Stamping out procedures (domestic pigs)

Sixth meeting of the Standard Group of Experts on ASF in the Baltic and Eastern Europe Region
Vilnius, Lithuania – 28-29 November 2016

Jorgen M. Westergaard
OVERVIEW

• Definitions
• Disease confirmation
• Epidemiology
• Killing
• Carcass disposal
• Cleaning and disinfection
• Repopulation
• Conclusions
Definitions

• OIE HANDYSTATUS II - Stamping out(S): Slaughter of all sick and contaminated animals with destruction of their carcases (by burying, incineration, etc.) followed by cleansing and disinfection of the premises

• FAO - Stamping out: eradication procedures based on quarantine and slaughter of all infected animals and animals exposed to infection
Stamping-out policy:

The Veterinary Authority eliminates an outbreak by:

(a) Killing of animals
(b) Carcass disposal
(c) Cleansing and disinfection
African swine fever suspicion

• Disease investigation
• Submission of samples to laboratory
• Movement restriction
• Epidemiological enquiry
• Premises to be sealed off
Eliminate an African swine fever outbreak

• Killing of pigs
• Disposal of carcasses and products
• Cleansing and disinfection

Additional measures to Stamping-out

• Valuation of pigs
• Epidemiology and sample collection
• Disease reporting
• All pigs affected by African swine fever (ASF)
• Pigs suspected of being affected in the herd or in other herds which have been exposed to infection by direct animal to animal contact or by indirect contact likely to cause the transmission of ASF-virus
Epidemiological inquiry

Tracing

- TRACING BACK = origin of infection
- TRACING FORWARD = spread of infection
- To focus on:
  (INCUBATION PERIOD, OIE, nature 4 - 19 days; Sus Scrofa 15 days)
How shall pigs be killed?

Attention shall be paid to:

• Animal welfare
  - Animals shall be spared any avoidable pain, distress or suffering during their killing and related operations
• Stunning methods
• Killing methods
• Standard operating procedures
• Depopulation action plan
• Person with certificate of competence
# Pigs - Stunning methods

<table>
<thead>
<tr>
<th>Mechanical methods</th>
<th>Description</th>
<th>Key parameters include</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penetrative captive bolt device</td>
<td>Damage of brain</td>
<td>Position and direction of the shot</td>
</tr>
<tr>
<td>Firearm with free projectile</td>
<td>Damage of the brain</td>
<td>Position and direction of the shot</td>
</tr>
<tr>
<td><strong>Electrical methods</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A current generate a generalised epileptic form on:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head – only electrical stunning</td>
<td>The electro-encephalogram (EEG)</td>
<td>Minimum current and voltage</td>
</tr>
<tr>
<td>Head-to-Body electrical stunning</td>
<td>The EEG and fibrillation or stopping of the heart</td>
<td>Minimum current and voltage</td>
</tr>
</tbody>
</table>
Mechanical Stunning equipment
Mechanical stun

- Very good stun

Remember sinuses in large boars and sows
Electrical Stunning equipment
Electrical stunning

- Electrode positions during manual stunning
## Pigs – Stunning methods

<table>
<thead>
<tr>
<th>GAS</th>
<th>Description</th>
<th>Key parameters include</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide at high concentration</td>
<td>Anoxia</td>
<td>Gas quality and concentration, exposure time, temperature</td>
</tr>
<tr>
<td>Carbon dioxide in two phases</td>
<td>Anoxia</td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide associated with inert gas</td>
<td>Anoxia</td>
<td></td>
</tr>
<tr>
<td>Inert gas</td>
<td>Anoxia</td>
<td></td>
</tr>
<tr>
<td><strong>Other methods</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lethal injections</td>
<td>Loss of consciousness</td>
<td>Type of injection and medicine used</td>
</tr>
</tbody>
</table>
• Rate of induction of unconsciousness is related to concentration of gas
  – Low concentrations require long exposure times
• Duration of unconsciousness is related to gas concentration and duration of exposure
• Prolonged exposure to high concentrations result in irreversible stun
  – death in some animal
Injectable anesthetics include: Barbiturates; sodium pentabarbital
### Monitoring stunning

