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PRESIDENT'S NEWSLETTER

Greetings All. Well, what an excellent Annual Meeting we had in Sydney! I can tell those of you who could not get there that the quality of presentations was extremely good, led by those of our invited speakers who really gave generously of their expertise. The shiny new venue at the Veterinary School was pleasant and effective and helped to generate a good feeling. I heard many positive comments, and perhaps the most telling outcome was that one of the invitees was so favourably impressed that he immediately applied to join the Society. I now take this opportunity to publicly thank the conference organisers, Tony Ross, Malcolm France and Paul Gill, for putting it all together, and all the contributors for giving us such good value. It was particularly pleasing to have several presentations from young people in training (at least four from UQ) and I hope we will see this continue.

At the business meeting there was some sharp discussion generated by several issues, most notably the concept plan drafted by the Executive for a new arm of the Society to be involved (amongst other things) in continuing education and the application of quality assurance processes. The future of this plan hangs largely off the outcome of the national review of laboratory services sponsored by AAHC, currently underway and due to report at the end of the year. In the meantime the Executive looks forward to receiving comment and advice from the membership on these or any issues relating to the interests of our Society. So keep letting us have your opinions.

With very best wishes to all.

EDITORIAL

Well, this issue of the report coincides with the completion of one year as your editor. There have been some “trials and tribulations” but all in all, things have worked out well. No complaints have been received about the modifications made to the report and I am more than pleased by the success of using e-mail to submit articles for publication.

My thanks to those authors who contributed to the case reports. Without you we could not have published at all. For those of you who are content to read, but not contribute - have a go. These reports are for everyone’s benefit. Don’t forget contributions do not have to take that form. They could be submitted as comments and suggestions or as letters to the editor about the Society itself.

By the time you read this, the Annual General Meeting will be well and truly over. The next issue will therefore contain the minutes of the meeting. The proceedings of the meeting will be published separately.

For the benefit of those who did not go the AGM, the vote for affiliation with the Australian Veterinary Association was lost 36 votes to 42.

Akabane virus induced encephalitis in neonatal calves

John Glastonbury, Elizabeth Macarthur Agricultural Institute

In the middle of April 1998, two 2-day old male calves were received from a Camden district dairy. The Friesian calf passed into titanic spasms when touched, adopting a saw-horse position, while the Friesian cross calf had displayed flaccid paralysis since soon after birth.

Gross pathological findings were not dramatic. The crossbred calf had sucked, whereas the Friesian had not. Moderate oedema and hypostatic congestion were noted in the lungs of the former.

Histologically, both calves had moderately severe non-suppurative encephalitis, predominantly involving the brain stem, throughout in the crossbred and from the mid-brain caudally in the Friesian, and the deep white matter of the cerebellum. The inflammation was characterised by many perivascular infiltrates of lymphocytes, occasional neuronophagic nodules and isolated necrotic neurons.

Brain fluid of both calves was obtained from fresh tissue which had been retained following bacteriological culture. These fluids gave inconclusive reactions in the screening ELISA for the Simbu group of viruses but were positive in the Akabane ELISA. As the Friesian calf was deprived of colostrum, in utero infection with Akabane virus was confirmed in that animal.

During March and April, sentinel herds under the National Arbovirus Monitoring Program at Camden and Nowra, respectively, seroconverted to Akabane virus.

The epidemiological, pathological and serological findings strongly implicate Akabane virus infection towards the end of gestation as the cause of the encephalitis. As Camden is on the perimeter of the endemic area in New South Wales for this virus, further manifestations of infection, such as arthrogryposis and hydranencephaly can be expected as the calving season progresses.

New England closantel resistance survey

Stephen Love, State Worm Control Coordinator, NSW Agriculture, Armidale

As a one-time veterinary pathologist (RVL Armidale) and still a member of the ASVP, I would like to update colleagues on an important parasitological matter, that of anthelmintic resistance, specifically closantel resistance. Remember that worms are pathogens too, and that internal parasitism is said to be the most significant disease of sheep in Australia.

The field part of New England closantel resistance survey has just been completed, and preliminary results were presented at the Australian Veterinary Association Conference, held in Sydney on 18-22 May (Love SCJ, Lloyd, JB and Davis EO).

At this stage it appears that around 30% of farms in the New England region have Barber's Pole worm resistant to closantel, even more if those classified as "emerging resistance" are included. The prevalence of closantel resistance appears to vary quite a lot over the region, down around 10%-20% in some areas, up to 50% or more in others. This is bad news for the New England as closantel is a critical component of the WormKill program as regards Barber's Pole control. Some farmers have reverted to the practice "pre-closantel" (pre-1982) of frequent drenching in summer, while others are controlling Barber's Pole with Cydectin®, a macrocyclic lactone with some persistency against this parasite. This latter trend is particularly worrying, as it means that there will be greater selection for resistance to this broad spectrum drench family. Already we have a "SuperWorm" in the New England area, a strain of Barber's Pole resistant to both closantel and the ML family.

We are pushing "integrated worm management", which employs various control options in addition to drenching strategies, but there are no easy answers for farmers with closantel resistance. The "strands" of an integrated approach include the right drench at the right time, grazing management, flock management, breeding resistant animals ("Nemesis" program), nutrition, and regular monitoring (WormTests and resistance testing - DrenchRite® or DrenchTest) coupled with professional advice. Hopefully vaccines and nematophagous fungi will be added to the armoury in the not too distant future.

As to vaccines, Dr Joan Lloyd (Veterinary Research Officer, Parasitology, EMAI) has begun preliminary work on an irradiated *Haemonchus* larval vaccine. This is a live larval vaccine. The idea is that the larvae can establish in dosed sheep and evoke an immune response, but will be unable to reproduce because their DNA has been damaged by irradiation. This work is supported by funds from NSW Agriculture's R&D Initiatives fund.

