medicine, ¹Onderstepoort Veterinary Institute

The aim of this study was to test the efficacy of various drugs in the supportive treatment of experimentally-induced heartwater in mice in the absence of any specific treatment. Survival versus mortality in the experimental groups was taken as the basis for measuring the efficacy of a drug.

Nine groups of 30 mice each were experimentally infected with a titrated amount (0,4 ml) of the KUMM Snyders strain of *Cowdria ruminantium* via the intraperitoneal route. The mice were kept under standard experimental conditions and the number of mortalities was recorded on a daily basis from infection until day 19 when the experiment was terminated. No more mice died after that day. The mice were treated from day 9 post infection (Table 1). The first mortalities were recorded on day 12 (Table 2). Confirmation of heartwater was based on macroscopic post mortem findings (the presence of ascites, splenomegaly and the absence of unusual signs of disease eg. pneumonia).

There was 100% mortality rate in the control group (Table 2). The highest survival rate was in the betamethasone group (67%) followed by the DMSO group (53%). Betamethasone blocks the arachidonic cascade and DMSO has been shown to be effective as an oxygen radical scavenger. Both these mechanisms could play a role in the pathogenesis of heartwater. More work needs to be done in terms of the timing of treatment, the drug dosage and administration intervals using the above model.

Table 1. Drugs, dosages and intervals used in treating experimentally-induced heartwater in mice

<i>Drugs/Substances used</i>	<i>Dosage</i>	<i>Interval and route</i>
Water (control)	0,1 ml	Intraperitoneal (IP) once a day
Flunixin	0,05 mg	IP once a day
Aspirin	0,75 mg	Per os 4x a day
Ibuprofen	1,6 mg	Per os twice a day
Indomethacin	0,025 mg	Per os once a day
Phenylbutasone/Isopyrin	0,5 mg/0,9 mg	IP once a day
Dimethylsulfoxide (DMSO 94%)	0,125 mg	IP twice a day
Prednisolone	0,25 mg	IP every 2nd day
Betamethasone	0,0025 mg	IP twice a day

Table 2. Mortality rate of mice with experimentally-induced heartwater

<i>Day post infection</i>		12	13	14	15	16	17	18	19	
		<i>Total number dead</i>								<i>% mortality</i>
<i>Experimental groups</i>	Control	1	20	24	27	27	28	30	-	100
	Aspirin	5	21	25	26	26	28	28	28	93
	Flunixin	0	11	19	22	22	25	25	26	87
	Ibuprofen	4	12	15	21	21	25	26	26	87
	Indomethacin	0	7	11	16	16	16	17	19	63
	Phenylbutasone	0	13	14	19	19	21	21	22	73
	DMSO	0	0	6	6	6	9	12	14	47
	Prednisolone	0	8	17	25	25	26	27	28	93
	Betamethasone	0	3	6	9	9	9	10	10	33

THE EFFECT OF CLIMATIC FACTORS ON THE ABUNDANCE OF ORIBATID MITES ON AN IRRIGATED GRASS PASTURE.

L.C. van Nieuwenhuizen, A. Verster, I.G. Horak & R.C. Krecek

Department of Parasitology

Oribatid mites are the intermediate hosts of anoplocephaline cestodes which are parasites of reptiles, birds and mammals, including ruminants and man. The mites inhabit the herbage and upper layers of the soil and take in cestode eggs while feeding on algae, fungi and faecal particles. The eggs hatch and the oncospheres pass into the body cavity of the mite and develop into cysticercoids. Ruminants such as sheep etc. ingest the mites accidentally while feeding; the cysticercoid is liberated, the scolex attaches itself to the wall of the small intestine and grows a strobila. The prevalence of cestodes e.g. *Moniezia* spp., is therefore dependent on the abundance of oribatid mites which in turn is influenced by climatic factors. The seasonal abundance of oribatid mites was studied on an irrigated pasture at the Onderstepoort Veterinary Institute. Twice a month soil samples were randomly collected two hours after sunrise, at midday and two hours before sunset and the mites recovered. Climatic data from a microweather station were recorded automatically and the number of mites recovered correlated with climatic factors.

