Actinobacillus

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General Characteristics

- *Actinobacillus* species
  - non-motile,
  - non-spore forming,
  - Gram-negative rods
- Sometimes coccobacillary in appearance.
- Facultative anaerobes
- Ferment carbohydrates producing acid but not gas.
- Most species are urease- and oxidase-positive.
Usual habitat

- Actinobacilli are commensals on mucous membranes
  - upper respiratory tract
  - oral cavity
- cannot survive for long in the environment,
- carrier animals play a major role in transmission
- Actinobacilli exhibit some host specificity
- mainly pathogens of farm animals.
Growth and reactions on MacConkey agar

- *A. lignieresii*, *A. equuli* and *A. suis* grow well on MacConkey agar.

- Colonies of *A. lignieresii* are initially pale turning pink after 48 hours.

- *A. equuli* and *A. suis* ferment lactose, producing pink colonies.

- *A. pleuropneumoniae* and *A. seminis* do not grow on MacConkey agar
# Important pathogens

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Actinobacillosis- Wooden tongue

- *Actinobacillus lignieresii* - is a commensal of the oral cavity and the intestinal tract.

- Enter tissues through erosions or lacerations in the mucosa and skin.

- A chronic pyogranulomatous inflammation of soft tissues

- Induration of the tongue, referred to as timber tongue.

- Also affects *oesophageal groove and the retropharyngeal lymph nodes*
Actinobacillosis- Wooden tongue

• Difficulty in eating and drool saliva

• Esophageal groove can lead to intermittent tympany

• Enlargement of the retropharyngeal lymph nodes can cause difficulty in swallowing

• Lesions may be found on the head, thorax, flanks and upper limbs.
Treatment and Control

- Sodium iodide parenterally or potassium iodide orally
- Potentiated sulphonamides or a combination of penicillin and streptomycin
- Oral isoniazid for 30 days for refractory lesions.
- Rough feed or pasture should be avoided.
Sleepy foal disease

• Sleepy foal disease is an acute, potentially fatal septicaemia of newborn foals

• Caused by *Actinobacillus Equuli*

• May cause abortion, septicaemia and peritonitis, in adult horses

• The organism is found in the reproductive and intestinal tracts of mares.

• Foals can be infected in *utero* and *after birth via the umbilicus*. 
Sleepy foal disease

• Affected foals are febrile and recumbent. Death usually occurs in 1 to 2 days.

• Recovered Foals develop polyarthritis, nephritis, enteritis or pneumonia.

• Foals dying within 24 hours of birth have petechiation on serosal surfaces and enteritis.

• Meningoencephalitis can be detectable histologically

• Foals which survive for 1 to 3 days have typical pin-point suppurative foci in the kidneys.
Treatment and Control

• Unless the disease is detected early, antimicrobial therapy is of little benefit.

• The organism is usually susceptible to streptomycin, tetracyclines and ampicillin.

• Supportive treatment includes blood transfusion and bottle-feeding with colostrum.

• Mares which have had affected foals should be monitored closely at subsequent foalings.

• Prophylactic antibiotic therapy may be considered for newborn foals.
Pleuropneumonia of pigs

• Caused by *A. pleuropneumoniae*,
• Affect susceptible pigs of all ages.
• Worldwide occurrence
• highly contagious disease, *primarily in pigs under 6 months of age*,
• Incidence more in intensive rearing practices
Pathogenesis and pathogenicity

- Capsules antiphagocytic and immunogenic,
- Fimbriae and other adhesins
- Cytotoxins producing pores in cell membranes.
- Neutrophils -damaged and release lytic enzymes
Clinical signs and epidemiology

- **Subclinical carrier pigs**, -tonsillar tissues.
- Poor ventilation and sudden drops in ambient temperature
- Aerosol transmission occurs in confined groups.
- some pigs may be found dead and others show
  - **dyspnoea, pyrexia, anorexia and a disinclination to move. Blood-stained froth**
  - may be present around the nose and mouth, and many pigs show cyanosis.
Clinical signs and epidemiology

- Pregnant sows may abort.

- Morbidity rates can range from 30-50% and case fatality rates may reach 50%.

- *Pasteurella multocida* and Mycoplasmas

- At post-mortem areas of **consolidation and necrosis are found in the lungs** along with fibrinous pleurisy.

- **Blood-stained froth may be found in the trachea and bronchi.**
Treatment & Control

• As antibiotic resistance is encountered in some strains, chemotherapy should be based on the results of antibiotic susceptibility testing.

• Prophylactic administration of antibiotics to in-contact pigs may limit the severity of clinical disease.

• Polyvalent bacterins may induce protective immunity but fail to prevent transmission or the development of a carrier state.

• A subunit vaccine containing toxoids of the three *A. pleuropneumoniae* toxins and capsular antigen has been developed (Valks *et al.*, 1996).
Actinobacillus suis infection of piglets

- *Actinobacillus suis* may be present in the *upper respiratory tract of sows*.

- Piglets *become infected by aerosols or possibly through skin abrasions*.

- The infection occurs mainly in young pigs under 3 months of age.

- The disease is characterized by septicaemia and rapid death.

- Mortality may be up to 50% in some litters.
**Actinobacillus suis** infection of piglets

- Clinical signs include:
  - fever,
  - respiratory distress,
  - prostration and paddling of the forelimbs

- Petechial and ecchymotic haemorrhages occur in many organs, interstitial pneumonia, pleuritis, meningo-encephalitis, myocarditis and arthritis

- An unusual form of the infection in mature pigs - skin lesions resembling those of **swine erysipelas**
THANKS