Joan has also been working hard on refining the lab-based test (in vitro migration assay) for detecting closantel resistance in *Haemonchus*, and presented papers on this test and DrenchRite®, at the recent Australian Veterinary Association conference.

NOTE THE FOLLOWING NSW REPORTS WERE INADVERTENTLY OMITTED FROM THE PREVIOUS EDITION OF THE ASVP NEWSLETTER

Norseq Veterinary Pathology Group Meetings

Paul Gill, NSW Agriculture, Wollongbar

A Norseq meeting was held at Queensland University 6 December. Bruce spoke on the pathogenesis of *Cryptosporidium parvum*. Case presentations included haemorrhagic enteritis virus in turkeys (Narjit), spongiform myelopathy in a Birman kitten (Michael Rozmanec) and ceroid lipofuscinosis in Merino sheep (Roger Cook) and Border Collie Dogs (Wayne Robinson).

Bovine Salmonellosis

John Glastonbury, Elizabeth Macarthur Agricultural Institute

Towards the end of 1997, salmonellosis was frequently diagnosed in dairy cattle. *Salmonella* Dublin infection was associated with depression, anorexia, occasionally diarrhoea, and death in 1 to 3-month-old calves on four farms, and severe diarrhoea in adult cattle on another. Material for pathological examination was only submitted from one of the farms, with histological findings including visceral congestion and moderate, acute, multifocal hepatic necrosis.

Five-week-old calves on another dairy were pyrexia and had severe diarrhoea. In this instance *Salmonella typhimurium* was the culprit. Sections of jejunum revealed acute, segmental necrotic enteritis, with segmental necrosis of the lamina epithelialis mucosae, many crypts of Lieberkühn containing necrotic debris and mild infiltration of the superficial tunica submucosa with mononuclear leucocytes.

What was described as a "calf rearing operation" experienced considerable difficulty with dysentery. Faecal samples contained large numbers of *Eimeria bovis* and *zuernii* oocysts and yielded profuse growths of *Salmonella Zanzibar*.

Scirrhous uterine adenocarcinoma

John Glastonbury, Elizabeth Macarthur Agricultural Institute

A grey headed flying fox, *Pteropus poliocephalus*, "fell out of its tree" in the Royal Botanic Gardens. Necropsy showed the animal to be in an advanced stage of pregnancy and a white, firm tumour, about 2cm in diameter, in the uterine wall. Histologically, the tumour was composed of irregular cords and tubules of epithelial cells set in a fibrous stroma. Epithelial cells had a high nuclear to cytoplasmic ratio and low mitotic index, with individual ones undergoing apoptosis.

Avian influenza at Tamworth

John Boulton, RVL Wollongbar; George Arzey and Rod Reece, EMAI

The exotic disease, virulent avian influenza (AI) was confirmed in poultry near Tamworth in late November 1997. Two hundred and ten thousand breeders and their progeny and 1.2 million fertile eggs, 261 emus and 147 emu eggs were destroyed, along with hundreds of tons of grain, litter and other waste. The cost, including compensation, is expected to reach \$5 million.

The presumed index property, a breeder farm with 4 units each consisting of 4 sheds (each shed housing 8000 birds) experienced a rise in mortality in one shed in mid November. In the first affected shed which housed 40-week-old breeders, the daily mortality escalated from less than 25/day to 816/day within five days. Cumulative Mortality in the 16 sheds on the farm during two weeks varied from 2.5% to 98%. In the first affected shed, response to water medication was reported by the company veterinarian within 48 hours of treatment. This caused some delay in further investigation of the case. The low mortality (less than 3% cumulative) was evident even in some sheds that seroconverted to AI.

The early signs were a drop in egg production and some of the infected flocks, respiratory distress with gasping and gurgling and rapidly increasing mortality in some sheds. Watery diarrhoea was also evident. Some birds, particularly in the shed that responded to medication, had bluish wattles and combs. Very mild facial oedema was evident in a small number of birds, particularly the roosters. The severe oedema, congestion and cyanosis observed in previous outbreaks in Australia were not a feature of this outbreak.

Autopsies of 130 dead birds and 60 moribund birds showed an inconsistent picture. Mucoïd to haemorrhagic (very few) tracheitis was evident in some birds. Perihepatitis was observed in some birds. Disseminated haemorrhage was not a feature although caecal tonsils were congested in some birds.

Histologically there was multifocal small foci of acute necrosis in liver and kidney, perielipsoidal fibrinoid necrosis in spleen, and fibrinoid deposits, oedema, mild mixed cell infiltration into the tracheal lamina propria and loss of mucosal epithelium. Although the pancreases were later shown to be positive for AI virus, foci of necrosis could not be discerned.

AI was diagnosed on the basis of seroconversion to AI (using ELISA) between October and November. (Sera that had been collected on 15 October by the company for routine monitoring was compared to sera collected during the investigation). The diagnosis was confirmed by fluorescent antibody staining of pancreatic smears and isolation of AIV by egg inoculation. The virus was typed as H7N4 (not previously reported in any of the outbreaks in Australia). Further studies by AAHL confirmed that the virus was highly pathogenic to chickens.