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td>No rhythmic breathing</td>
</tr>
<tr>
<td>Visual</td>
<td>Recumbency; carcass relaxed, jaw open and tongue hanging out</td>
</tr>
<tr>
<td>Visual</td>
<td>No voluntary movements</td>
</tr>
<tr>
<td>Physical</td>
<td>No corneal reflex when touching the eye</td>
</tr>
<tr>
<td>Physical</td>
<td>A pin prick in the nose or an ear pinch should not produce a reaction</td>
</tr>
</tbody>
</table>
• Pigs can only be killed after appropriate stunning (simple stunning)
• Simple stunning shall be followed as quickly as possible by a procedure ensuring death:
  • Bleeding
  • Pithing
  • Electrocution
  • Prolonged exposure to anoxia
Killing - Electrocution
Killing - Electrocution
Killing – Electrocution

• Entrance

• Entrance
Killing – Electrocution

• Exit

• Exit
Killing – Electrocution

- Killing of pigs during Classical swine fever epidemic
Gassing of pigs

- Pig container
- Pig container
Gassing of pigs

- Pig container
### Killing methods, Baltic States, 2015

<table>
<thead>
<tr>
<th>Country</th>
<th>Mechanical</th>
<th>Electrical</th>
<th>Gas</th>
<th>Lethal injections</th>
<th>Dead at time of confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia 18</td>
<td>1</td>
<td></td>
<td>12</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Latvia 10</td>
<td>9</td>
<td>1</td>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lithuania 13</td>
<td>2</td>
<td></td>
<td>10</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Country</td>
<td>No. Outbreaks</td>
<td>Depopulation date of confirmation</td>
<td>Depopulation date of Confirmation +1</td>
<td>Depopulation date of Confirmation +2</td>
<td>Depopulation date of Confirmation &gt; 2</td>
</tr>
<tr>
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<td>-------------------------------------</td>
</tr>
<tr>
<td>Estonia</td>
<td>18</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Latvia</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>13</td>
<td>8</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
- Methods of priority – Environmental protection

- Licensed Incineration
- Licensed Rendering
- Licensed Landfill
- Mobile on farm Air Curtain Burners
- On Farm Pyres & Burial
Carcass disposal

- Incinerators
Carcass disposal

• Leak proof truck

• Rendering plant
Carcass disposal

- Licensed landfill
Burial site, 5 meter deep and 3 meter wide

- 2 meter
- Soil to cover carcasses

- 2 meter
- Area for carcasses

- 1 meter
- Minimum distance to water level
Carcass disposal

BURNING

- Building a Pyre
  - Railway sleepers or Forestry Timber
- Straw
- Wood/kindling
- Coal
Carcass disposal/BURNING
Cleansing and Disinfection

- Preliminary disinfection
- Thorough cleaning
- Two final disinfections and degreasing one week apart
- Detailed guidelines Annex “ of Council directive 2002/60/EC

Disinfectants/Inactivations
- NaOH, 8/1000. 30 min.
- Hypochlorines – 2.3% clorine, 30 min.
- Formalin, 3/1000. 30 min.
- Ortho-phenylphenol – 3%, 30 min.
- Iodine compounds
- OIE Technical card
Vectors not implicated

- Repopulation may start 40 days after completion of cleansing and disinfection
- Repopulation procedures:
  (a) In open-air holding introduction of sentinel pigs; serological test after 45 days; if no antibodies full repopulation
  (b) In other holdings as (a) or all pigs enter within 20 days and undergo serological tests 45 days after arrival of last pig.
- No pigs leave a holding before negative results of serology
## Repopulation Baltic Countries 2015

<table>
<thead>
<tr>
<th>Country</th>
<th>NO. Of ASF outbreaks</th>
<th>Holdings repopulated (Nov.2016)</th>
<th>Partly repopulated</th>
<th>Full Repopulated</th>
<th>Months after Compelton of cleansing &amp; disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td>18</td>
<td>5</td>
<td>5</td>
<td></td>
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Baltic Countries, 2015

- Cleansing & disinfection
- Repopulation
- Result:
  - NO RECRUDESCENCE
For some infectious animal diseases there are currently no alternative control methods than the Stamping out policy.

A successful application of using Stamping out in domestic pigs calls for a good knowledge and resource with regard to:
- legal provisions
- Disease investigation and confirmation
- Biosecurity measures
- Epidemiology
- Killing methods (animal welfare + logistic operational)
- Carcass disposal
- Cleansing and disinfection
Thank you

Third meeting of the Standard Group of Experts on ASF in the Baltic and Eastern Europe Region
Moscow, Russia – 15-16 March 2016

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GF-TADs Secretariat