Neosporosis in a dairy herd - Riversdale

Introduction

A Neospora caninum infection was diagnosed in a group of dairy cattle that aborted in the Riversdale area.

N. caninum is a coccidian parasite that can infect several species. Despite its similarity to Toxoplasma, Neospora infection has not been clearly associated with any human disease. Dogs (and probably also wild canids) are definitive hosts of N. caninum and are capable of shedding oocysts in faeces a few days after eating tissues of infected animals. The oocysts have an impervious shell that enables survival in soil and water for prolonged periods and can be a source of infection for many other host species including cattle.

Transmission

Neospora can infect cattle by two main routes: dog to cattle and cow to calf during pregnancy. Dog to cattle transmission occurs when cattle ingest Neospora oocysts in contaminated feed, water or from pasture. As a result, animals may become infected simultaneously, which can lead to abortion storms, where many cattle lose their foetuses within a short period. Cow to calf transmission may occur by two separate routes:

1) when the parasite from a previous infection, is reactivated in the cow during pregnancy
2) if the cow is newly infected with Neospora during pregnancy.

In both cases the unborn calves may become infected in utero. If the foetus survives the infection they are born congenitally infected but may appear clinically normal. Infected heifers can transmit Neospora to their offspring in subsequent pregnancies. This transmission route is very effective and Neospora may be maintained within a herd for many generations without the involvement of a definitive host.

Clinical presentation

Abortion is the only clinical sign observed in adult cows and can occur from three months of gestation to term, but most commonly at five to six months of gestation.

In dogs, subclinical infection is the rule, although there is a greater variety of exceptions. Litters or individual puppies may develop hind limb paresis that develops progressively into paralysis but the neurological signs are dependent on the site parasitized in the central nervous system. Adult dogs may have encephalomyelitis, focal cutaneous nodules or ulcers, pneumonia, peritonitis, or myocarditis.

In the Riversdale case approximately 80 first lactation Jersey heifers were moved from grazing camps to a veld camp that is located next to an informal settlement with many stray dogs. More or less three weeks after their introduction, a total of 11 heifers aborted in less than a week. All the heifers were approximately in their seventh month of gestation. A private vet was consulted and he took samples of nine heifers to tests for BVD, IBR, various leptospirosis species, brucellosis and neosporosis. Seven out of the nine samples tested positive for Neospora caninum on an antibody ELISA test, confirming the cause of the abortions. All other tests were negative, except for one heifer that, in addition to the neosporosis, also tested positive to IBR on antigen ELISA.

The private vet advised the manager to move all the heifers out of the veld to limit further exposure and no more abortions were observed, but unfortunately this does not guarantee that the rest of the heifers were not infected. There are no Neospora vaccines available in South Africa and testing and slaughter is the only available option to try and rid the herd from infection. The 11 heifers that aborted are kept separate from the other heifers in the group and will be removed from the herd. Since it is too expensive to follow a test and slaughter approach in this case, it was decided (on advice from KZN vets that regularly deal with Neospora abortions) to remove all cows that abort from the herd in future. In addition, other management procedures like the control of dogs (using dog-proof fences) and the correct disposal of placentas and aborted foetuses will also be followed.

References

http://www.knowledgescotland.org/briefings.php?id=288
Coetzer et al 2004 Infectious diseases of livestock, 2nd Ed, Vol 1: 382-393
Dr Albert van Zyl (Private Vet), personal communication.
African horse sickness update

Last month we reported on a suspect African horse sickness outbreak in the Melkbosstrand area of the Western Cape Province. The results from the second round of surveillance within the primary control zone were received and no further cases were detected. In fact, the only AHS positive result on real-time PCR was a case that had already been considered a vaccine reactor, and again the ct value of the PCR result was in line with the expected high ct values obtained in recently vaccinated horses.

While we cannot be sure of the cause of the positive events (vaccine strain RNA, vaccine strain circulation or a wild strain AHS outbreak) the Western Cape Veterinary services made use of the following reasons to lift the quarantine restrictions placed on the eight properties in the control area.

- No clinical signs of disease that could be solely linked to AHS were detected during the incident. There were clinical signs of disease but they were associated with a feed issue on one property.
- The 16 unvaccinated animals in the containment zone (of a total of 81) have not been affected at all - clinically or on testing
- Follow-up testing show no spread of infection
- 30 days had elapsed since the last positive cases were identified
- The weather patterns in the primary containment were not conducive to the spread of AHSV at the time of lifting quarantine

All restrictions to horse movement in and around the primary containment zone were lifted on 3 July 2013.

The editors take this opportunity to thank the owners of horses who were involved in the suspect outbreak in the Melkbosstrand region for their cooperation in maintaining the control measures implemented by the state. Without this cooperation the control of serious diseases like African horse sickness would not be possible.

