Diseases of the Central Nervous System
What you will learn in this session:

- What diseases manifest with nervous signs exist in pigs in Australia.
- How they impact on the health, welfare & performance of the pigs & the herd.
- How to diagnose them.
- How to treat them.
- How to minimise their impact on-farm.
What “diseases” are we talking about?

- Hypoglycemia
- Streptococcus suis
- Haemophilus parasuis
- Oedema disease
- Salt poisoning
What is their impact?

- Nervous signs are relatively rare
- Paddling, inco-ordination, lethargy
- Usually occur as part of a complex of clinical signs
- Acute cases may respond to parenteral antibiotics and antiinflammatories (Flunixin)
What are the events surrounding the case?

- **How old is the pig(s)?**
  - Hypogycemia in suckers
  - Others in weaners

- **Are there other clinical signs?**
  - Scouring with oedema disease
  - Arthritis, illthrift, sudden death with H. para & S. suis

- **Is there a history of water deprivation?**
  - Salt poisoning
Strep. suis

- 35+ serotypes
- Serotype 2 most common in pigs
- Transmitted vertically early & later horizontally as weaners
- Septicemia in pigs of all ages resulting in meningitis, polyarthritis, endocarditis, polyserositis, and/or pneumonia.
- Opportunistic pathogen of the lung secondary to infections with Mycoplasma hyopneumoniae in high health status pigs. Many of these pigs appear as the typical post weaning "poor doers" or "starveouts".
Streptococcus suis

- Common worldwide & relatively common in Australia.
- Has gained recent popularity as the bacterial pathogen able to evade medicated and segregated early weaning systems.
- It may occur sporadically, and affect 1-2 pigs in a group, or it may occur as epidemics (e.g., in early weaned herds of pigs).
- Opportunistic pathogen
- Zoonotic.
Haemophilus parasuis

- Glassers disease (revision)
- How is it transmitted?
- What are the gross PM signs?
- What samples do you collect?
- What tests do you ask for to confirm a diagnosis?
Oedema disease

- F18 fimbrial variant of *Escherichia coli* that produces SLT-I, i.e., a Shiga like toxin

- *Escherichia coli* colonize the small intestine and release the SLT-IIe toxin systemically which results in degenerative angiopathy
Oedema disease

- **Clinical signs:** Usually within 10 days of weaning; Sudden deaths of good looking pigs; Dull, blind, head pressing, incoordination and loss of balance, lateral recumbency, paddling, coma, death; Squeaky voice

- **Lesions:**
  - Gross lesions can include edema of face and eyelids (usually observed first), submucosa of stomach, gall bladder, spiral colon, lymph nodes, around kidneys, in the larynx, and lungs. Microscopic lesions observed in the brain can include fibrinoid necrosis of arteries and arterioles, edema, perivascular cuffing, occasional thromboses. Encephalomalacia and cyst formation can be observed.

- **Diagnosis:** Isolation and typing of *E. coli* and toxin
Oedema disease

• Treatment - anti-inflammatory, antibiotics
• Prevention - autogenous vaccination
Salt poisoning/Water deprivation

- Caused by XS dietary salt or sudden water deprivation.
- Overseas - salt poisoning in pot-bellied pigs fed dog food, pretzels or other salty foods.
- The condition is usually the result of water deprivation in pork production units when a water line is turned off and forgotten or when a waterer becomes blocked.
Salt poisoning/Water deprivation

- **Pathogenesis:**
  - Wrongly formulated diet or loss of water supply >> brain tissues dehydrate and sodium content increases - inhibits anaerobic glycolysis >> Water moves out of intracellular spaces due to the hyperosmolarity of the extracellular fluid.
  - Sudden rehydration may worsen condition.
Clinical signs are observed after water has been suddenly restored.

Peracute: prostration, running movements, coma and death

Acute (following restricted water intake): twitching, pruritis, thirst and constipation, blindness, circling, head pressing and inappetance follow 1-5 days later

Diagnosis: History and clinical findings, "Pathognomonic" lesion in brain - eosinophils around blood vessels, Salt levels in brain (0.18 to 0.19% DM)
Salt poisoning/Water deprivation

- **Treatment:** Re-introduce water supply gradually (Use a sprinkler), Supportive treatment of convulsions using sedation (eg SC Phenobarb); Restrict feed intake, Dexamethasone injections can be helpful if only a few pigs are affected, but are not practical if large numbers of pigs are affected.

