

K-04-01**Modernisation of meat inspection of pigs by use of risk assessments – an evidence-based approach (#29)**Lis Alban

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Introduction:

In 2004, the European Union (EU) legislation opened for a change in meat inspection of finishing pigs, raised indoors, if a risk assessment could show that such a change would not be associated with an increase in risk related to food safety, animal health, or animal welfare. In Denmark, several risk assessments have been undertaken to address this issue.

Materials and methods:

The risk assessment framework developed by the World Organisation for Animal Health (OIE) was used. This includes hazard identification followed by an assessment of release, exposure, and consequences, integrated into a risk estimate. To address these elements, we collected samples from abattoirs and subjected them to standard laboratory investigation. Moreover, slaughterhouse statistics, literature and expert opinion were used. The work was undertaken in collaboration between academia, industry, and veterinary authorities.

Results:

The first assessment dealt with the mandibular lymph nodes and the heart, the second with the intestinal lymph nodes, and the third with the lungs and the liver. For each of these organs, we looked at what would happen if routine incisions and palpations were no longer undertaken. This included addressing what we would miss, how often, and what the consequences of this might be.

Next, focus was directed to carcasses with embolic pneumonia. They may be missed, if the lungs are not palpated routinely, and lesions are not detected in other organs. In this study, finishing pigs with embolic pneumonia were identified. Samples were taken from the heart, liver, spleen, kidney, lungs, joints and muscles. This study showed that the animals had in most cases cleared themselves from the original infection. Moreover, if bacteria were present, they were not considered meat-borne. *Staphylococcus aureus* was the most commonly found bacteria, with the highest prevalence in the lungs (10/19 and with high quantitative numbers) and a lower prevalence in the muscles (6/19 and with a low quantitative number). *S. aureus* is considered an occupational hazard.

Then, focus was broadened to cover purulent lesions indicative of prior septicæmia, caused by a tail bite, months earlier. According to the Danish legislation at that time, such cases should be subjected to a so-called pyaemia examination, focusing on the predilection sites of abscesses. Acute cases should be condemned, and chronic cases should be subjected to de-boning. Use of de-boning was introduced to ensure detection of osteomyelitis, not found in the rework area. The associated annual costs have been estimated

to approx. €3 million. Some of the questions we wanted to address were: 1) Is the meat from these pigs fit for human consumption? 2) Are the meat inspectors able to find what they should find using the pyaemia examination? and 3) Which alternative practices could replace de-boning?

The studies involved samples from finisher pigs and sows with purulent lesions indicative of prior septicæmia. For each case, samples were taken from abscesses present and muscle on the distal part of the right foreleg. As a control group, we collected muscle samples from the right foreleg from finishers and sows, fully approved at meat inspection. The results showed that most abscesses were found during the pyaemia examination – leaving very few to be discovered at de-boning. The bacteria present in abscesses were not considered meat-borne, and if bacteria were present in meat then it was in very low numbers. There was no association between presence of bacteria in the abscesses and in the meat.

The next step was an implementation study, where information about the location of abscesses, overlooked at the pyaemia examination was collected and used to update this examination. This resulted in an amendment of the Danish legislation, so today it is possible for an abattoir to replace the mandatory de-boning with an updated and extended pyaemia examination. The new legislation is expected to lead to less category 2 animal by-products requiring pressure sterilisation.

Discussion and conclusion:

In 2011, EFSA published an Opinion addressing the hazards, which should be covered by meat inspection for swine. In that Opinion, EFSA stated that traditional meat inspection in swine could safely be replaced by visual-only (VO) inspection. In June 2014, the new EU Meat Inspection Regulation came into force stipulating that meat inspection of all swine – irrespective of age or production system – should be undertaken using a VO approach unless food chain information (FCI) or other information from *ante* and *post mortem* indicated otherwise. Most EU Member States (MS) were not ready for this, as it required implementation of a FCI system. Moreover, other MS were impeded to implement VO inspection because of trade agreements.

The incision-by-incision risk assessment approach described above enabled a gradual shift in inspection from traditional inspection to VO. In this way, the large Danish export-oriented abattoirs were able to document the safety of the new system to authorities, trade partners, and meat inspectors.

Research interests:

The research areas are epidemiology and risk assessment including risk-

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based surveillance-and-control for food safety and documentation of freedom from infection. Feasibility and economic considerations of how to motivate stakeholders to induce change of habits and ways of doing are of interest. Focus has been on hazards that play a role for the Danish livestock

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industry including antimicrobial use, resistance, and residues, modernisation of meat inspection, Salmonella, BSE, Trichinella, Toxoplasma, Cysticercus bovis, as well as Classical swine fever and the role of the wild boar.

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