One week later, after depopulation of the first infected farm commenced, virulent AI was detected on another nearby breeder complex owned by another company. Daily mortality in a shed of 5,000 60-week-old birds rose from less than 5, to 22, then to 44. Lesions included mucoïd and haemorrhagic tracheitis. Pale foci within and along the edge of the pancreas (due to necrosis),

and organ ecchymoses were not able to be confirmed as lesions. Some birds which had been found dead, had no lesions. AI infection with H7N4 was also detected in clinically normal emus on a third poultry farm. Serum and cloacal swabs, which had been collected for surveillance purposes proved positive by ELISA and virus isolation respectively. Some waterfowl carry AI viruses but these are usually non-pathogenic to chickens on initial infection and require chicken-to-chicken passage to become virulent. Poultry on the first farm may have been infected via their drinking water, which was drawn directly from the Peel River where waterbirds were known to visit. The drinking water was chlorinated but difficulties were being experienced because of high organic matter content. The mode of transmission to the second and third farm has not been determined. Aerosol spread from the first farm to the other two farms cannot be ruled out as the minimum temperature, humidity and wind direction during at least two nights were favourable to such a mode.

Serological evidence of avian influenza but not H5 or H7 has been detected in local teals. The significance of this finding is obscured. Intraperitoneal barbiturate was the best means of euthanasia, partly because of the birds' ages; decapitation and asphyxiation in CO₂ were also used. The sedative, alphachloralose, given by drinking water, had an unacceptably variable effect.

Thrombo-embolic meningo-encephalitis in feedlot cattle

Steven Hum and John Glastonbury, EMAI

Two separate outbreaks of thrombo-embolic meningo-encephalitis have been diagnosed in a feedlot near Holbrook. In the first case, two 15 month-old steers died suddenly three weeks after introduction. Both steers were in good body condition and gross pathologic findings included haemorrhages in the gastrointestinal tract and fluid filled small intestines.

Histopathology of the brain revealed septic fibrin thrombi in blood vessels of leptomeninges and in the parenchyma which were associated with diffuse necrotising vasculitis, focal malacia and a neutrophilic influx. Similar fibrin thrombi were observed occasionally in the blood vessels of alveolar capillaries and in the submucosal vessels of the colon and there was a focal area of necrosis and septic embolus in the heart. A Brown and Brenn stained section of the brain showed the septic emboli to contain Gram-negative rods of a morphology consistent with *H. somnis*.

Two weeks later, three more steers died in similar circumstances. Apart from some nasal discharge, no gross abnormalities were evident at gross pathology by the investigating veterinarian. Histopathology on the three brains submitted revealed varying degrees of multifocal thrombo-embolic septic thrombosis of the leptomeninges and throughout the parenchyma in all three, leading to widespread microabscessation in one.

Unfortunately no fresh tissues were submitted for microbiology from any of these cases but the history and histopathology findings were consistent with *H. Somnis* infection.

Thrombo-embolic meningo-encephalitis was first reported in 1956 and over the next 20 years became a common and important disease of young cattle in feedlots in North America. Interestingly, its occurrence is relatively uncommon in Australia.

Enteric/visceral listeriosis in cattle

Steven Hum, EMAI; Chris Venning, District Veterinarian, Cooma

Four 14-month-old cattle died acutely out of a mob of 200 near Cooma shortly after gaining access to a broken silage bale. Other cattle in the mob were unaffected. Clinical signs were similar in all four and included severe depression, liquid scour containing fibrin tags and shreds of mucosa. Gross post mortem examination revealed a congested gastrointestinal tract, enlarged liver and greatly enlarged mesenteric lympho-nodes.

Histopathology of the small and large intestine collected from one animal revealed severe diffuse vascular congestion, diffuse mucosal necrosis and widespread ulcerations/loss of mucosa with extensive submucosal oedema and heavy transmural mixed inflammatory cell infiltration. There was widespread lymphatic thrombosis in the submucosa with occasional microabscesses and serosal oedema. The liver was congested and had multifocal acute hepatocellular necrosis throughout, some were infiltrated by neutrophils.

Gram stained sections of the intestine revealed large numbers of short Gram-positive rods morphologically typical of *Listeria* sp. in the mucosa and submucosa. Similar organisms were detected in some necrotic foci in the liver.

Primary culture of the liver, lympho-node and gut content revealed a profuse to moderate mixed growth, including *Listeria ivanovii*. Selective culture for Salmonella and Yersinia were negative.

Visceral listeriosis affects organs other than the brain and the principal clinical manifestations are those of abortion or septicaemia. Septicaemic listeriosis is uncommon in adult ruminants but has been reported in newborn lambs and calves, where in addition to focal hepatic necrosis, there is frequently a marked haemorrhagic gastritis and enteritis.

Lead Intoxication in cattle grazing in a paddock containing an ore treatment plant

Barbara Moloney, RVL Orange

Fifteen ex 50+ mixed age/sex Hereford cattle died over a period of months after exhibiting signs of dullness, recumbency and tooth-grinding. The animals were in light to fair condition and no prominent neurological signs were reported. The cattle had access to some areas of an ore treatment plant which had a stockpile of ore, processed ore concentrates and tailings. The lead content of the ore may have been up to 20%.

Blood lead levels were reported by the NSW Agriculture Diagnostic and Analytical Services, Wollongbar, to be in the range of 0.16 to 0.88 mg/L for samples submitted in EDTA (mean 0.66 mg/L) and in the range of 0.48 to 2.0 mg/L for samples submitted in Lithium Heparin (mean 1.1 mg/L). Normal blood lead levels for bovines are reported as <1.2 micro mols/litre (BVA Veterinary Laboratory Data) which converts to 0.25 mg/L. Subsequent tissue analyses had results varying from 150 mg/kg in faeces to 50 and 11 mg/kg in two tissue samples.

Laryngeal Chondritis in a Texel cross ram

Barbara Moloney, RVL Orange

A 16-month-old Texel cross ram presented with recent onset of signs of respiratory obstruction, became severely distressed when caught and died en route to the vet. Two 'purebred' Texels had died with similar clinical signs in the previous 15 months.

