Risk Factors for Foot and Mouth Disease in Beef Cattle Herds in Israel

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Conclusions

- FMD morbidity is abundant in adult beef cattle despite multiple vaccinations. However, it appears that the risk for disease increases when the time gap from the last vaccination is more than 6 months.
- The presence of calves under six months old is a significant risk factor for morbidity in adults.
- The spatial pattern of FMD spread between beef cattle herds is different from its spread to feedlot cattle. The first spread by contact between grazing cattle. The second by transportation of sick animals.

The Middle East

Cattle distribution in Israel

Small ruminant distribution in Israel

Geographical distribution of FMD outbreaks in Israel
Seasonality of FMD outbreaks in Israel

- Outbreak onset was on March and it involved 26 localities that included 30 beef herds, 11 feedlots, 4 dairy herds and 8 sheep flocks.
- Isolation of serotype O, Pan-Asia-2 viruses.

Research Objectives

- Investigating risk factors for FMD morbidity in beef cattle herds.
- Characterization of the FMD spread among beef cattle and feedlot cattle herds.

Analysis of virus spread

- In order to analyze the pattern of virus spread we compared the distance between each affected herd and the most adjacent herd affected prior to it.
- Average distance was compared between feedlots and beef herds.

Analysis of risk factors for FMD among beef herds

- Study area: Golan heights.
**Case-Control study**  
**Golan Heights**

- 25 FMD cases  
- 26 controls  
- Outbreak Case= Beef cattle herd, consisting of at least one sick animal (positively diagnosed)

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**Results – outbreak spread**

- For feedlots the average distance from the previously affected adjacent herd was 19.9 Km (range 2-43.7 Km) while for beef herds it averaged only 3.2 Km (range 0.2-8.9 km) (p=0.01)

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**Results – risk factor analysis**

- In multi-variate analysis presence of calves under 6 months of age and vaccine administration more than six months before the outbreak were found to be significant risk factors for FMD in adult beef cattle

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Odds ratio</th>
<th>CI 95%</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of calves under 6 months</td>
<td>10.581</td>
<td>1.73 to 64.7</td>
<td>0.011</td>
</tr>
<tr>
<td>&gt;6 months elapsed from last FMD vaccination</td>
<td>8</td>
<td>1.2-53.2</td>
<td>0.032</td>
</tr>
</tbody>
</table>

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**Data collection**

- Herdsmen were interviewed by preformed questionnaires:
  - Group data:  
    - location  
    - number of animals  
    - Breed  
    - Age  
    - Origin  
    - Number and date of vaccine administration prior to the outbreak  
    - Time of clinical signs onset and extent of morbidity