DISEASE DIAGNOSIS
What you will learn in this section:

- Best practice for undertaking necropsies in pigs.
- How to euthanase pigs safely and humanely.
- How monitoring pigs post-mortem during processing can be used to assist in health control programs on-farm.
- How to logically approach a diagnostic work-up.
Necropsies - equipment

- Sharp knife
- Steel & stone
- Forceps
- Scissors
- Gloves
- Jars/bags
- Swabs
Necropsies-best practice

- Do it away from live pigs
- Clean & disinfect equipment after
- Disinfect gloves before disposal
- Cut away from yourself
- Candidates:
  - recently dead or euthanase
  - representative of the problem
  - early in the course of disease
  - Not previously treated with antibiotics
## Euthanasia

<table>
<thead>
<tr>
<th></th>
<th>Nursing Piglet (&lt; 8 kg)</th>
<th>Nursery Pig (8-20kg)</th>
<th>Growers/Finishers</th>
<th>Sows/Boars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>Yes</td>
<td>Yes</td>
<td>Not practical</td>
<td>Not practical</td>
</tr>
<tr>
<td>Gunshot</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Captive Bolt</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Anesthetic OD</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Blunt trauma</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Logical approaches to a necropsy

Is organ/system normal?

Examine other organs/systems

YES

NO

Describe changes.
List possible causes.

Establish presence/absence of key diagnostic features of each possible cause.

Perform necessary additional tests

Make a diagnosis.
Identifying the anatomy
(note that this pig is jaundice)
What is normal?

Normal lung

Normal heart

Normal intestines
We don’t routinely post-mortem suckers. The external signs (below) usually tell you the cause of death.

<table>
<thead>
<tr>
<th>Main external finding</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piglet has not walked</td>
<td>Stillbirth</td>
</tr>
<tr>
<td>Piglet has sunken eyes</td>
<td>Dehydration/Scours</td>
</tr>
<tr>
<td>Piglet has obvious abnormality</td>
<td>Defect</td>
</tr>
<tr>
<td>Piglet has swollen joints</td>
<td>Arthritis</td>
</tr>
<tr>
<td>Piglet is in good condition</td>
<td>Overlay or acute disease</td>
</tr>
<tr>
<td>Piglet is less than 800g</td>
<td>Small/non-viable</td>
</tr>
<tr>
<td>Piglet with bite wounds</td>
<td>Trauma (gilt or other piglets)</td>
</tr>
<tr>
<td>Piglet is pale</td>
<td>Anemia</td>
</tr>
<tr>
<td>Piglet has abrasions on inner legs</td>
<td>Splayleg</td>
</tr>
<tr>
<td>Piglet is in poor condition</td>
<td>Chronic disease/starvation</td>
</tr>
</tbody>
</table>
Weaners in good condition found dead

- Red/Purple extremities? YES → Lungs with black/solid areas +/- pleurisy? YES → Pleuropneumonia (APP)
  - NO → Trauma

- NO → XS fluid and/or fibrin in abdomen, chest cavity & heart sac?
  - "Wet", heavy lungs? YES → GO TO NEXT PAGE
Weaners in good condition found dead

XS fluid and/or fibrin in abdomen, chest cavity & heart sac?
“Wet”, heavy lungs?

YES

Yellow lumps in heart valves?

YES
Streptococcal septicemia

NO

Dilated & fluid-filled intestines?

NO

Colibacillosis

YES

Does heart look purple?

YES
Mulberry heart

NO
Strep or Glassers

Culture
Grower/Finishers in good condition found dead

Purple extremities?  
- Yes
  - Lungs with black/solid areas +/- pleurisy?  
    - Yes
      - Pleuropneumonia (APP)
    - No
      - Bruising, no gastrointestinal signs  
        - Yes
          - Trauma
        - No
          - XS fluid and/or fibrin in abdomen, chest cavity & heart sac?  
            - Yes
              - "Wet", heavy lungs
            - No
              - Are there diamond-shaped skin lesions?  
                - Yes
                  - Erysipelas
                - No
                  - Go to next page

Go to next page
Grower/Finishers in good condition found dead

XS fluid and/or fibrin in abdomen, chest cavity & heart sac?
“Wet”, heavy lungs?

Yellow lumps in heart valves

Streptococcal septicemia

Strep or Glassers

Culture

Blood in stomach?

Stomach ulcer

Blood in SI?

Bruising?

GO TO NEXT PAGE
Grower/Finishers in good condition found dead

Blood in small intestine?

- YES
- NO

Is the SI wall thickened?

- YES
- NO

Blood/dead material in large intestine?