The total number of mites on the herbage showed a peak in January and correlated very well with the temperature in the mat in the morning as well as 30 days prior to collections and correlated with rainfall in the morning and afternoon as well as 30 days prior to collection. On the herbage and in the top 5cm of soil the total number of mites showed a peak in April and May and correlated negatively with soil temperature in the morning, afternoon and 30 days prior to collection. The numbers also correlated positively with radiation in the morning, at midday, on the day of collection as well as 7, 14 and 30 days prior to collection. On the herbage, the total number of mites was significantly higher two hours after sunrise than at midday and two hours before sunset. There were no significant differences in the total number of mites on the herbage and in the top 5cm of soil at different times of day.

It is therefore clear that environmental factors such as temperature, rainfall and radiation influence the abundance of these mites at different times of the day as well as different times of the year.

COCCIDIAL INFECTION IN GERMAN SHEPHERD DOG PUPS IN A BREEDING UNIT

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Department of Parasitology, ¹Greenhills Veterinary Clinic, Randfontein

A commercial dog breeding unit experienced problems with acute diarrhoea, often haemorrhagic, in German Shepherd Dog litters. No aetiologic diagnosis had been made. To determine whether coccidial infections were implicated, a survey was conducted to ascertain shedding of oocysts by dams, acquisition of coccidial infection by neonatal pups and whether bouts of diarrhoea were associated with peak oocyst production.

Oocysts recovered by faecal flotation were counted in McMaster chambers and allowed to sporulate. Specific identification was based on size of the sporulated oocyst: those > 30 µm in length were regarded as *Isospora canis*, while those < 20 µm in length were regarded as *I. burrowsi*; no specific identification was attempted for oocysts falling within the range of overlap between *I. burrowsi* and *I. ohioensis* (20-24 µm).

Oocysts were recovered from 26,0% of 484 faecal specimens from bitches and from 57,7% of 387 specimens from litters. *Isospora canis* was recovered from 26,4% of positive specimens, *I. burrowsi* from 6,7% and *I. burrowsi* / *I. ohioensis* from 80,4%. Simultaneous shedding of more than one *Isospora* species was confirmed in 9,5% specimens. No association between shedding of oocysts by bitches and their litters could be demonstrated, nor was there consistent association between bouts of diarrhoea and peaks of oocyst shedding.

AVOCADO (*Persea americana*) POISONING IN OSTRICHES

W.P. Burger, T.W. Naudé¹, I.B.J. van Rensburg², C.J. Botha¹, & A.C.E. Pienaar³

Ostrich Research Centre, Oudtshoorn, ¹Department of Pharmacology and Toxicology, ²Department of Pathology, ³Department of Poultry Diseases

A farmer lost 9/120 one year old ostriches 1 to 2 days after allowing them 24 hours access to an avocado orchard consisting mainly of Hass (75%) and Fuerte varieties. The birds showed prostration and severe neck oedema before dying and at *post mortem* examination it was found that they had browsed extensively on avocado leaves and young fruit.

The toxicity of the fresh leaves and young fruit was initially tested by dosing to adult domestic hens at levels of up to 25g/kg over 24 hours. No mortalities or obvious clinical symptoms were noticed over the ensuing 7 days. Upon slaughter, however, most of the experimental birds showed histopathological evidence of mild focal cardiac and kidney lesions.

Subsequently a trial was conducted *in loco* on 6 ostriches of 2 months with both leaves and fruit of the two varieties. Respectively 10 and 15g/kg were dosed for 2 - 4 days to the 4 experimental birds and they all succumbed in 48 - 96 hours showing the same symptoms and macropathology as encountered in the outbreak.

Histopathologically the main features of both the outbreak and experimental cases were severe epicardial oedema, as well as congestion, haemorrhage, degeneration and acute necrosis of the myocardium. Necrotic areas were often infiltrated by heterophils and macrophages. In one instance early fibroplasia was noticed. In some areas atrophy of myocardial fibres was evident. A mild nephrosis was present in some birds.

The toxicity of leaves and immature fruit of Hass and Fuerte varieties of avocado to ostriches, and probably the domestic fowl, was proved beyond doubt. It is the first time that these two species have been shown to be susceptible to this intoxication.

