Experience With Risk Based Meat Inspection of Fattening Pigs in Germany

Lüppo Ellerbroek
Risk based procedures in food hygiene

Regulation (EC) No 854/2004: nature and range of inspection in premises depends on the result of risk assessment

EU Regulation (EC) No 882/2004: official controls in premises on the basis of a risk assessment

Risk based meat inspection

Risk based control of food business operators

Risk based sampling of food at retail level
Article 4 Reg (EC) No 854/2004:
the nature and intensity of auditing tasks … shall depend upon the assessed risk … the competent authority shall regularly assess:

(a) public risks and,
(b) where appropriate, animal health risks;
(b) in the case of slaughterhouses, animal welfare aspects;
(c) the type and throughput of the processes carried out; and
(d) the food business operator’s past record
Regulation (EC) No 854/2004 (EU hygiene package)

Annex I
Fresh meat
Section IV: specific requirements
Chapter IV: domestic swine
B. post-mortem inspection

2. The competent authority may decide, on the basis of epidemiological or other data from the holding, that fattening pigs housed under controlled housing conditions in integrated production systems since weaning need, in some or all of the cases … only undergo visual inspection.

controlled housing?
integrated production?
Reg. (EC) No 1244/2007 explains as follows:

(a) “controlled housing conditions and integrated production systems” means a type of animal husbandry where animals are kept under conditions in compliance with the following criteria:

a) Feed according to Regulation (EC) No 183/2005
b) All-in/all-out system
c) No access to outdoor facilities
d) Extensive information concerning animal / keeping conditions
e) Using bedding: disease prevention
f) Hygienic work conditions for staff
g) Control of access
h) Restrictions for tourists / camping
i) No access to garbage dumps or household garbage
j) Pest management
k) No silage as feed
l) No access to effluent and sediment from sewage treatment plants
Application of legal background: Guideline for authorisation:

**CRITERIA**

A. Food chain information concerning Reg (EC) No 853/2004

B. Reg (EC) No 1244/2007 ("controlled housing conditions and integrated production systems")

C. "additional intrinsic factors"
   1. Farm data recorded electronically and evaluated to be presented to the OV at meat inspection
   2. Logistic organisation of meat inspection by slaughterhouse operator
   3. Presentation of relevant information at the slaughterline
   4. Verification of findings (follow-up examination of chilled carcases)
   5. Personnel training (farmer, slaughterhouse staff, inspection personnel)
   6. Serological / microbiological monitoring of relevant health risks
Model to comply

Transfer of relevant data from farm and from slaughtered animals

- Livestock owner
- Data livestock
- Vet
- Shipping documents
- FCI
- Slaughterhouse operator
- Data meat inspection
- Traditional meat inspection
- OV
- Decision on vis. meat insp.
- CRITERIA A/B/C
„Cornerstones“ of visual meat inspection for fattening pigs

**Farm**
1. FCI
2. Integrated production system
3. Controlled housing condition

**Slaughterhouse**
4. Data terminals at slaughter line
5. Logistic arrangements for slaughter
6. Post-processing line in operation

**Competent authority**
7. Microbial/bacteriological monitoring in place
8. Verification of visual meat inspection
9. Verification of controlled housing conditions
10. Training of farmers, slaughterhouse staff and inspection personnel

Competent authority authorises start of „visual meat inspection“
Field trials – first results
Example 1:
Internet based animal registration list (1)

Name of the holding

ID number of the holding

Animals foreseen

“Historical” findings in the last 6 months

Time of arrival

Inspection mode: vis / trad

courtesy D. Meermeier
Example 1: Internet based animal registration list (2)
data file on „historical“ meat inspection findings

Selected findings per customer

<table>
<thead>
<tr>
<th>Block</th>
<th>Befunde von Tieren</th>
<th>Ist-Wert</th>
<th>Richtwert</th>
<th>Richtwert überschreitung</th>
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<td>17 : 1471</td>
<td>1,16%</td>
<td>2,00%</td>
<td>n</td>
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<tr>
<td>3 Leberbefunde</td>
<td>507 : 1471</td>
<td>34,47%</td>
<td>25,00%</td>
<td>j</td>
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<tr>
<td>4 Pleuritis</td>
<td>144 : 1471</td>
<td>9,79%</td>
<td>10,00%</td>
<td>n</td>
</tr>
<tr>
<td>5 Pneumonie</td>
<td>41 : 1471</td>
<td>2,79%</td>
<td>8,00%</td>
<td>n</td>
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<tr>
<td>6 Pericarditis</td>
<td>70 : 1471</td>
<td>4,78%</td>
<td>8,00%</td>
<td>n</td>
</tr>
</tbody>
</table>

Limit (%): above or below

Findings

damages by slaughter
findings at the liver
pleuritis
pneumonia
pericarditis

courtesy D. Meermeier
Example 1: internet based animal registration list (3) data file on „historical“ meat inspection findings

<table>
<thead>
<tr>
<th>findings</th>
<th>animals</th>
<th>found (%)</th>
<th>limit / threshold (%)</th>
<th>limit exceeded</th>
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</thead>
<tbody>
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<td>parts Mycobacteria found</td>
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<td>0,25</td>
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</table>