- **Prevention:** Ensure adequate water supply; ensure pigs can use nipples before weaning into nursery with nipple drinkers; Provide free access clean water, especially if rations have a high content of salt.
What’s your diagnosis?

• 5 week old pigs weaned at 4 weeks of age into a “traditional” weaner shed.
• 4% post-weaning mortality
• Weaner growth rate (4-10 wks) = 320g/d
• Clinical signs - illthrift, arthritis, nervous signs, sudden death
• Fading pigs respond poorly to antibiotics
Quizz

- What are your DDx?
- What do you do on the day of the visit to treat the sick pigs?
- What do you do to confirm your diagnosis?
We know this may be:

* Glasser’s disease
  * Strep suis
  * Oedema disease
  * Salt poisoning
  * Something else?
Diagnosis of nervous signs in weaners

- Rule out water deprivation.
- What other clinical signs are apparent?
- If there is diarrhoea—take rectal swabs (what pigs will you take the swabs from?)
- Necropsy is vital (which pigs?, how many?)
- What gross lesions will you see?
What specimens will you collect and what will you ask the laboratory to do with them?
Culture & Sensitivity from brain swab yields Strep suis Type 2
What are our options to prevent Strep suis occurring in the future?

- Antibiotics?
- Vaccines?
- Environment?
- Management?
- Anything else?
Strep suis

- Check pigs at least 2 times daily.
- Isolate sick pigs to a recovery pen.
- Treat sick pigs with parenteral Amoxycillin + anti-inflammatory.
- Give supportive treatment where appropriate.
Strep suis

- Vaccines
  - Many have tried—many have failed!
  - Many serogroups a problem.
  - Need to be autogenous.
  - Zoonosis!
Strep suis

- Environmental issues—what are they?
A CASE STUDY

Strep suis - “Purple head disease” (PhD)

- the probable cause of sudden death at Gre Gre
Background to Gre Gre

- Weaner site
- 14-17-day old weaners....8 weeks
- AIAO by shed and site
- Commingled at weaning
- Bedded system
- 1000 pigs per shed
- 9 sheds per site (including 1 runt shed)
- Dogs (Jack & Gus) used to work the pigs
How important was it?

Cause of death (YTD):

- Sudden death 49%
- Destroyed 25%
- Scours 11%
What did we do about it?

- **<Wk 8, 2000:**
  - nothing

- **Wk8-17:**
  - 10mg/kg/d Amoxil Mon/Tues for 4 weeks
  - Sheds 1,3,7,9 (Seville, Huntly, St Arnaud 1)
  - cost 8.5c/pig

- **Wk17-:**
  - 20mg/kg/d (cost 17c/pig)
  - Wk 35: all sheds medicated
Issues

- Does medication reduce death?
- Is medication increasing age of death?
- Should we medicate all sheds?
- What else can we do?
- (Do Jack & Gus need a wage rise?)
1. Does medication reduce death?

Total sudden death in sheds 1, 3, 7, 9

Deaths/week

Week In

Amoxil
10mg/kg

Amoxil
20mg/kg
2. Is medication increasing age of death?

Percent sudden death in Wks 6, 7, 8

Percent "late" sudden deaths

Amoxicil 10mg/kg

Amoxicil 20mg/kg

Weeks In
3. Should we medicate all sheds?

- 63% of all sudden deaths occurred in Sheds 1, 3, 7 and 9 (the medicated sheds)
- Shed 5 (runt shed) contributed to 15% of sudden deaths
- Remaining 4 sheds contributed 21% (despite no medication)
Should we extend the period of medication?

- Does the medication work?
- What does it cost?
  - Amoxil @ 20mg/kg at 18 & 21kg = 16c/pig
- What are the other options?
  - Re-arranged the commingling? - deaths at Seville > Maysleith > Huntly > others
  - LA Penicillin at weaning? - won’t eliminate carrier state
  - Vaccinate? Breeders/Progeny
  - Improve the environment
Dear Paul (GM, Farming Operations),

Please can we please have a wage rise and personal indemnity insurance for barking at 130kg pigs??

From Jack and Gus

cc Dad (Craig Sandral)
What you should have learnt in this session:

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- How they impact on the health, welfare & performance of the pigs & the herd.
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