INVESTIGATIONS ON LATENT ZOO NOSES IN THE CONTEXT OF THE SWISS "SCHWEIN 99"-PROJECT

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Livestock producers in developed countries, such as pig producers, are facing the challenge to produce high quality products which satisfy their customers. Quality assurance programmes therefore are likely to become more important in the near future (Blaha, 1997). A prerequisite to the development of such programmes is the knowledge of animal health data, including zoonoses. In this context, an epidemiological study of the pig health and productivity in Switzerland, called "Schwein 99", has been initiated. This study has the overall objective to study the health and production profile of swine in a broad approach, where pigs are expected to be followed from birth to slaughter. Thus it will be carried out at three levels, i.e. at the breeding units, the fattening units and the abattoirs, respectively. This paper presents preliminary results from a pilot study carried out prior to the larger project to investigate the importance of selected zoonoses, Salmonella, Yersinia enterocolitica and Mycobacterium avium, in slaughtered healthy pigs.

MATERIAL AND METHODS

Sample collection: Five pigs were randomly selected per herd and sampled at 2 slaughterhouses in Switzerland. One is a large (supra-regional) slaughterhouse located in Berne, while the other is a smaller (regional) slaughterhouse located in Thun. From each pig, samples of mesenteric lymph nodes and tonsils were taken. So far 250 samples from 50 farms were taken, i.e. 145 samples (29 farms) were collected in Berne and 105 samples (21 farms) in Thun.

Sample analyses:
- Samples from mesenteric lymph nodes are cultivated in different enrichment broths (Tetrathionate and Rappaport-Vassiliadis), then transferred to two different selective agars for the detection of Salmonella (Brilliant-Green-agar and SM ID-agar [bioMérieux]). For the identification we are using a miniaturized biochemical identification kit (Enterotube [Becton Dickinson]). All Salmonella isolates are serotyped (Serotyping performed by the National Reference Laboratory for Foodborne Diseases, Berne, Switzerland).
- To cultivate Yersinia, samples of tonsils are directly plated on a selective agar (CIN-agar) and then identified using a miniaturized biochemical identification kit (API-20E, bioMérieux). To distinguish between the serologic types O:3/O:9 commercial sera (Sanofi/Pasteur) are used in slide agglutination.

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The method for the detection of *M. avium* was described by Bono et al. (1995). In short terms: Samples of mesenteric lymph nodes are cultivated. Presumptive isolates are confirmed using PCR-methods and different restriction enzyme analysis.

PRELIMINARY RESULTS (January to April 97)

*Salmonella:* We found 2 positive samples (*S. Livingstone* und *S. Rissen*). At a number of 250 samples investigated so far, this means 0.8% of the samples were positive for *Salmonella*.
Since the positive samples originated from different farms, this means 2% of the farms were positive.

*Yersinia:*
Regarding samples:

<table>
<thead>
<tr>
<th></th>
<th>Samples</th>
<th>Growth on CIN</th>
<th><em>Yersinia</em></th>
<th><em>Y. enterocolitica</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples</td>
<td>250</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth on CIN</td>
<td>77</td>
<td>30.8%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td><em>Yersinia</em></td>
<td>26</td>
<td>10.4%</td>
<td>33.8%</td>
<td>100%</td>
</tr>
<tr>
<td><em>Y. enterocolitica</em></td>
<td>23</td>
<td>9.2%</td>
<td>29.9%</td>
<td>88.5%</td>
</tr>
<tr>
<td>O:3</td>
<td>2</td>
<td>0.8%</td>
<td>2.6%</td>
<td>7.7%</td>
</tr>
<tr>
<td>O:9</td>
<td>11</td>
<td>4.4%</td>
<td>14.3%</td>
<td>42.3%</td>
</tr>
</tbody>
</table>

3 Samples: *Yersinia pseudotuberculosis*

Regarding farms:

Samples originate from 50 farms:
- 1 positive sample per farm: 11
- 2 positive samples per farm: 4
- 3 positive samples per farm: 1
- 4 positive samples per farm: 1

17 farms with positive samples (34% of the farms)

*Mycobacterium avium:*
Presently we only have complete data from 60 samples (5 farms).
Totally 5 samples are positive for *Mycobacteria* (8.33%)
- 1 sample (each representing 1.66%):
  - *M. neoaurum*
  - *M. xenopi*
  - *M. malmoense*
and
- 2 samples *M. avium-intracellulare* (3.33%)
Preliminary results of further samples indicate probably an increase of this rate.

DISCUSSION

This pilot study is aimed at providing preliminary estimates of the between and within-herd prevalence of infection with zoonotic pathogens such as Salmonella spp., Yersinia enterocolitica and Mycobacterium spp. That only 5 samples per herd at one point in time were taken could be a limitation of the study, but it was considered the optimum number of samples given the capacity of the laboratory. The diagnostic methods used show a 100% predictive value and are believed to be highly sensitive. Preliminary results show an apparent low prevalence of Salmonella spp.. Although infection on farms with 5 negative cultures cannot be definitively excluded, a low true carriage rate of these pathogen is likely. As the study is still in progress, final conclusions are not yet possible.

The results on Yersinia seem to correlate with the data available from neighbouring countries.

The results of the Mycobacterium avium investigations seem to indicate, the possibility that pigs and/or pig products could be a vehicle for these bacteria.

Our results indicate that pigs are a possible source and/or vehicle for these zoonoses. Nevertheless careful processing and handling of pig meat and its products will reduce the risks to a negligible rate.

REFERENCES


ACKNOWLEDGEMENTS

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