<table>
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<th>animals</th>
<th>found (%)</th>
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<th>limit exceeded</th>
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<td>0,07</td>
<td>0,25</td>
<td>no</td>
</tr>
</tbody>
</table>
Example 1:
Display terminal for (visual) meat inspection at slaughter line
Example 1:

growing acceptance for visual meat inspection procedures

courtesy J. Beuck
Example 1:

Results in meat inspection
n = 562,885 pigs

Findings in meat inspection

- liver
- pleuritis
- pneumonia
- pericarditis
- unfit
- M. avium spp

enhanced liver findings due to preselection of slaughter batches???

courtesy D. Meermeier
Example 1:

*Erysipelothix rhusiopathiae* (E.) symptoms found

<table>
<thead>
<tr>
<th>Year</th>
<th>slaughtered animals</th>
<th>E. total</th>
<th>lesons at joints</th>
<th>lesons at heart valve</th>
<th>lesons at skin</th>
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<td>2007</td>
<td>956,279</td>
<td>106</td>
<td>73</td>
<td>11</td>
<td>22</td>
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<tr>
<td>2006</td>
<td>861,890</td>
<td>73</td>
<td>59</td>
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<td>6</td>
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</tbody>
</table>

> findings of lesion at heart valve negligible concerning *Erysipelothix rhusiopathiae*
**Example 1:**

**Microbial inhibition test**  
(Three plate test, TPT)

<table>
<thead>
<tr>
<th>Year</th>
<th>slaughtered animals</th>
<th>random samples taken</th>
<th>samples taken in suspicion</th>
<th>results</th>
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<td></td>
<td></td>
<td></td>
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<td>861.890</td>
<td>5377</td>
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</table>

> findings of residues with TPT negligible

courtesy D. Meermeier
Example 1:
Further ongoing projects:

**multiserological monitoring with meat juice:**
Salmonella, Yersinia, Toxoplasma, *Mycoplasma hyopneumonia*

<table>
<thead>
<tr>
<th>Farm of origin (No)</th>
<th>Year</th>
<th>Salmonella (%)</th>
<th>Yersinia (%)</th>
<th>Toxoplasma (%)</th>
<th><em>Mycopl. hyopneumonia</em> (%)</th>
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<tr>
<td>4</td>
<td>2009</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>90</td>
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<tr>
<td>4</td>
<td>2010</td>
<td>80</td>
<td>0</td>
<td>20</td>
<td>60</td>
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</table>

Case study on farm level:
identify origin of entry
C&D
meat insp.
minimise cross-contam.
logistic slaughter

meat not fit for raw consumption?

Find reasons for low prevalence

courtesy Th. Blaha
Example 1:

Further ongoing projects:

Health index for farms of origin:
1) mortality of pigs (herd book)
2) fattening niveau (low / average / high)
3) level of medication

> 76 points

mentoring for better animal health

• 240 farms evaluated 2010
• average: 58 points
Build up a serological *M. avium* - profile

Sampling of batches for MAP (since 2008)
(MAP ELISA ID Lelystad/ Prionics)
[validation / approval of the test still pending]

Categorisation of farms:

*Neutrale*  
*Low*  

farms with positive findings:

*high* blood risk profile  
(enhanced sampling frequency)

approval for vis. meat inspection

trad. meat inspection

courtesy G. Klein
### Example 2:

**internet based animal registration list (1)**

#### blood risk profile (BRP)

<table>
<thead>
<tr>
<th>Schlagzeichen</th>
<th>BRP</th>
<th>zu ziehende Proben</th>
<th>k.H.</th>
<th>Hemmst.-Test</th>
<th>QS</th>
<th>vis. F.U.</th>
<th>TPT</th>
<th>VVVO-Nr.</th>
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</tbody>
</table>

#### Controlled housing condition

- BRP: Blood Risk Profile
- QS: Quality Status
- TPT: Test Procedure
- FHA: Further Handling Action
Example 2:
Serological investigation on *M. avium* (date 2009)

1187 farms sampled
787 farms classified

- no pos. titer for antibodies
- 41% farms with „neutral“ profile
- 49% farms with low profile

approval for vis. meat inspection

increased positive / high positive titer
2% farms

trad. meat inspection

further investigation

courtesy G. Klein
Example 2:

Tuberculinisation on farm in suspicious case

36 h after injection:

- swollen skin > 4 mm
- erythema
- central necrosis and exudation

courtesy G. Klein
Example 3: QA of meat inspection: towards uniform understanding of findings
Summary and perspective for risk based meat inspection

Pro´s:
Feasable in practice
Aims on targeted and risk based diagnostic procedures
„Advocates“ contact between slaughterhouse operator, farmer and inspection personnel to enhance both food safety and animal health to minimise risks in primary production

Con´s:
Reliable FCI?
More costs?
Farm conditions: integrated production and controlled housing: Who controls?

Needs:
Training – communication of all stakeholders
Benchmarking for public health, animal health and animal welfare
Acceptance of vis. meat insp. in the primary production
Data base for all participants
Which risks are relevant: Salmonella, Yersinia, M. avium, Toxoplasma gondii …. Microbial/serological/microarray methods to detect hazards associated with meat
Thank you for your attention

Lüppo Ellerbroek

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