

Brief summary



Factors affecting the occurrence of *Rhodococcus equi* (Rattles) in the environment of foals

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A summary of RIRDC publication no 06/097, Rattles in Horses, Effects of stud management on ecology of virulent Rhodococcus equi, by Gary Muscatello, James Gilkerson and Glenn Browning.

Background

Rhodococcus Equi

- Commonly referred to as “Rattles”.
- Important cause of pneumonia in young foals and ranked as among the four most important disease problems of the horse industry.
- Prevalence of disease appears to be increasing in all breeds throughout the world.
- In Australia generally 1 – 10% of foals are affected and although mortalities are usually maintained below 1% by early aggressive therapy, on some studs mortalities of 20% or higher occur in some years.
- Excreted in largest numbers by foals aged between 4 and 12 weeks.
- Estimated to cost industry \$2 - 4 million annually.
- Only *R. equi* carrying a specific plasmid (virulent *R. equi*) can cause disease in foals.

Epidemiology

- A soil organism, multiplies particularly well under temperate spring and summer conditions in soils contaminated with manure.
- Commonly found in the faeces and intestines of a variety of animals, and actively multiplies in the intestine of foals up to the age of 12 weeks.
- Aerosol infection as a result of inhalation of faecally contaminated dust is thought to be the major route of infection in foals.
- Disease occurs endemically on many studs and sporadically on others, there is also variation in the severity of disease. Whatever the disease pattern on individual studs, most horses are exposed to the organism. The reason for variation in patterns of disease is likely to be partially due to environment (with infection loads varying between studs depending upon amounts of faecal contamination and airborne dust) as well as conditions for amplification of bacterial numbers in surface soil. There is also strain variation in virulence.

Factors affecting prevalence of *R. equi*

Ecology

- A greater prevalence of *R. equi* is reported in **sand, sandy loam or loamy sand soils** compared to clay, clay loam or sandy clay loam soils.
- *R. equi* prevalence is also likely to be influenced by:
 - The concentration of **horse faeces** in the soil;
 - **Ambient temperature** (growth is best at **30°C**, reduced at 20°C and no growth at 10°C).
- In an Australian study, virulent *R. equi* was found to be higher in soil and air from the **pens and lanes** than in soil and air from the paddocks. The holding pens and lanes had drier soil than the paddocks on most farms. The sandy soil in the pens and lanes and lack of grass cover probably contributed to drier soil conditions. *Preliminary studies have shown that irrigation of these areas may reduce airborne concentrations of virulent *R. equi*.*

- Virulent airborne *R. equi* is more prevalent:
 - In the middle and late in the season compared to early in the season;
 - In paddocks with a **low pasture height** (<10cm).
- While dust may be a source of infection, it seems likely that most infections later in the season are a result of transmission directly from one foal to another. Control of disease might be most effectively achieved by **reducing the number of times foals are mustered into large groups, reducing the amount of time they are kept together in close proximity and reducing the size of the groups**, thus reducing exposure to subclinically infected foals.

Foal Numbers on farm

- A low prevalence of *R. equi* pneumonia (<3%) has been found to be associated with a small (<70) foal population;
- Similarly, the occurrence of mortalities due to *R. equi* pneumonia has been associated with **medium** (70-210 foals) or **large** (>210) **foal populations**.

Vaccination use on farms

- **An Australian study found that farms that vaccinated against EHV-1 and EHV-4 were significantly more likely to have a low prevalence of *R. equi* pneumonia.** However there was also a correlation between farms with small foal populations and farms that vaccinate against EHV-1 and EHV-4 which may explain the association between vaccination strategy and low disease prevalence.

Anthelmintic use on farms

- **Farms that administered anthelmintics to mares in the last month of pregnancy were more likely to report *R. equi* associated mortalities than farms that did not administer anthelmintics to mares within one month of foaling.** This association may be related to the effect of stresses caused by mustering and administration of a substance late in gestation on the quality of colostrum produced by the mare, and hence on the level of passive immunity against *R. equi* acquired by foals.

Foal conformational problems

- **A significant association was observed between the prevalence of conformational problems and mortalities due to *R. equi* pneumonia.** It is common practice to confine foals with limb conformational problems in small yards to facilitate assessment and correction of the fault. These yards are usually devoid of pasture cover and thus are dry and dusty environments. Extended stays in such areas may result in a greater risk of inhalation of high concentrations of virulent *R. equi* and subsequent severe bronchopneumonia.

Suggested management strategies:

- Environmental conditions such as dry dusty soils and poor pasture cover appear to favour virulent *R. equi* in the environment. Management strategies that affect these environmental variables are likely to influence disease prevalence on a farm:
 - Preliminary studies indicate that irrigation of holding pens may have a significant impact on the concentration of virulent *R. equi*;
 - Reducing the time foals spend in close proximity in pens and reducing the size of foal groups may also reduce spread of infection.