Gross pathology was described as "no particular obstruction could be found, except that the larynx appeared enlarged". Histopathology revealed extensive laryngeal oedema and haemorrhage with mixed inflammatory infiltrate. The cartilage segments in one section appeared to be separated by a large cleft of inflammatory tissue containing large amounts of fibrin and polymorphs. Another section had areas of mucosal ulceration with haemorrhage and exposure of the cartilage which was infiltrated with large numbers of filamentous organisms. There was also some inflammatory infiltrate spreading into the laryngeal muscles which may have caused further exacerbation of the condition.

The tissues submitted for the current case were laryngeal segments only, so it was not possible to determine the extent of gross structural changes. Also, non fresh tissues were submitted so microbiological culture was unable to be performed. Lane *et al.*, *Vet Record* 121: 81-84 (1987) describes cases like this which appear to occur in Texel type sheep. These sheep have heavy laryngeal ulceration and oedema as a result of abnormal anatomic relationships in the laryngeal area. Lane *et al* describes chronic suppurative changes in the arytenoids cartilages of the larynx which result in swelling and occlusion of the lumen.

Equine nodular collagenolytic granuloma

Graham Bailey, RVL Orange

A skin biopsy (approximately 5mm diameter) was submitted which was taken from a 2-year-old pony. The pony was kept in a paddock and lesions had been present for several months. Clinical signs; multiple discrete lesions over shoulders, chest, neck and ribs, small pimple-like. The submitting vet reported a response to washes with a peroxide based shampoo and penstrep injections.

No bacteria were seen on a Gram stain of the lesion and no growth occurred on culture on Sheep Blood agar incubated in 10% CO₂.

Histological findings revealed a normal epidermis. The dermis contained multiple foci with mineralisation and collagen degeneration centrally. This was surrounded by a zone with many eosinophils and histiocytes. One giant cell was observed.

The histopathology was consistent with a diagnosis of equine nodular collagenolytic granuloma. The cause is not known but arthropod injury is suspected.

Pneumocystis in laboratory mice

Malcolm France, University of Sydney

Three mice in a research colony with targeted disruption of a gene for immunoglobulin heavy chain ('heavy chain gene knockout mice') developed weight loss. On post mortem the lungs were pale, failed to collapse and had a slightly rubbery consistency. Histologically, there was an interstitial infiltrate of mononuclear cells which often included macrophages with foamy cytoplasm. Similar macrophages were present in many alveoli and some alveoli were filled with slightly foamy, eosinophilic material containing faint basophilic speckles. Staining with Grocott's methenamine silver revealed the presence of small cysts consistent with *Pneumocystis carinii* in some alveolar lumens.

Preventing disease due to *P. carinii* is recognized as one of the challenges in maintaining colonies of immunodeficient mice and some institutions even supply prophylactic trimethoprim-sulphonamide in the drinking water in an attempt to avoid this. While the problem has long been recognised in the widely used scid and nude mice, the above case serves to illustrate how it may also crop up among the rapidly expanding range of "boutique" immunodeficient mutants created through genetic engineering.

Suppurative meningitis in a Boer Goat due to Listeriosis

John Humphrey, Malcolm Lancaster, VIAS Attwood

Several Boer goats of different ages and gender died in a flock with access to silage. Some animals walked in unidirectional circles. One goat was necropsied. The CSF was cloudy and contained numerous neutrophils but no bacteria were observed. Histologically, the meninges were markedly thickened by large numbers of neutrophils and fewer macrophages. Blood vessels in the brainstem were cuffed by mononuclear cells and neutrophils, and occasional microabscesses were seen in the parenchyma. *Listeria monocytogenes* was cultured.

This case was considered atypical due to the marked neutrophilic response in the meninges and CSF. The association of the outbreak with cold weather and silage feeding is consistent with literature reports. The optimum temperature for the growth of *Listeria* is between 30°C and 37°C, but its ability to grow at lower temperatures may favour it over other microbes.

Non-suppurative encephalomyelitis possibly associated with sarcocystosis in a steer

Anita Gordon, Yeerongpilly Veterinary Laboratory, Queensland Department of Primary Industries

A yearling Angus steer with progressive hind limb incoordination over a period of 1-2 months was eventually destroyed when it became recumbent. The field veterinarian noted no significant gross pathology in brain or spinal cord.

Sections of cerebral cortex, basal ganglia, thalamus, midbrain, cerebellum and medulla revealed very mild inflammatory changes consisting of modest perivascular cuffs of mononuclear cells, and mild, focal to diffuse gliosis. Mild neuronal satellitosis and possible neuronophagia were evident in the thalamus. Changes in the spinal cord included Wallerian-type degeneration characterised by vacuolation of outer white matter tracts by numerous digestion chambers together with reactive astrocytosis. A few spheroids were apparent in cervical cord. There appeared to be reasonably uniform involvement of dorsal, lateral and ventral funiculi in both cervical and lumbar cord. Inflammatory changes in the cord were confined to a single large glial nodule in the cervical spinal white matter.

The only other histological lesion of interest was very large numbers (up to 8 per medium power field) of sarcocysts in myocardial fibres, together with a mild, multifocal, non-suppurative myocarditis. This, together with the lack of any evidence consistent with the better-known viral or bacterial encephalitides, led to speculation that sarcocystosis was the cause of the CNS lesion, and that sufficient time had elapsed for much of the inflammatory change to have subsided. Any dissenting views would be welcome.

