Risk factor analysis of *Fasciola hepatica* infections in Danish dairy cattle

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Background

The prevalence of liver fluke (*Fasciola hepatica*) infections in cattle is increasing in Denmark¹, therefore establishment of appropriate guidelines for control is urgently needed.

Aims:

• To identify potential farm level risk factors for liver fluke infection in Danish dairy cattle using slaughter inspection and questionnaire data.
• To compare two different diagnostic methods: slaughter inspection and antibody ELISA of bulk tank milk (BTM).

Materials and methods

<table>
<thead>
<tr>
<th>132 Case farms</th>
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<tbody>
<tr>
<td>1) at least 50 animals were slaughtered in 2013</td>
</tr>
<tr>
<td>2) minimum 3 animals with liver condemnation due to fasciolasis at slaughter in 2013</td>
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<table>
<thead>
<tr>
<th>64 Control farms</th>
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<tbody>
<tr>
<td>1) at least 50 animals were slaughtered in 2013</td>
</tr>
<tr>
<td>2) no animal diagnosed with fasciolasis at slaughter for the last 3 years</td>
</tr>
<tr>
<td>3) within 10 km from the case farms</td>
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• Telephone interviews regarding the types of production, grazing pattern, anthelmintic treatments and management routines during 2013.
• ELISA on BTM (during housing 2013/14) for *F. hepatica*-specific antibodies using Fasciolosis Verification Test (IDEXX).

Statistics

• Univariable analysis for each variable using Chi-square or Fisher’s exact test.
• Comparison of number of ELISA positive and negative herds against case and control herds. (Inconsistencies were examined in terms of herd size, apparent prevalence and age at slaughter etc.)

Results and discussion

RISK FACTORS identified:

• Grazing of heifers on wet areas (p<0.001)
• Grazing of dry cows on wet areas (p<0.001)
• Co-grazing animals of different age groups (p<0.01)
• Performing preventive measures on farm (higher numbers in case than control farms) (p<0.05)

• 12 case farms practiced zero-grazing for all animals!

<table>
<thead>
<tr>
<th>No. Case</th>
<th>No. Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELISA +/ve</td>
<td>99</td>
</tr>
<tr>
<td>ELISA -/ve</td>
<td>33</td>
</tr>
</tbody>
</table>

These farms all had low apparent prevalence (<6%).

No obvious trend in these farms in terms of herd size, apparent prevalence and age at slaughter etc.. Underdiagnosis at the abattoirs® may account for this finding.

Conclusions and perspectives

• Grazing heifers and dry cows on wet areas seem to be associated with fasciolasis in Danish dairy cattle.

• Multivariable analysis is warranted to account for confounders and interaction with other variables.

• It should be kept in mind that diagnosis of fasciolasis by slaughter inspection and ELISA on BTM differ due to e.g. apparent herd prevalence and low sensitivity of slaughter inspection.

• The difficulty of liver fluke control was highlighted as many case herds are already trying to minimise the problems by some preventive measures.

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Suraj Dhakal for conducting ELISA, Dorte Thanning Lavritsen (Euríphes Vitrum Laboratorium A/S) for providing BTM, Erik Rattenborg, Christian Christiansen and Jeppe Bøsø from SEGES for help with identifying farms and creating online questionnaire.

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References