THE USE OF MONOCLONAL ANTIBODIES FOR TYPING SOUTH AFRICAN FIELD STRAINS OF *Haemophilus paragallinarum* AND THE IDENTIFICATION OF NAD-INDEPENDENT ISOLATES

R.R. Bragg, L. Coetzee & J.A. Verschoor¹

Department of Poultry Diseases, ¹Department of Biochemistry, Faculty of Agriculture

Infectious coryza, which is caused by *Haemophilus paragallinarum*, is a serious problem amongst laying hens in South Africa. It has been seen that infectious coryza still occurs among chickens which have been vaccinated against this disease. A project was initiated to investigate the field isolates and determine the antigenic relationship between the field and vaccine strains of *H. paragallinarum*.

Various field isolates were collected and serologically grouped with the aid of monoclonal antibodies. The isolates were used to coat ELISA plates and the ELISA test was carried out using monoclonal antibodies. The effects on the Mab pattern of different growth conditions was also investigated and it was found that the pH as well as the NaCl content of the medium had profound effects on the Mab pattern.

The monoclonal antibodies were also used to examine isolates, made from chickens with typical symptoms of coryza, which did not require NAD for growth.

Various profiles were obtained when the "typical" *H. paragallinarum* isolates were grown under different conditions and were examined with the monoclonal antibodies. Some of the NAD-independent isolates made from chickens were also found to react strongly with the monoclonal antibodies, leading to the theory that these were "atypical" *H. paragallinarum*. This phenomenon has been detected in other *Haemophilus* species, where the NAD independence is coded for by a plasmid. Various attempts have been made to prove that the "atypical" isolates also carry a similar, or the same plasmid.

A COMPARISON OF OILS IN THE LIPID ASSIMILATION TEST IN DOGS

W.L. Berry & F. Reyers

Department of Medicine

Chronic diarrhoea is a diagnostic problem in dogs, as definitive tests for maldigestion/malabsorption are expensive and not frequently available. The diagnosis of exocrine pancreatic insufficiency has been greatly aided by the introduction of the trypsin-like immunoreactivity test, which is expensive, however, and consequently run in batches. Malabsorption due to infiltrative bowel disease may only be confirmed by small intestinal biopsies, with inherent surgical risks and expense. In these patients evaluation of the faeces for excessive fat, starch, and protein, combined with a trypsin digestion and the lipid assimilation test, are qualitative procedures to evaluate the digestive and absorptive status of the intestinal tract. These techniques are easily performed in private practice, and may preclude the necessity of expensive diagnostic procedures if the tests reflect normal assimilation.

The lipid assimilation test involves comparing plasma lipaemia/turbidity pre- and post-administration of a long-chain triglyceride vegetable oil. The use of sunflower oil appeared to give equivocal results in both patients and control dogs.

The aims of this study were to evaluate the effect of four different oils on plasma lipaemia for application in the lipid assimilation test in dogs, and to make recommendations as to the method of assessing lipaemia.

Four different oils (sunflower, maize, olive, and cottonseed oil) were administered to 12 normal dogs on separate occasions. Blood samples were drawn in heparin prior to oil administration, and subsequently at hourly intervals for four hours. The plasma was evaluated for optical density, visual grading score, triglyceride and total lipid concentration.

This study showed that oil type affects the lipid assimilation test with respect to the method and time of assessing plasma lipaemia. In addition, and contrary to previous reports, determining the optical density, triglyceride and total lipid concentrations did not improve on the sensitivity of visual grading. The ideal sampling time appeared to be two hours post oil administration - when changes in parameters became significant, and the contribution of between-dog differences to total variance was small. The largest sources of variation are attributable to the method of assessing lipaemia, oil type, and time of sampling, with little between-dog variation.

IMPROVED FERTILITY OF FROZEN-THAWED CANINE SEMEN INSEMINATED INTRAVAGINALLY AFTER THE ADDITION OF AUTOLOGOUS PROSTATIC FLUID

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Intravaginal insemination of frozen-thawed canine semen usually yields highly unpredictable fertility, mostly with very poor pregnancy rates. This study was designed to establish whether litter size, pregnancy rate and conception rate could be improved by the addition of autologous prostatic fluid to the frozen-thawed semen prior to insemination.