- YES
- NO

Dysentery

Unknown

Ileitis

Ileitis or intestinal accident

Unknown
What is your diagnosis?

- **Weaners**
  - Trauma
  - APP
  - Strep
  - Mulberry heart
  - Glassers
  - E coli

- **Growers/Finishers**
  - Trauma
  - APP
  - Strep
  - Mulberry heart
  - Glassers
  - E coli
  - Stomach ulcer/accident
  - Ileitis
  - Dysentery
  - Erysipelas
What you need for a further workup

- **Histology**
  - In jars or plastic bags
  - Send normal & abnormal tissues
  - Handle samples gently
  - Take samples about 1cm thick
  - Don’t freeze
What you need for a further workup

- **Culture**
  - Clean tissue in a jar or plastic bag
  - Need at least 3-4cm²
  - Swabs in transport media
  - Keep in the fridge (don’t freeze)
  - Send to the lab within 24h with an ice-pack
Health checks during processing

- Inspection of carcasses to monitor the presence & severity of production-limiting diseases
- Inspection results sent to producer
- Suitable health controls applied & effectiveness reviewed
- 4 recommended per year
What conditions are monitored?

- Dermatitis (mange)
- Bronchopneumonia (incidence & severity)
- Pleuropneumonia + pleurisy
- Roundworm
- Proliferative enteritis
- Nephritis
- Arthritis
- Peritonitis/pericarditis
Requested additions

- Atrophic rhinitis
- Sow infertility
- Oesophago-gastric ulceration
- Swine dysentery
Short-falls of abattoir monitoring

- Lag period
- Some lesions may heal before slaughter
- May miss low incidence lesions with low sample sizes (do at least 30)
Lung scores-bronchopneumonia

Total = 14/55
Grade 1 pleurisy + pericarditis
Dermatitis not caused by sarcoptic mange. This carcasse went through without being trimmed. These type of lesions can affect the majority of the skin area and may lead to extensive trim. Lesion is in the epidermis and could be removed if dehairing bath was hotter?
Skin damage-erysipelas
Bruised hocks
Proliferative enteritis
Q1. What are these?
Q2. Where do the adults live?
Q3. What lesions may you see in affected pigs?
Q4. What clinical effects might you see in affected pigs as a result of either the adults or the larvae?
Logical approach to a diagnostic workup

1. Get a complete history
   - How long has the problem been occurring?
   - Has it happened before?
   - Have they tried treating with anything?
Perform an on-farm clinical evaluation of the problem

- What are the clinical signs?
- What age pigs are affected?
- Is the nutritional program meeting the pigs' needs?
- What other disease problems are on the farm?
- What is the medication/vaccination program on the farm?
Analyze the production system

- Continuous flow
- All-In- All-Out
- Multiple site
- Age segregation
- Early weaning
- Commingling
Study the environment

- Is there enough space per pig?
- Do pigs have access to feed & water?
- Is the ventilation system adequate?
- Is it working?
Does the pattern of disease suggest infectious process?

- Is the spread within litters/pens/rooms/age groups?
- Does it appear to respond to antibiotic treatment? (most pig diseases in Australia are of bacterial origin)
Does the pattern of disease suggest infectious process?

- Can you recognize the disease from clinical signs?
- Does is co-incide with a change in management/environment/entry of new animals?
On farm necropsy

- Are there recently (hours old) dead cases to necropsy?
- Are there representative live cases to necropsy? (choose non-medicated, acute cases).
- Are there changes in body organs that appear abnormal?
On farm necropsy

- Collect representative samples of each.
- Also collect “routine” samples likely to harbour bacteria (liver, lung, spleen, kidney, lymph node). Target the organ you suspect to be affected (eg small intestine for scouring).
Necropsy-confirmative diagnostics

- Consider bacteriology first—it’s relatively inexpensive.
- Take samples also for histo—you can store them in formalyn and submit them later if your bacto is inconclusive.
Necropsy-confirmative diagnostics

- If bacto and histo are inconclusive, talk with a pig specialist and/or your diagnostic lab. It may be the samples you took were inappropriate or that you have a new/emerging disease!
Outbreak of diarrhoea on a 3000-sow piggery
Q1. What background data would you collect about the farm?

Q2. What questions would you ask about the outbreak?

Q3. How would you determine the cause of scouring?
Inflamed fluid filled spiral colon 12 week old pig U6
Haemorrhagic mucosa of spiral colon, 12 week old
Confirming the diagnosis

- Q4. What samples would you take to confirm your diagnosis & what tests might you ask for?
What you should have learnt in this section:

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