



Control of Equine Diseases

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Biosecurity

- *Biosecurity* means doing everything you can to reduce the chances of an infectious disease being carried onto your farm by people, animals, equipment or vehicles, either accidentally or on purpose
- A simple practical biosecurity programme can be introduced at very little cost and with little disruption to normal activities



- Good husbandry practiced on a day to day basis is the most effective way to reduce the spread of diseases
- Horses should be checked daily to ensure they are healthy and not at risk of injury
- Worming and vaccination programmes should be implemented and records for each horse should be maintained
- Keeping vermin and insects under control is also important in preventing the spread of disease
- Steps to deter insects and vermin can include having the manure pit emptied regularly, having feed in vermin-proof containers, disposal of old and uneaten feed and limiting spots for vermin to hide and breed





- Keeping equipment and tack well cleaned and washing and rinsing of feed and stable water buckets daily is also recommended
- Water troughs in paddocks should be cleaned weekly
- Wash and disinfect any equipment that has come into contact with the horse





Contagious Equine Metritis (CEM)

- Transport
- Shuttle stallions



Venereal pathogens

- *Taylorella equigenitalis* (notifiable)
- *Pseudomonas aeruginosa*
- *Klebsiella pneumoniae*



Pseudomonas aeruginosa

- All strains are potentially venereal



Klebsiella pneumoniae

- Capsular types 1, 2 and 5 are venereal
- All other capsular types are non-venereal
- Capsular type 7 is associated with metritis



Clinical manifestations of CEM

Mares

- Vaginal discharge from 2 days post service
- Infertility
- Early abortion
- Carrier status

Stallions

- Do not show clinical signs
- Organism becomes part of normal flora



Endometritis

Aerobes and Facultative Anaerobes

- Beta-haemolytic Streptococci
- Staphylococci
- E. coli
- Proteus sp.
- Klebsiella pneumoniae
- Alpha-haemolytic Streptococci
- Actinomyces pyogenes
- Enterobacter sp.



Endometrial smears

- Presence of neutrophils and / or bacteria

Uterine lavage

- Cytology
- Culture





- A PCR test provides a specific and highly sensitive tool for the rapid diagnostic method for contagious equine metritis (CEM)





Strangles

- Strangles is the common term used to describe the disease that affects horses, donkeys and mules



Strangles - History

- Giordano Ruffo - describes "Strangulina", in *De Medicina Equorum* written between 1251 and 1256
- Albertus Magnus – a Dominican Bishop describes "chronic sore throat" ^{between} in *De Animalibus*, written between 1258 and 1262 (*Slater 2003*)



(W.M. Bayly)



Strangles - Transmission

- Infected nasal secretions
- Lymph node discharges
- Staff
- Fomites – buckets, tack, horse vans, stables, etc.





- The incubation period is for longer than previously reported
- Nasal shedding of Strep. equi usually begins after a latent period of 4-14 days
- Established outbreaks may last for months





- Foals under 4 months are usually protected by colostral antibodies
- Some horses are carriers of Strep. equi for indefinite periods



Control of outbreak

- Seek veterinary advice
- Isolate infected animals
- Quarantine period to give time to detect shedding
- Three negative nasopharyngeal swabs
- Vaccination
- Detection of carriers
- Good animal husbandry and disinfection
- Disinfection procedures



Treatment

- Antibiotics (Penicillin, Ceftiofur, Sulphonamides, Fluids and NSAID's)
- Vaccination
- Let infection resolve itself (lance and drain)
- Flushing the guttural pouch
- Continual monitoring
- 'Bastard' strangles
- Purpura haemorrhagica



Strangles – control of transmission during outbreaks

- Disinfect
- Hygiene – clothing, footwear and equipment
- Dedicated staff
- Monitor the apparently asymptomatic





Rhodococcus equi

- First reported by Magnusson in 1923
- Also known as 'rattles'
- Previously called Corynebacterium equi
- Can be fatal
- Only single cases in Ireland until the 1980's
- 1989 – first reports in Ireland of outbreaks





Forms of R. equi

- Pneumonic form
- Mesenteric form
- Osteomyelitis, soft tissue
- Eye



R. equi characteristics

- Predominates in warm climates
- Survival in the soil
- Resistant to UV rays of the sun
- Resistant to disinfectants
- Endemic on farms





Clinical signs

- Can affect foals as early as one month of age
- Dull coat
- High temperature (up to 106°F)
- High WBC
- High platelets / microcytes
- Good appetite
- Lung sounds