Twenty reproductively sound German Shepherd bitches were used. The bitches were stratified according to their ages and randomly assigned within strata to Treatment (Group T, n = 10) or Control groups (Group C, n = 10). All bitches were inseminated daily with frozen-thawed semen for the duration of that stage of vaginoscopic oestrus during which the vaginal folds were shrunken and angular. Bitches in Group T were inseminated with semen to which 7-10 ml of frozen-thawed sperm-free autologous prostatic fluid had been added immediately prior to insemination. No prostatic fluid was added to the semen used to inseminate bitches in Group C. Each inseminate contained 108 progressively motile sperm post-thaw. Semen was deposited in the fornix vaginae with the aid of a disposable plastic bovine AI pipette attached to a syringe. During insemination and for 10 minutes thereafter the bitch was held with her hind quarters raised by 45-80°. Ovariohysterectomies were performed on all bitches between Days 17 and 25 of dioestrus and the foetuses and corpora lutea counted.

For Groups T and C the mean number of foetuses per cycle (litter size) was 5,2 and 2,4 respectively while the mean ratio of foetuses to corpora lutea (conception rate) was 0,577 and 0,232 respectively. The pregnancy rate for Groups T and C was 100 % and 60 % respectively.

The addition of autologous prostatic fluid to frozen-thawed canine sperm significantly improved the litter size ($p = 0,023$), the conception rate ($p = 0,0127$) and pregnancy rate in bitches ($p = 0,043$).

Further research is necessary to establish whether the observed improvement in fertility of frozen-thawed canine semen can be ascribed to a chemical constituent of prostatic fluid or due to a physical effect e.g. increased volume or decreased viscosity of the inseminate.

IS THE AZOTAEMIA IN CANINE BABESIOSIS AN INDICATION OF RENAL DISEASE?

F. Reyers

Department of Medicine

Reports of azotaemia (reflected by a raised serum/blood urea level) in canine babesiosis are common. The usual interpretation placed upon this finding is that this is a reflection of secondary renal disease precipitated by haemoglobinuric or ischaemic nephrosis. If this interpretation is valid then serum creatinine should be similarly increased. This hypothesis was tested on sera from animals admitted to the Onderstepoort Veterinary Academic Hospital during the period October 1990 to February 1992.

Frozen, stored sera from all clinical cases from which serum had been submitted for urea and or creatinine determination and where a specific diagnosis had been made, constituted the non-babesiosis group ($n = 293$). This group included 42 confirmed renal disease cases (REN) and 35 confirmed post-renal disease cases (POR). Sera were also drawn from 93 cases of canine babesiosis (BAB) and 9 cases of "red babesiosis" a condition where the babesiosis does not lead to anaemia (RED BAB), from which serum had been submitted (not necessarily for urea or creatinine) admitted during the same period. These sera were analyzed for serum urea and creatinine levels.

Animals were classified into 4 groups according to the urea level: Normal ($\leq 1,0$ mmol/l); Mild (up to twice top-normal); Moderate (2 to 4 times top-normal) and Severe (more than 4 times top normal) and similarly 4 groups according to the creatinine level: Normal (≤ 132 μ mol/l). The urea to creatinine ratio was calculated and formulae relating the degree of increase (above normal) of urea to that of creatinine were also applied.

The study showed that, as a rule, an increase in serum urea in REN (88%) and POR (66%) cases was associated with a similar proportional increase in serum creatinine. BAB cases did not show this pattern, with the exception of a small number of cases (10%), whereas 67% RED BAB did. More than half the BAB cases presented with an increased serum urea and normal creatinine.

It appears that typical azotaemia as a result of decreased glomerular filtration rate, recorded in the greater majority of REN, POR and RED BAB cases, occurs very rarely in BAB cases. The increased serum urea should thus be ascribed to non-renal causes. This study does not suggest what the source of urea may be but it is not unreasonable to speculate that the catabolism of haemoglobin and erythrocyte stroma could lead to a significant degree of ammonia loading. Furthermore, this study does not show that no renal pathology occurs in canine babesiosis, only that such pathology (if present) does not usually manifest itself in renal filtration dysfunction.