Low pathogenic avian influenza outbreak update

In the April 2013 Epidemiology Report the main article was a description of the low pathogenic avian influenza H7N1 outbreak on two closely associated farms in the Oudtshoorn region. In that case the N type of the virus was established by evaluating the HI serological titres and prevalence seen during testing as well as a suspect positive N1 type PCR result on one positive AI tracheal swab pool.

In the May 2013 Epidemiology Report it was briefly mentioned that a further two farms had been identified in the Oudtshoorn region with positive H7 avian influenza results.

There have been some developments since then as a further three ostrich farms were identified as being infected with H7 avian influenza in the same region during June. Positive virus isolation results were obtained from five of the now seven farms affected and sequencing and N specific PCR data from four of these isolates indicate that an H7N7 virus is circulating. All seven farms have been now re-classified as H7N7 avian influenza infections.

Please refer to Figure 1: This shows a spatial distribution of the affected properties and their current testing status in terms of virus isolation, PCR and serology. The virus isolation has been a big assistance in understanding the outbreak thus far and helping in its classification as sequencing and N specific PCR has been performed using the allantoic fluid product. This is in contrast to the 2011 HPAI outbreak where very few isolates of virus were made.

Rift Valley fever ruled out of caprine mortalities

Two suspect cases of Rift Valley fever were identified on post mortem by the Stellenbosch Provincial Vet lab. The animals were milk goats on a zero grazing set-up in a well established commercial flock. One other animal died acutely soon after the initial deaths. Rift Valley Fever was an immediate differential diagnosis based on the pathology but samples tested on PCR at OVI returned negative results. A definitive diagnosis on this case was not made. We thank Dr Sophette Gers for the information on this event.
Introduction

The epidemiology section was approached by colleagues in export control services and by private veterinarians representing pork-exporting compartments and processors to assist in drawing up a surveillance plan to show freedom of *Trichinella* parasites in pork products destined for export. The need for this surveillance program was based on the import requirements set out by the Namibian Veterinary Authority and the relevant paragraph is:

*The carcases from which the pork originates: *-originating from an area free of Trichinellosis OR *-were examined and found free from trichinae, OR *-the pork has been subjected to a temperature not exceeding minus 25°C (-25°C) for a continuous period of not less than 30 days.*

The surveillance plan aims to allow compliance with this requirement in terms of the first option regarding Trichinellosis (*originating from an area free of Trichinellosis*) and is focused on declaring pig compartments free of the disease based on serial surveillance.

Trichinellosis is not one of the notifiable or controlled animal diseases in South Africa. It is a disease caused by the parasite *Trichinella spp.* Transmission is exclusively meat borne so humans get infected by eating raw or undercooked pork, horse or game containing infective *Trichinella larva* (Pozio 2007). No cases of trichinosis in humans have been reported in South Africa to date (Mukaratirwa, La Grange & Pfukenyi 2013). To the best of our knowledge the same holds true for domestic pigs in South Africa, although *Trichinella* has been identified in a number of wildlife species within the Republic (La Grange, Govender & Mukaratirwa 2013; Marucci *et al.* 2009; Mukaratirwa *et al.* 2013; Pozio 2007).

Type of surveillance

The surveillance method chosen is an active risk based surveillance with testing of carcasses slaughtered at an abattoir from specific pig compartments. The risk groups identified are based on the groups used by Alban *et al.* (Alban *et al.* 2011)

<table>
<thead>
<tr>
<th>Species risk group</th>
<th>Sampling Period</th>
<th>Proposed sampling frame</th>
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</thead>
<tbody>
<tr>
<td>Fattening pigs from controlled housing</td>
<td>June 2013</td>
<td>Every animal slaughtered per compartment applying for freedom</td>
</tr>
<tr>
<td></td>
<td>Quarterly</td>
<td>One week’s slaughter total per compartment applying for freedom with a minimum of 100 carcasses sampled</td>
</tr>
<tr>
<td>All sows and boars slaughtered at the abattoir</td>
<td>Throughout year</td>
<td>Every animal to be sampled</td>
</tr>
</tbody>
</table>

To get an initial indication of the occurrence of *Trichinella* on the initial two compartments which want to supply pork to Namibia from the Western Cape, a requirement that every finisher pig slaughtered during the month of June 2013 be tested for *Trichinella* was requested and results are pending. Based on the test results thereof we will consider then moving to a quarterly surveillance on the finisher pigs. In this case an entire week’s slaughter total per compartment will be tested. A minimum of 100 pigs will be included so if the week designated does not allow 100 pigs to be sampled the surveillance period per compartment must be extended to reach a minimum of 100 carcasses sampled. If the 100 pig minimum is reached within one week then sampling must continue for that entire week, irrespective of the number of animals sampled – so the maximum number of pigs sampled per compartment is only limited by the abattoir production schedule. All boars and sows slaughtered at the abattoir throughout the year will also need to be tested. The laboratory test used will be the pooled sample digestion method for *Trichinella* testing based on recommendations in European Community Regulation No. 2075/2005.