Treatment

- Early diagnosis is important
- Antibiotic therapy (very costly) – Erythromycin / Azithromycin, Rifampin
- Hyperimmune plasms
- Vaccine



Means and ranges of the MIC concentration of *Rhodococcus equi* to Rifampin & Erythromycin for each year ($\mu\text{g/ml}$)

Year of Sample (No. of samples tested)	Rifampin (range)	Erythromycin (range)
2014 (4)	0.300 (0.19-0.38)	0.657 (0.38-1.00)
2013 (10)	0.345 (0.19-0.75)	0.800 (0.75-1.50)
2012 (10)	0.308 (0.125-0.50)	0.439 (0.25-0.75)
2011 (10)	0.408 (0.19-0.75)	0.514 (0.38-0.75)
2010 (10)	0.325 (0.125-0.50)	0.775 (0.50-1.00)
2009 (10)	0.689 (0.25-2.00)	1.125 (0.50-3.00)
2008 (10)	1.025 (0.50-1.50)	0.115 (0.047-0.19)
2007 (10)	0.489 (0.125-1.50)	1.225 (0.50-2.00)
2006 (12)	0.187 (0.12-1.00)	0.583 (0.50-0.75)
2005 (10)	0.181 (0.12-0.64)	0.496 (0.25-0.75)
2004 (10)	0.142 (0.12-0.25)	0.333 (0.25-0.50)
2003 (10)	0.137 (0.03-0.25)	0.348 (0.25-0.50)
2002 (11)	0.132 (0.03-0.25)	0.400 (0.25-0.38)
2001 (11)	0.125 (0.12-0.12)	0.265 (0.12-0.38)
2000 (10)	0.114 (0.04-0.19)	0.233 (0.19-0.38)
Pre-2000 (20)	0.081 (0.03-0.12)	0.258 (0.12-0.38)



- Inevitable resistance occurring in *Rhodococcus equi* to Rifampin and Erythromycin and that, in the future, these antibiotics may be less effective in the treatment of foal pneumonia caused by *Rhodococcus equi*





Parasites

Strategic Worming Programme

- Use of correct wormer to treat each specific parasite
- Treat horses at correct time of year
- Use each wormer at the right time interval
- Rotates wormer by different types of compound





Combatting resistance

- Frequent monitoring of egg counts
- Administer products at proper dosage
- Treat all newly arrived horses
- Conduct egg reduction tests
- Rotate anthelmintics annually





- Management factors contribute to resistance
- Pastes are equally effective as other forms of treatment





Moulds and mycotoxins in equine management

- Viral
- Bacterial
- Parasite
- Fungal





- Poor performance
- COPD / RAO
- EIPH





- Aspergillus
- Penicillium
- Fusarium





Mycotoxin

- A secondary metabolite produced by a living filamentous fungus which is toxic to horses when absorbed ingested or inhaled



The telltale adverse effects of various mycotoxins acting individually or in combination

- Decreased feed intake, production
- Immunosuppression (decreased antibody titre values)
- Increased susceptibility to diseases
- Damage to organs (liver, kidney, reproductive organs, etc.)
- Poor reproductive performance (decreased fertility, vulvovaginitis, repeat breeders, abortion, udder enlargement, etc.)



Feed samples

- Hay / haylage
- Feed in bags
- Mixed feed
- Mixing containers



Stables

- Air hygiene monitoring
- Surface swabs
- Bedding
- Cobwebs



Animals

- Blood samples
- Bronchoalveolar lavage





Observations

- Check ventilation
- Moisture
- Use of antibiotics
- Feed and feed house
- Bad management practices





- Wetting or damping of hay
- Baling of hay
- Storage of hay
- Climatic conditions





Which is the best bedding?

- Straw
- Shavings
- Paper
- Synthetics



Causes of enteritis in horses & foals

- Environmental
- Drug induced
- Viral
- Bacterial
- Parasitic
- Allergies
- Neoplasia
- Granulomatous enteritis



Environmental

- Mare in season – foal develops enteritis
- Lush pasture
- Feed (milk)

Drug induced

- Use of antibiotics that affect gut flora
- Large doses of antibiotics that are excreted via the bile





Viral

- Rotavirus – affects foals
- Secondary bacterial infection





Bacterial

- E. coli
- Salmonella
- Rhodococcus equi
- Colitis X
- Clostridium perfringens
- Campylobacter
- Cryptosporidium





Parasitic

- Massive strongyle larval migration
- Cryptosporidium





Allergies

- Due to components in feed



Neoplasia

- Tumour in the gut

Granulomatous enteritis

- Due to tissue strongylosis
- External factors (environmental)