RESEARCH PROGRAMME/NAVORSINGSPROGRAM

Plakkate/Posters

'n ANALISE VAN 5 KOMMERSIËLE HONDERANTSOENE OOR 'n 12-MAANDE TYDPERK

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Departement Veterinêre Etologie

Uit veldverslae word kommersiële hondekosse van tyd tot tyd gekoppel aan kliniese probleme. Die doel van die ondersoek was om vas te stel of daar 'n noemenswaardige variasie in die voedingstowwe van kommersiële honderantsoene voorkom, aangesien dit in grootmaat vervaardig word.

Kommersiële honderantsoene van 5 landwye maatskappye is maandeliks, vir 12 maande, volgens die Weende-analise (vog, as, ru-proteen, ru-vet, ru-vesel, Ca en P) getoets. Die aankope is by 'n hipermark gedoen en gebaseer op hoe die gemiddelde verbruiker (kliënt) dit aan die einde van elke maand saam met die kruideniersware sou aankoop. Elke monster is in triprikaat getoets (bo, middel, onder) om die waardes te verkry soos dit aan die hond gevoer word. Dit dien ook as 'n 3-dubbele kontrole.

Die resultate van die rantsoene is geëvalueer teenoor die bepaling van Wet 36 van 1947 op veevoer, misstowwe, landboumiddels en veemedisyne. 'n 7% variasie is toegelaat vanaf die wetlike bepaling om voorsiening te maak vir grootmaat vervaardiging. Elke maand waar afwykings meer as 7% vir enige fraksie van die Weende-analise voorgekom het, is dit as 'n afwyking aangeteken. Die evaluasie toon die volgende frekwensie-afwykings van die rantsoene oor die 12 maande periode:

Rantsoen 1 - 16,6%

Rantsoen 2 - 11,1%

Rantsoen 3 - 34,7%

Rantsoen 4 - 15,2%

Rantsoen 5 - 11,1%

Uit die resultate het Rantsoen 2 ('n droë rantsoen) en Rantsoen 5 ('n nat rantsoen) die minste afwykings teenoor die wetlike vereistes getoon. Rantsoen 3 ('n droë rantsoen) het die meeste afwykings getoon.

Daar word aanbeveel dat 'n akkreditasieskema vir kommersiële honderantsoene ingestel word, wat die rantsoene deur 'n onafhanklike veteriner laboratorium op 'n deurlopende basis kan evalueer. So 'n skema kan die professie se betrokkenheid by sy kliënte se diereprodukte aantoon en verdere vertroue in die produkte bevestig. In Kanada lewer die professie reeds so 'n diens aan die hondekosbedryf.

HOW *Haemoproteus columbae* CAUSES MORTALITY IN DOVES

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Haemoproteus columbae is a common blood parasite of members of the dove family, Columbidae. This parasite is considered to be benign under natural conditions. However, mortalities can occur under intensive conditions such as in aviaries where the pigeon lousefly *Pseudolynchia canariensis*, which acts as vector, might be common causing abnormally high *H.columbae* infections.

A life cycle in the tissues of the dove is proposed where sporozoites which enter the bloodstream form first generation schizonts in the endothelial cells of the bloodvessels. The merozoites which are released from these schizonts form second generation uni- or multilocular schizonts within muscle cells. When the merozoites are released from these second generation schizonts extensive muscle necrosis results and the release of toxic materials during this process could account for mortality.

Previous reports suggested that "aberrant" *Leucocytozoon*-type organisms caused mortality in aviary birds. We now believe that at least some of those mortalities were caused by heavy infections of *Haemoproteus*.

THE INFLUENCE OF INTRA-UTERINE INSTILLATIONS ON THE ENDOMETRIUM OF THE MARE

- an electron microscopic study

Enette van Dyk

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Various agents are routinely used in practice as intra-uterine treatment in the mare. The potential damage that may be inflicted in the endometrium of the mare by such instillations were investigated by electron microscopy.

