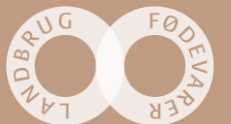


Modernisation of meat inspection - Status for Denmark

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About Denmark

National swine herd comprises of 12 M animals

- 6 M people – 2 pigs per person 😊
- 3,327 swine per herd on average
- Specialised production
 - Only 2.3% of herds have both pigs and cattle
- High breeding potential: 30.1 pigs per sow year
- 12 M piglets are exported
- 18.7 finisher pigs produced per year

Total production of pig meat is 1,954 M kg

- 88% exported to >100 countries around the world
- Corresponding to export value of € 3.8 B



*Dependency on export implies
a substantial need for
acceptance of equivalence to
obtain trade agreements*

To which extent has visual-only inspection been implemented in Denmark?

Visual-only inspection (VOI) is now fully implemented in pigs raised indoor

- Called controlled housing
- Handling is required, if serious lesions are present

In non-controlled pigs, traditional inspection (TMI) is still taking place

- Due to requirements from important trade partners
- Currently being discussed in Denmark whether VOI should replace TMI of non-controlled finishing pigs

Not meaningful to talk about VOI of sows and boars

- Presence of other lesions need to be dealt with



What is the experience, pros and cons?

Experience

- Necessary to gradually assess, evaluate and implement change in inspection

Pros

- Finishing pigs are generally healthy and require minimum handling during inspection
- Most lesions are macroscopically detectable

Cons

- Medium-sized abattoirs could not see the benefits (lowered costs of control)
 - Investments required e.g. to have “plucks over intestines”
 - But no benefits because of limited ability to cut down on staff
- Whereas small abattoirs saw more possibilities; they simply stopped using knife and kept manipulation to a minimum

Food Chain Information (FCI)

FCI is implemented and consists of

- Contact details, vet, etc.
- Salmonella status of herd
 - Electronic identification – directly from Salmonella database
 - Level-3 animals go to sanitary slaughter such as hot-water decontamination
- No symptoms of disease in herd at date of delivery
- Indoor-/outdoor (controlled/non-controlled housing)
 - Auditing by independent 3rd party at regular intervals
- Sworn agreement regarding compliance with withdrawal periods after antimicrobial treatment

Recorded electronically into central database

- Medium/small abattoirs: Also possible to register via paper



Reaction from trade partners to change of meat inspection

Negotiation regarding acceptance of equivalence from important trade partners

Three risk assessments undertaken to study effect of change of inspection in finishing pigs:

1. Not palpating mandibular lymph nodes and not opening heart routinely
2. Not palpating intestinal lymph nodes routinely
3. Not palpating lungs routinely

Conclusion

- In general VOI can replace TMI
- Presence of severe abnormalities results in extended examination of carcass in rework area



Reaction from consumers and workers' union

There has been no reaction from consumers

Initially, there was a negative reaction from vets and official auxiliaries

- Dealt with by dialogue
- Concern: Job security/change of culture difficult to understand
 - We could have done better
- Expressed concern: Can we find what we need to find with VOI?
 - Addressed in detail by risk assessments



More work was needed to fully illustrate effect of change

Not palpating
lungs routinely

- Embolia could be overlooked, if small and few
- Lungs not considered edible tissue

Impact on
meat safety?

- Negligible impact, because bacteria seldomly present in meat and bacteria are not meat-borne

Deboning
carcasses with
septicaemia
lesions ?

- Not required for chronic cases, because abscesses will be found and negligible risk related to overlooking abscess

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The food safety value of de-boning finishing pig carcasses with lesions indicative of prior septicaemia

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ABSTRACT

The primary purpose of meat inspection is to protect the public health by ensuring that only safe meat for human consumption enters the market. EU Regulation 854/2004 specifies that a generalised condition should result in the condemnation of the carcass. However, a generalised condition concerning carcasses with lesions indicative of a prior septicaemia is not specified. Carcasses are de-boned to avoid the presence of abscesses in the muscles. This study evaluated the food safety value of this specific use of de-boning. Retrospective data from meat inspection lesion codes for all finishing pigs slaughtered, at the abattoirs were obtained from the Danish Slaughterhouse Database. These data showed large differences in how often abscesses were found at de-boning ($P < 0.001$). Less than 1% of the carcasses were totally condemned after de-boning. The presence of bacteria in the muscle samples was compared to control muscle samples ($P = 0.86$). Based on the bacteriological findings related to meat from de-boned carcasses and meat from unconditionally condemned carcasses, de-boning was not considered to be a sufficient inspection procedure to ensure food safety. Instead, thorough inspection (including predilection sites for the abscesses) in the rework area could replace de-boning in the rework area, such abscesses would probably be found during cutting of the carcasses in the rework area, also processing, should therefore be sufficient.