CNS lesions in bovine sarcocystosis are reported to be relatively minor compared with those in other organs. Nevertheless, severe granulomatous, necrotising meningoencephalitis attributed to sarcocystosis has been described in adult cattle (Dubey *et al.* 1987¹; Van der Lugt *et al.* 1994²). Typical *Sarcocystis* sp. meronts were observed in brain sections in these cases.

¹ Dubey JP, Perry A and Kennedy MJ (1987). Encephalitis caused by a *Sarcocystis*-like organism in a steer. *Journal of the American Veterinary Medical Association* 191: 231-232.

² Van der Lugt JJ, Markus MB, Kitching JP and Daly TJM (1994). Necrotic encephalitis as a manifestation of acute sarcocystosis in cattle. *Journal of the South African Veterinary Association* 65: 119-121.

Sporadic Bovine Encephalomyelitis

John Gibson, Toowoomba Veterinary Laboratory, Queensland DPI

Sporadic Bovine Encephalomyelitis (SBE) was diagnosed in a 12-day-old Angus calf born on a property at Dalveen. The calf was born uneventfully but was noticed to still be in the same location the following day. Closer examination by the owner revealed the calf had severe hindlimb paralysis, yet had motor control of its tail. The calf was hand reared for several days with no improvement in clinical signs. The calf was killed and presented for necropsy. The only change at necropsy was a slight excess of cerebrospinal fluid in the lumbar cord. CSF collected from this area was strongly positive for *Chlamydia* sp. by antigen detection ELISA. Sections of brain and spinal cord revealed a severe non-suppurative encephalomyelitis. The lesions were pronounced in the lumbar spinal cord and cauda equina. The lesion was characterised by vasculitis, focal gliosis and malacia with loss of motor neurons in the ventral grey matter horns of the lumbar cord. The sciatic and spinal nerves were also affected. The vasculitis involved lymphocytes, plasma cells and occasional neutrophils. The mild vasculitis and focal gliosis in the brain were confined to the posterior brain stem. The lesions were mainly the grey matter. There was moderate atrophy and myodegeneration of skeletal muscles of the hind limbs. There were no lesions in other tissues. Interestingly, the brains from two stillborn calves from this property also had similar histological lesions.

Alpha-mannosidosis in the guinea pig

J Finnie, Veterinary Services Division, IMVS Adelaide

Several guinea pigs from a colony had experienced ill-thrift from birth and, at necropsy at 6 months of age, were about 50% of their expected body weight and showed depression and gait abnormalities.

Microscopic examination of the brain revealed widespread neuronal vacuolation, best appreciated in 1 μ toluidine blue-stained plastic sections. The contents of the vacuoles were extremely water-soluble and failed to stain with PAS unless coated with celloidin (which only preserved a very small quantity of stored material). There were numerous axonal spheroids in some brain regions and frequently prominent pericyte vacuolation. Involvement was multisystem with epithelial vacuolation in thyroid, pancreas, renal tubules and epididymis being particular severe.

Biochemical analysis confirmed the diagnosis of alpha-mannosidosis and these appear to be the first reported cases of this lysosomal storage disease in guinea pigs. The model will be fully characterised in collaboration with the Department of Chemical Pathology, Adelaide Women's and Children's Hospital (Dr Alison Crawley) and may be used to evaluate therapeutic intervention strategies (e.g enzyme replacement therapy).

Alpha-mannosidosis is an inherited (autosomal recessive) lysosomal storage (mannose-rich oligosaccharides and glucosamine) disorder manifested principally by progressive neurological deterioration since long-lived, postmitotic cells such as neurons permit substantial substrate accumulation. This condition has previously been reported in man, cattle and cats and as a naturally occurring disease following ingestion of plants containing the potent lysosomal alpha-mannosidase inhibitor, swainsonine (biochemically distinct from the inherited condition as this alkaloid also inhibits Golgi mannosidase II).

Respiratory herpesvirus infection in an Indian Ringneck parakeet

Ruth Reuter, VPS/VETLAB, PIRSA, Adelaide

A 3-year-old male Indian Ringneck parakeet exhibited a short course (<24 hours) of depression, difficulty in perching and ataxia before found lying on the aviary floor in extremis. The bird was one of four (2 pairs) which had been in a new aviary on the property for 3-4 months. There was no evidence of vomiting and diarrhoea, and the other three birds appeared clinically normal.

On post mortem, the main changes were splenomegaly with white foci throughout, pale liver and congestion of the lungs. On histopathology the lungs were congested and oedematous with large numbers of amphophilic intranuclear inclusion bodies in the epithelium of the airways. Multinucleated giant cells were identified in alveoli in some locations. Similar inclusion bodies were identified in the nuclei of the hepatocytes. Other organs showed primarily congestion. A diagnosis of herpesvirus infection was made on morphology. Electron microscopy was not done in this case.

Acute respiratory disease associated with herpesvirus has been previously reported in psittacines including Bourke's parrots and Indian Ringneck parakeets in North America and New Zealand. This condition differs from Pacheco's parrot disease, which is systemic in nature with widespread distribution of lesions and different viral characteristics. A similar case was reported to the Australian Society of Avian Veterinarians by Jenny Clarke of VPS Sydney at their conference in Dubbo in 1996. Other cases of the disease have been reported recently from Western Australia.

Cutaneous angiomatosis in dairy cattle

Ruth Reuter, VPS/VETLAB, PIRSA, Adelaide

An 8-year-old Friesian dairy cow exhibited numerous dark red spots on the skin of the udder, most prominent in the dorsal region near the abdominal attachment. The lesions did not appear to be irritating the animal. However, the somatic cell count in the milk had increased over a period of time. Other animals were also beginning to show similar signs and the owner became concerned over his own health since he had small lesions on his hands and arms which he felt were similar to those in the cattle.