Four groups of 4 mares were selected with regard to their uterine health status. The selection criteria were mainly the anatomy of the perineum and histopathological examination of the endometrium. The endometrial biopsy specimens were examined before, 1 and 4 weeks after treatment by scanning electron microscopy. Uterine biopsy material was also examined for possible bacterial contamination before and after instillations to exclude any inflammation caused by bacteria or infection. Four groups of 4 mares were given an intra-uterine instillation of (a) urea-glycerol-saline solution, (b) physiological saline, (c) oxytetracycline, and (d) metacresol-sulphonic acid/formaldehyde (1%), as a single treatment.

Biopsies taken before and after treatment, with physiological saline and urea-glycerol-saline, caused no changes in the image of the luminal epithelium. However, hyperplasia of the luminal epithelium was a distinct feature after the administration of oxytetracycline and metacresol-sulphonic acid/formaldehyde. Lesions were still present 4 weeks after treatment.

Intra-uterine treatment in mares should be performed with due discretion. The endometrium of the mare is extremely sensitive to irritant substances and is therefore easily damaged. The normal endometrial function is affected and may result in infertility. Such substances must therefore be avoided in the treatment of the uterus of the mare, especially in the light of delayed recovery.

SOME ULTRASTRUCTURAL FEATURES OF TISSUE CYSTS AND BRADYZOITES OF *Neospora caninum*

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Neospora caninum is a cyst-forming protozoan parasite that morphologically closely resembles *Toxoplasma gondii*. An ultrastructural study of the tissue cysts and bradyzoites of *N. caninum* in canine brains was undertaken to reveal possible similarities with the North American strains of *N. caninum* and the *Neospora*-like parasite of cattle.

Formalin-fixed tissues were post-fixed in osmium tetroxide and processed for routine transmission electron microscopy. Wax-embedded tissues were dewaxed in xylol and then processed according to the same methods. Sections were examined using electron microscopy.

The parasite cyst and the bradyzoites had numerous previously described features of *N. caninum* and the *Neospora*-like parasite of cattle. These included a thick, granular cyst wall and tubulo-vesicular structures in the cyst ground substance. Bradyzoites contained numerous rhoptries and many showed micronemes arranged perpendicular to the bradyzoite pellicle. A few micropores were detected in the bradyzoite pedicle, a feature lacking in the original descriptions of *Neospora caninum*. Vesicles containing a mixture of smaller vesicles and short flat membrane segments were also observed in many bradyzoites. Unique features included large variations in the thickness of the cyst wall, formation of rudimentary septae and an amorphous lipid-like inclusion within one tissue cyst.

The results show that the South African parasite has similarities with both canine *N. caninum* and the *Neospora*-like parasite of cattle. The bradyzoite vesicles that contained small vesicular structures and short, membranous segments have not previously been described in parasites of canine origin. This raises the possibility that the parasites are identical and only variations within the staining procedures and tissue preparation account for the described discrepancies.

INCLUSION BODY HEPATITIS IN A SENEGAL PARROT (*Poicephalus s. senegalus*)

Joyce Pearson

Department of Pathology

Adenovirus infection is a common infection of both mammals and birds. Although the role of adenovirus (Group I) as a primary pathogen in birds has not been established, mortalities due to this infection have been documented in several species, including chickens, turkeys, pigeons, budgerigars, love birds, cockatiels and parrots. Several syndromes in birds have been associated with adenovirus (Group I) infections, including drop in egg production and food consumption, tenosynovitis, **inclusion body hepatitis** and respiratory diseases. Vertical (in embryonated eggs) and horizontal modes of transmission (through faeces and respiratory secretions) are recognised in inclusion body hepatitis. Following a short incubation period of 24 to 48 hours, affected animals may die acutely.

A Senegal parrot which died acutely, was presented for necropsy. The most significant macroscopic lesion was mottling of the liver. The light microscopic lesion in the liver of the parrot was characterised by severe acute multifocal coagulative necrosis. Basophilic intranuclear inclusion bodies were present in many hepatocytes scattered throughout the parenchyma of the liver, predominantly in viable hepatocytes peripherally to the necrotic foci. The inclusion bodies filled the nucleus and in the majority of cases induced nuclear enlargement with partial or total obliteration of the cytoplasm. The cytoplasmic remnants in these cells stained deeply eosinophilic and in some cases, basophilic.