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Research & Development

Evaluation of the food safety risk associated with de-boning of Danish sows

Investigations on sows with chronic purulent lesions indicative of prior septicaemia

By Tanja Østergaard Pedersen, Anne Kristine Bækbo, Jesper Valentin Petersen, Marianne Halberg Larsen and Lis Alban

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Assessment of human health risk associated with pyaemia in Danish finisher pigs when conducting visual-only inspection of the lungs

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ABSTRACT

The most important lesion to be overlooked when performing visual-only inspection of the lungs is embolic pneumonia. The aim of the present study was to assess the additional human health risk represented by overlooking cases of pyaemia represented by embolic pneumonia in finisher pigs, when conducting visual-only compared to palpation of the lungs, as is the traditional meat inspection procedure. An examination of bacteria isolated from 19 finisher pigs identified with embolic pneumonia at traditional meat inspection was undertaken. From each pig samples were taken from various organs (lungs, spleen, heart, liver and kidney), from the carpal joints (*A. carpi*) and flexor muscle (*M. flexor digitorum superficialis*) on the right foreleg. These data were included in a risk assessment following OIE guidelines. Bacteria were isolated from 78 out of 127 tissue and swab samples taken (61% positive samples). *Staphylococcus aureus* ($N = 37$) was the most frequently isolated bacterium. The predominant site of *S. aureus* was the lung. *S. aureus* was detected although less frequently in low numbers in some organs (<100 CFU/sample) and muscle samples (<10 CFU/sample). Only one MRSA isolate was found. *Staphylococcus warneri* ($N = 24$) was the second most commonly found bacterium. There was no predominant site and the number of *S. warneri* was less than 50 CFU per sample. The risk of a food-borne intoxication from *S. aureus* in relation to pyaemia in pigs was considered very low due to the low quantitative numbers of *S. aureus* in muscle tissue samples. Implementing visual-only inspection will reduce the exposure of *S. aureus* due to less cross-contamination and handling of the plucks by the meat inspectors. The human health risk associated with *S. warneri* was considered very low, due to the limited zoonotic potential of this bacterium. In conclusion, the additional human health risk in relation to possibly overlooking pyaemia in Danish finisher pigs was considered negligible when conducting visual-only compared to traditional meat inspection.

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KEYWORDS

- De-boning
- Sows
- Septicaemia
- Meat inspection
- Staphylococcus aureus*

Meat inspection is performed including incisions into the dermal, backbone, ribs, ham, and shoulder. This is either the lesions reflect an acute or prior infection. In the acute case is totally condemned, whereas in the chronic case, characterised by encapsulated abscesses in the organs (spleen) and here most often located in the lungs (embolic pneumonia) and here most often located in the lungs (embolic pneumonia) and here most often located in the lungs (embolic pneumonia). In Denmark, carcasses with embolic pneumonia are officially required to be sent for de-boning (Larsen et al., 2016). The purpose of de-boning is to remove abscesses of osteomyelitis, which has not been found in meat can be accepted, if an acute infection can be confirmed. Meat is used for sausage production and put on the market (Larsen et al., 2015, personal communication).

Trichinella – EU legislation

EU Regulation 2075/2005 allowed Member States to apply for negligible risk status for *Trichinella* in domestic swine population

- Only Denmark and Belgium obtained this status
 - Possibility to recognise individual holdings not used in EU



EU Regulation 2015/1375: Negligible risk status can be obtained for compartment but not for region or area

- Requirement: Herds should have high biosecurity = controlled housing conditions
 - Specified in Annex to EU Regulation 2015/1375
 - Testing for *Trichinella* not required for pigs from controlled housing herds
- Danish and Belgian herds with controlled housing => negligible risk compartments
 - Denmark: Testing is still done for carcasses delivered to export-oriented abattoirs

Trichinella – OIE Code

Described how to establish compartment with negligible risk of Trichinella infection in domestic pigs kept under controlled management conditions

Prerequisite criteria (Article 8.16.4)

1. Trichinella infection notifiable **YES in animals/meat - reported in humans**
2. Vet Authority has knowledge of, and authority over, all domestic pigs **YES**
3. Vet Authority has current knowledge of distribution of susceptible species of wildlife **YES**
4. Animal identification and animal traceability system for domestic pigs in place **YES**
5. Veterinary Services have capability to assess epidemiological situation, detect presence of Trichinella infection (including genotype, if relevant) in domestic pigs and identify exposure pathways **YES**

Establishment and maintenance of negligible risk compartment

Vet Authority may recognise compartment as having negligible risk of *Trichinella* if:

1. All herds of compartment comply with biosecurity requirements (Article 8.16.3.) **YES**
2. Prerequisite criteria complied with for ≥ 24 months **YES**
3. Absence of *Trichinella* infection in compartment demonstrated by surveillance taking into account current and historical information, and slaughterhouse monitoring results **YES**
4. Once compartment is established, subsequent program of audits of all herds within compartment is in place to ensure compliance with Article 8.16.3. **YES**
5. If audit identifies significant lack of compliance with biosecurity criteria, the herd(s) concerned should be removed from compartment until compliance is re-established **YES**

Similar to controlled housing requirements listed by EU



Auditing by Independent 3rd party as part of private standard



Next issues to be worked on in Denmark

Meat inspection of outdoor herds: VOI or TMI?

- Hazard of concern: bovine Tuberculosis (bovTB)
- Because of probability of overlooking bovTB, if the mandibular lymph nodes is not cut into
- However, Denmark has been officially free from bovTB for >30 years
- Last case was seen in deer kept under fence in 1990s
- bovTB never detected in wildlife

Other hazards to consider:

- *Toxoplasma gondii* and *Trichinella spiralis*
- Probability of presence higher in outdoor compared to indoor
- But these hazards cannot be detected during ordinary meat inspection