Multiple 0.4cm punch biopsies were submitted in formalin from the original affected cow. On microscopic examination, all of the sections showed similar changes. There were collections of dilated vascular channels in the superficial dermis which were lined by well differentiated endothelial cells and separated by dense connective tissue. Occasional groups of eosinophils were present in the area. The muscular walls of several large vessels appeared hypertrophic.

The lesions seen appeared to fit the description of cutaneous angiomatosis which was reported some years ago in dairy cattle overseas. In these animals, the skin of the back was primarily affected as opposed to the lesions here which were consistently on the udder.

To date we have only received samples from the one cow and have not had any further information on whether the owner has consulted a medical practitioner. The pressure and operation of the milking machine was apparently normal and no unusual disinfectant washes or sprays were being used. Comments from others who might have seen such cases would be welcomed.

Stinkwort induced enterotoxaemia

Marc Kabay, Animal Health Laboratories, Agriculture WA

The association between ingestion of stinkwort (*Inula graveolens*) and development of enterotoxaemia, is well known. However, veterinarians new to rural practice may not be familiar with this condition.

In this outbreak, deaths (35/350) were recorded in a mob of mixed sex weaner Merinos in an oat stubble paddock containing a small patch of stinkwort. The owner ceased feeding hay when substantial germination and regrowth of oats occurred and deaths commenced soon after. The sheep were not vaccinated.

Affected animals were comatose, had no menace reflex, and green diarrhoea. Several others in the mob were also scouring.

Necropsy findings on one animal were unremarkable. However, the small intestine was slightly thickened and contained short dark spicules closely adherent to the mucosal surface. The spicules were thought to be stinkwort bristles as the tips of almost every plant in a nearby patch of stinkwort had been cropped.

Microscopic examination of brain showed focal malacia, axonal swelling, vascular haemorrhage and protein leakage from vessels of the brain stem and cerebellar peduncles. These changes are consistent with enterotoxaemia. Plant spicules were present in the mucosal surface of the small intestine associated with adherent colonies of bacteria.

Ingestion of stinkwort bristles is thought to cause atony of the small intestine that results in overgrowth of *Clostridia perfringens*, production of epsilon toxin and enterotoxaemia. In this outbreak, withdrawal of hay may have caused a roughage deficit in the diet. No more deaths were recorded after the sheep were moved out of the paddock.

Pyrrolizidine Alkaloid Toxicity in Horses

Cleve Main, Animal Health Laboratories, Agriculture WA

Necropsy and subsequent laboratory examination of a 5 year old stock horse with a nervous disorder revealed multifocal purulent meningitis with reported apparent abscessation in the base of the left hemisphere (not examined histopathologically). There were no significant bacterial isolates.

An incidental finding was that of mild hepatocytomegaly with individual hepatocyte necrosis evident in some places. Elevated GGT values were found in serum samples from that and several other stock horses on the station.

Two weeks later another of the horses, a two year old filly was euthanased following deterioration in its condition. Subsequent histopathological examination revealed areas of hepatocytomegaly and subacute to chronic dissecting fibrosis with pseudo-lobulation and areas of severe bile ductile hyperplasia.

Crotalaria spp have not been found on the station and suspicion has fallen on *Trichodesma zeylanicum* (camel bush) which is widely distributed in the area. The plant has been reported to contain pyrrolizidine alkaloids³ but there have been no known reports linking it with deaths of livestock.

Investigations are proceeding.

Annual Ryegrass Toxicity (ARGT) in Cattle

Cleve Main, Animal Health Laboratories, Agriculture WA

44 out of 130 beef cattle died on a property in the southwest of the State. Deaths began just prior to the week ended 24 April and continued for the next 3 to 4 weeks. Steers and pregnant cows, but no calves, died.

The property was well outside the known ARGT belt and it was initially thought that Acacia being grazed as a fodder shrub may have been responsible. No significant lesions were found during histopathological examination of the brains and other organs from 2 cattle, but it was found during the subsequent investigation that annual ryegrass hay was also being fed. Classical clinical signs of ARGT were seen in several of the remaining cattle on the property. Rumen content from two animals tested by ELISA were strongly positive for Clavibacter antigen.

This is the second time within several years that ARGT has been diagnosed outside the known ARGT area. On both occasions it was brought about because the owners had purchased seed from known infected areas and fed the resulting crop as hay to their animals. It follows that sale of hay from those properties to local farms may have seen the disease spread further.

³ Bull LB, Culvenor CC and Dict AT (1968). The Pyrrolizidine Alkaloids. North Holland Publishing Company, Amsterdam.

Swan Mortalities - Cause Unknown

Cleve Main, Animal Health Laboratories, Agriculture WA

Over 30 swans residing on a southwestern lake system have died during the last 3 weeks. Local rangers and local government officers were unable to locate sick birds and only one dead bird was submitted for necropsy. This bird was partially decomposed, but more suitable for examination than others they had collected.

Post mortem examination revealed marked atrophy of the pectoral muscles, with a complete absence of body fat reserves. No food was present in the gastrointestinal tract, although some rectal content was present. A sponge-like thickening of the wall of the proventriculus was evident.

Samples of blood from another swan, rectal content and washings from the gizzard and proventriculus of the necropsied swan were tested by bioassay for Clostridial toxin. All but the assay prepared from rectal content were negative, but that also proved lethal to mice protected against C and D toxins. Interpretation of the result is open to speculation.

Macroscopic and histopathological examination of the proventriculus found that nearly every gland was parasitised by the nematode *Tetremeres* sp. (probably *fissispina*). The intermediate host are *Daphnea* sp. and other crustacean. The role of the parasite in this case is unclear as they have been found in large numbers in healthy wild ducks and geese without causing ill-effects. In this case, with malnutrition evident, the host parasite balance may have been upset.