Electron microscopically the nuclear material was almost completely replaced by large numbers of non-enveloped, icosahedral virions arranged in a uniform crystalline array. The electron density of the virions varied. Total disruption of the nuclear membrane was present in some instances. Scattered groups of virions were also present in the cytoplasm.

The clinical history in conjunction with the gross, histopathological and ultrastructural pathology led to confirmation of the diagnosis of inclusion body hepatitis and emphasised the value of detailed morphological studies in arriving at a substantive diagnosis.

Grateful thanks to Dr W J Botha for supplying the histopathological material used in this investigation.

ALBENDAZOLE SLOW-RELEASE CAPSULES: EFFICACY AND PASTURE INFECTIVITY

J.P. Louw & R.K. Reinecke

Department of Parasitology

Intra-ruminal slow-release capsules were developed for the controlled and continuous release of chemicals into the gastro-intestinal tract, obviating the need for regular treatments. The objectives of the present study were to determine the effective life-span of an intra-ruminal slow-release capsule charged with albendazole, its efficacy against endemic field strains of nematode parasites of sheep and its effect on the infectivity of the pastures in the southern Cape Province.

Over a period of 10 months, 6 - 8 replicates of 3 anthelmintic control programmes applied in 20 experimental paddocks on the Tygerhoek Experimental Farm in the southern Cape Province were studied. A total of 215 sheep were slaughtered, their nematode parasites recovered and the burdens compared.

Trichostrongylus was controlled for 91 days and *Haemonchus* and *Teladorsagia* for at least 61 days. Overall anthelmintic efficacy was 96,4% at 61 days, but declined to 80% at 91 days, when the capsules were found to be exhausted.

In 10 months the albendazole slow-release capsules reduced the infective potential of the pasture by 90,4% when compared to weekly treatments with albendazole suspension. Resistance of the nematode parasites to the anthelmintic was not exacerbated by the continuous treatment with the capsules.

OFFSPRING RECOGNITION IN FEMALE POUCHED MICE (*Saccostomus campestris*)*Lilian M. Westlin*

Department of Theriogenology

Many mammalian mothers care only for their own offspring, and in doing so must have some means by which they can distinguish their own young. Particularly mothers of group-living species, that normally restrict maternal care to their own offspring must employ specific cues to identify them, and in some cases these have been shown to be olfactory. These olfactory cues may either be emitted by or placed on the young, and it has been suggested that e.g. in rats, the mother emits odours that change with their diet and that the pups may be marked by these odours. Solitary mammalian mothers who have young that remain in isolated nests may simply restrict their care to those within the nest and may therefore not need specific cues to distinguish between their offspring and those of others. If the suckling pups are not nipple-clinging, this would be an advantage as well.

Capability of distinguishing between own and alien offspring was studied in the female pouched mouse, *Saccostomus campestris*, a solitarily living, burrow-dwelling small rodent, indigenous to Africa, whose pups are not nipple-clinging. Alien pups (n = 857) of different age-groups (0-30 days) were introduced to lactating females (n = 191) with own pups (n = 1053) of different age-groups (0-20 days) over a period of 3 years. The total number of pups per female were made up to 10 (e.g. 7 own + 3 alien or 4 own + 6 alien).

The "fostermother" readily accepted and successfully reared alien pups up to an age of 20 days. Weaned alien pups, introduced when 25 or 30 days old, were viciously attacked by the fostermother and had to be removed, although own offspring or earlier introduced alien pups that were allowed to remain with the female after weaning were fully accepted. It appears that up to weaning-age, female pouched mice may not distinguish between own and alien offspring, but rather between suckling and weaned pups, while after a pup is weaned (although the female may still be lactating), it will be regarded as alien and would in the wild be chased away.

ASSESSMENT OF ERYTHROCYTE REGENERATION IN ANAEMIC CANINE PATIENTS

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It has been proposed that the reticulocyte production index (RPI), an index of assessing adequacy of bone marrow response to anaemia derived from human patients, is a better indicator of bone marrow response than the reticulocyte count. It corrects for both the relative increase in reticulocytes due to the decreased total red blood cells, and the time required for reticulocytes to mature in circulating blood. It has been observed that the RPI in severely anaemic cases suggested an inadequate bone marrow response. As it appears to be unlikely that all severely anaemic animals are incapable of responding to the anaemia a retrospective survey of anaemic patients was conducted in order to verify the above observation and investigate the possibility of adjusting the RPI calculation to provide more meaningful results.