The current compartments under review fall under SAPQAT (South African Pork Quality and Traceability Standards) audits, and the success of the surveillance program relies on this. Compliance with this standard will significantly decrease the risk of Trichinellosis occurring on one of these compartments as a result of two major control measures –

a) no swill is fed on these properties so pigs will not complete the life cycle of the *Trichinella* parasite by eating pig, game or...
Pilot Trichinella surveillance program for the export of Pork cont.

horse meat infected with larvae and
b) rodent control is carried out on the properties.

The other reason why we believe a risk based surveillance is appropriate is that there has been no reported Trichinellosis in humans or domestic pigs in South Africa (to the best of our knowledge) – it must however said that the formal surveillance for this disease has been scant – the only formal surveillance we have managed to find evidence of was performed in 1944 (Monnig 1944).

References


Disease outbreak events

Colitis of unknown origin in horses - Dr. Sewellyn Davey, State Vet Malmesbury

A private vet was called to a livery in the Malmesbury district after seven out of 50 horses went off their feed on a Monday morning. By Wednesday there were five more horses affected. All were depressed and lethargic with increased gastrointestinal sounds. This was followed by constipation and then an explosive diarrhoea. One horse was euthanased on the Wednesday and Dr Stroebel of the Provincial veterinary lab (PVL) was asked to do a post mortem examination. From post mortem lesions he suspected a Salmonella infection as the causative organism. Eventually 17 horses were affected and five of these were hospitalized for treatment. One of these horses was euthanased at the hospital. The livery was advised to try and disinfect the entire premises and also improve biosecurity at the holding. Vircon S was used to disinfect stables, equipment and paddocks. After this effort there were no more cases. Salmonella was not cultured from the euthanased horse or three others showing severe diarrhoea. E.coli was cultured but not classified, but nowhere in literature is E.coli described as a cause of colitis in adult horses.

Listeria monocytogenes in goats - Dr. Sewellyn Davey, State Vet Malmesbury

A small-scale farmer from Saldanha lost 13 of his 210 goats over a period of two weeks. One carcass was submitted to the PVL where Listeria monocytogenes was isolated from the brain. Listeria is often associated with poor quality silage, but these goats do not have access to silage. When discussing the outbreak with a British colleague, he mentioned that in the UK they see a lot of Listeria cases after animals have eaten thistles. The thorns penetrate the buccal mucosa and allow the bacteria access to the underlying tissue including the trigeminal nerve, and thus a pathway to the brain. There are thorn bushes on the tract of land where the goats graze that could possibly have led to this case. It is however not known if this case was an isolated case or if the other goats that died, also died of Listeria, as no symptoms were ever seen and the goats were just found dead in the morning.
Figure 1: Disease outbreaks in the Western Cape Province identified during June 2013

Map produced by Animal Disease Control Unit, Department of Agriculture, Republic of South Africa.

Legend (Outbreaks in bold, follow up transparent):
- Avian Influenza
- Low Pathogenic Other
- Bacillus ovis infection (Orine spiroptera)
- Canine Babesiosis
- Equine Encephalitis Virus (EEV)
- Johne’s Disease (Paratuberculosis)
- Salmonella enteritidis
- Other Farm visits by officials
- Other Vaccination Events - All diseases
- Rabies
- West Nile Fever

Outbreak Map

Western Cape Province

Reported animal diseases for June 2013
Other Outbreak Events

- Numerous cases of equine encephalosis virus occurred in horses along the West coast between Atlantis and Darling and in Ceres. Two of these cases were colts with colitis (see earlier report) and another was an aborted foetus. Two horses in Melkbosstrand were also positive for West Nile virus on PCR testing, but showed no clinical signs of disease.

- A farmer from Vredendal was driving to Riebeeck-Kasteel when he noticed a paralysed bat-eared fox lying in the road. He stopped to pick it up and took it to a private vet in Piketberg, who immediately euthanased the animal while wearing protective clothing. The fox subsequently tested positive for rabies.

- Johne’s disease was confirmed on a sheep farm near Swellendam.

- Boot swabs from a broiler house near Malmesbury tested positive for Salmonella enteritidis. The chickens occupying the house at the time had already been slaughtered and the house disinfected and rested.

- Brucella ovis infection was found in a ram near Mossel Bay.

- Meatmaster ewes near Malmesbury showed signs of lethargy and rumen fluid was observed flowing from their nostrils. One of the ewes was slaughtered and a diagnosis of pulmonary adenomatosis (jaagsiekte) was made on macro- and histopathology.

- Two boergoat rams in a herd near Vanrhynsdorp showed severe clinical signs of pasteurellosis. This herd had been bought from a farm where pasteurellosis occurs.

- A diagnosis of canine babesiosis was confirmed in a dog in Murraysburg after a blood smear was examined.

Web based event logging AHT leader boards

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Disclaimer: This report is published on a monthly basis for the purpose of providing up-to-date information regarding epidemiology of animal diseases in the Western Cape Province. Much of the information is therefore preliminary and should not be cited/utilised for publication.