“Canine Laryngeal Oncocytoma”

Mandy O'Hara, Murdoch University, WA

A 4 year old female Golden Retriever was presented to the Murdoch University Veterinary Hospital with a 6 month history of panting, harsh breath sounds and a change in her bark. Examination of the larynx identified an approximately 5cm mass arising from the right arytenoid region, deforming the larynx and protruding into and obstructing the lumen of the larynx. Multiple core biopsies were submitted for histopathology.

Changes within the biopsies were similar. The mass was composed of a neoplastic sheet-like proliferation of large brightly eosinophilic cuboidal cells partially divided into lobules by a delicate connective tissue stroma. Mature striated muscles were trapped within the proliferative mass and there was evidence along the tumour margin of infiltration between adjacent striated muscle fibres. The proliferating epithelioid cells demonstrated marked anisocytosis with a low nuclear to cytoplasmic ratio. Cytoplasmic invagination into the nucleus causing 'nuclear inclusions' were a prominent feature. Intercellular bridges were clearly evident uniting the neoplastic cells. Mitoses were not observed.

Cytologically, the cell morphology was consistent with an Oncocytoma, however these tumours do not normally demonstrate an infiltrative pattern of growth. Differential diagnosis of primary tumours in this site include squamous cell carcinoma, adenocarcinoma, chondrosarcoma, rhabdomyosarcoma melanoma and mast cell tumour (Moulton JE 1990) (1)⁴.

Based on the cytological appearance, histological pattern of growth and presenting history an oncocytoma and rhabdomyoma were considered the most likely differentials. An absence of elongate fusiform cells with cross striations and the presence of intercellular bridges made oncocytoma the most likely diagnosis, however electron microscopy and immunohistochemical staining would assist differentiation.

Despite a reported benign progression, the severe distortion of the larynx by the tumour would have necessitated laryngectomy and permanent tracheostomy which was refused by the owner and the dog was euthanased.

Oncocytomas are thought to be of neuroendocrine cell origin and are rare tumours at a site uncommonly affected by neoplasia (Jubb et al 1993)⁵.

Blindness in Ravens

Shane Raidal, Murdoch University, Perth WA

Two blind Australian ravens were submitted for necropsy examination. The birds had been in the care of a rehabilitation centre for 2 to 3 months and were representative of other cases seen by the centre and other wildlife carers in the Perth Metropolitan region.

Clinical examination revealed loss of normal hippus and pupillary light reflexes and a moderately dilated pupil. Ophthalmological examination revealed slightly cloudy posterior chamber and mild hyperaemia of the base of the pecten. One bird had pox-like nodules on several toes. Otherwise, the birds were clinically and neurologically normal and could hear and localise sounds. They vocalised in response to calls from other ravens.

Necropsy examination demonstrated several tapeworms in the intestine of one bird and a small firm abscess in the lateral abdominal wall near the cranial pole of the left kidney.

In both birds there were significant histological lesions in the eyes and brain. In the brain there was marked multifocal and perivascular infiltration of both grey and white matter with lymphocytes and plasma cells and diffuse mild Wallerian degeneration of optic nerve tracts. In the eye there was a mild diffuse lymphoplasmacytic infiltration into the choroids and pecten and marked retinal degeneration. There was protein effusion into the vitreous. Histological examination also demonstrated scattered coccidian shizonts in the foregut of both birds.

⁴ Moulton JE (1990). "Tumours in Domestic Animals" 3rd Ed. University of California Press, USA

⁵ Jubb KVF et al (1993) "Pathology of Domestic Animals" Vol. 2, 4th Ed. Academic Press Inc, USA

Diagnosis: Chronic lymphoplasmacytic encephalitis, optic neuritis and chorioretinitis. An aetiology not yet determined, although toxoplasmosis is high on the list of differential diagnoses. We have brain stored at -80 °C if anyone is interested in the agent.

Muscular hypertrophy of the ileum in a standard bred horse

Clive Huxtable, Murdoch University, Perth WA

The background to this case is that muscle hypertrophy of the terminal ileum and distal oesophagus are well recognized idiopathic changes in the horse, of doubtful clinical significance. A 9-year-old standard bred horse has had a several month's history of recurrent and worsening colic. At exploratory laparotomy, a segment of the small intestine from the distal duodenum to the distal jejunum was thickened and had reddish serosal plaques. No physical obstructing lesion could be found distal to this segment.

A full thickness biopsy revealed marked hypertrophy of the muscle coats, (especially the circular coat), oedema of the submucosa with a moderate diffuse eosinophil infiltrate, and dense infiltration of the lamina propria with lymphoid and plasma cells and few eos. The serosal surface had a plaque of vascular granulation tissue containing haemosiderophages, consistent with haemomelasma ilei.

There are thus many changes consistent with reaction to larval strongyles, but the change of interest is the associated muscle hypertrophy, and the findings in this horse appear to fit a clinico-pathologic entity which is being reported in the UK and USA. For a report from the US, see Chaffin *et al. Equine Vet J* (1992) 24: 372.

Rhodococcus pneumonia and Eimeria leuckarti infection in a foal

David Forshaw, Agriculture WA, Albany

A foal with a history of ill thrift and chronic diarrhoea was sacrificed in an effort to get to the bottom of a herd problem of diarrhoea in young horses.

At necropsy, the foal had soft but not watery faeces. In the distal ileum, individual villi appeared opaque giving the mucosa a very light finely stippled pattern. Multiple thick walled abscesses to 10cm diameter occupied approximately 20% of the caudal lung lobes. A thick walled abscess approximately 15cm diameter obliterated a bronchial node and was confluent with a consolidated area of lung.

