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 Medicine Equorum* written between 1251 and 1256

- Albertus Magnus – a Dominican Bishop describes “chronic sequelae” 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 (µg/ml)

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