The haematocrit, reticulocyte count and diagnosis for 200 anaemic dogs (with haematocrit $\leq 30\%$) admitted to the Onderstepoort Veterinary Academic Hospital were extracted from the 1991/92 laboratory records. The RPI was calculated and plotted against the haematocrit.

The results confirmed the observation that severely anaemic animals are apparently not capable of mounting an adequate bone marrow response, based upon the calculated RPI. It appeared, from the results, that the RPI calculation does not accurately portray the real state of affairs and an amended calculation was presented.

It is highly unlikely that reticulocyte production is restricted in all severely anaemic dogs (regardless of cause of anaemia) even to the extent of suggesting that the reticulocyte production in some of these animals, in terms of cells produced per day, is below that of a non-anaemic dog. Consequently, it is recommended that the amended calculation be used to eliminate the apparent bias produced by the published RPI formula and that regeneration of anaemic canine patients be assessed by this new formula.

PARASITES OF CAPTIVE AND FARMED CROCODILES IN SOUTH AFRICA

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At present there are 40 crocodile farms in South Africa breeding and producing Nile crocodile, *Crocodylus niloticus*. Wild-caught breeding animals, imported from neighbouring countries, often carry parasites which require intermediate hosts, while intensively reared young stock are more likely to be affected by parasites with direct development. The material for this study came from routine post mortem examinations.

Hepatozoon pettiti is transmitted by tsetse flies, *Glossina* spp., which feed on crocodiles. The tsetse flies in turn are swallowed when biting in the gaping mouth. Schizonts are found in the liver, while gamonts invade circulating red blood cells. Oocysts of an *Eimeria* sp. from hatchlings and yearlings presented a pitted outer wall like those of *E. caimani* and *E. paraguayensis* of the spectacled caiman, *Caiman crocodilus*. The sporulated sporocysts were found entrapped in the inflamed mucosa and submucosa of the intestine. *Giardia*-like flagellates were found in the small intestine of hatchlings.

A strigeoid trematode *Pseudoneodiplostomum thomasi* was found in the jejunum of a wild-caught adult male crocodile. Mature forms of the crocodilian ascaridoids *Dujardinascaris dujardini*, *D. madagascariensis* and *Hartwichia rousseloti* were found in the stomach of crocodiles; these nematodes probably all utilize fishes as intermediate hosts.

Large numbers of rhabditids were found in the bile ducts of the liver of a dwarf crocodile, *Osteolaemus tetraspis*. It is believed that these parasites were too numerous and their habitat too specialized for them to be opportunistic parasites.

Pentastomes, *Sebekia* spp. are often found in the lungs of wild-caught crocodiles. They also utilize fishes as intermediate hosts.

No cestodes are known from crocodiles. Filarioids, which have been described from African crocodiles, were not found in the present material.

LIGHT AND TRANSMISSION ELECTRON MICROSCOPY OF AN *Aegyptianella* sp. OF THE HELMETED GUINEAFOWL

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An *Aegyptianella* sp. was isolated from wild helmeted guineafowls by syringe transmission to domestic guineafowls. The isolates were unable to infect chicks and turkey poults.

Two intra-erythrocytic forms were found by light microscopy: Ring-shaped forms similar to those of *A. pullorum* and irregular shaped forms, typical of the guineafowl isolates.

Transmission electron microscopy revealed that the organism develops from an initial body in a membrane-bound vacuole. After an early binary fission the daughter organisms grow in length, folding on themselves and stretching the vacuole into an irregular, pleomorphic shape. At maximum size the organisms are packed tightly and appear knotted. This appears to be followed by a series of binary fissions, accompanied in places by an apparent doubling of the trilaminar membrane. The final stages consist of slightly elongated daughter organisms in a near spherical vacuole.

Because of the sausage shape of the intermediary stage the organism has been named *Aegyptianella botuliformis* Huchzermeyer, Horak, Putteril & Earlé 1992 (Rickettsiales: Anaplasmataceae).

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