Histologically, numerous villi in the ileum contained massively enlarged giant cells in the lamina propria which themselves contained coccidial forms. Mostly this was a basophilic material with a peripheral rim of host cytoplasm. The nuclei of these cells are greatly enlarged and wedged as a crescent between the coccidium and the peripheral cell membrane. Occasionally there are smaller bodies with larger eosinophilic granules and others with an intensely eosinophilic membranous structure which is shrunken away from the internal surface of the cell cytoplasm.

Rhodococcus equi was cultured from the lung lesions. The coccidian in the ileum fit the description of *Eimeria leuckarti*. Although providing a spectacular histologic picture, this coccidium is probably not pathogenic and the cause of the diarrhoea in this herd remains undetermined.

Opening of the new Berrimah Veterinary Laboratories – 15 April 1998

Anton Janmaat, Berrimah Veterinary Laboratories, NT Department of Primary Industry and Fisheries

Since the 1980's, the Berrimah Veterinary Laboratories (BVL) have been housed in three buildings. The Pathology laboratories in one, Bacteriology in a demountable and Virology in the AL Rose building – built in 1979 in response to the discovery of bluetongue virus at Beatrice Hill.

The initial plan was to build a laboratory complex housing all sections of BVL. When this turned out to be too expensive, it was decided to attach the new building to the existing AL Rose building and refurbish the latter. The new complex, all of it now called the AL Rose building, was officially opened on 15 April. There were invited guests from South-East Asian countries and China, and local and interstate representatives. The interstate guests included members of the AAHL Advisory Council, Veterinary Committee, SCAHLS, Cattle Council of Australia and Livestock Exporters.

The new building has an animal house, post mortem room, specimen reception area and a histology, large bacteriology (we have acquired water microbiology from another agency), parasitology, haematology, clinical chemistry, serology and molecular biology laboratories. There is a microscope room, an electron microscopy (EM) suite (without an EM), dark room, storeroom, scullery and media preparation room, instrument room, walk-in cold room and a walk-in freezer. Staff facilities consist of a conference room, kitchen and offices.

The refurbishment of the original AL Rose building is due to commence shortly. The cost of the new building and AL Rose refurbishment is said to be \$3.5 million and we were given \$500,000 for new equipment, computers and furniture.

Tuberculosis – the National Granuloma Submission Program works

Helen Parkes and Anton Janmaat, Berrimah Veterinary Laboratories, NT Department of Primary Industry and Fisheries

The first diagnosis of tuberculosis this year concerned lymph node lesions from a number 1 (branded 1991) cow. The gross diagnosis by the Katherine abattoir inspector, who submitted the nodes under the National Granuloma Submission Program, was a confident tuberculosis. Two retropharyngeal, two bronchial and one mediastinal lymph nodes were submitted and all showed lesions histopathologically consistent with tuberculosis. In three nodes (2 x retropharyngeal and mediastinal), the lesions looked old and inactive. In one of the bronchial nodes, the picture was similar except two areas the size of a HP field, where there was "fresh" caseation with a macrophage response and at least 10 acid-fast bacilli. The lesion in the other bronchial node was a typical, active tubercle with small foci of necrosis and neutrophils in the epithelioid layer next to the caseous centre – two AFBs were seen (we usually stop searching after two).

The cow came from a Top End station where TB was diagnosed in 1991, in a cow ex-Queensland in a re-stock cow herd. The current case then became part of a segregated heifer group. This group and other segregated groups were TB tested to confirmed free status in 1994, after which they were mixed. Another cow from the 1991 cow herd showed TB at slaughter in 1994 and a cow from another cow herd showed TB at slaughter in 1995. Since the 1994 and 1995 breakdowns, 6000 old cows have been slaughtered without evidence of TB. The last 1500 head of old cows will now be slaughtered. If the original segregated heifer group was indeed segregated at all times, the current case would have become infected in 1991, with an apparent recrudescence much more recently. It seems a bit far-fetched but who knows?

Oesophagostomum columbianum (and others) in young goats

Helen Parkes, Berrimah Veterinary Laboratories, NT Department of Primary Industry and Fisheries

Keeping goats in the tropics without using anthelmintics is asking for trouble, but breeders still need reminding. We have recently seen four 2-3 month old goats with (apparently) sudden deaths, all of which had extensive caseous nodular lesions, consistent with *Oesophagostomum columbianum* larvae, in the wall of the caecum and colon, and burdens of up to 100 adults in the large intestine. Approximately 5000 adult *Cooperia* sp. were found in a wash of the small intestine of one kid, and up to 30,000 coccidian oocysts per gram of faeces, identified as mainly *Eimeria christensenii*, with some *E. arloingi*.

Mixed bacterial infection of the CSF in a dog

Helen Parkes, Berrimah Veterinary Laboratories, NT Department of Primary Industry and Fisheries

A smear of CSF sample from a 12 month old male dachshund with acute onset of fever and severe neurological signs, including repeated seizures, showed a heavy mixed bacterial infection, including Gram-positive cocci, mixed Gram-negative rods and a Gram-negative spirochaete-like organism. Subsequent culture gave a moderate growth of *Pasteurella multocida*, a moderate growth of *Streptococcus* sp. and heavy growth of mixed anaerobes. The question remains how all these bacteria entered the CSF. Our best guess is a bite from an animal with very long, sharp teeth (cat?, reptile?) that happened to penetrate to the spinal canal. On questioning, the submitting veterinarian said there were marks on the neck and a slight swelling which she thought was fresh, but the owner felt had been there for several days or more.

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