Appendix 38

Open Session of the EuFMD Research Group: Focus on science contributing to the roll-out of progressive control of FMD

TRANSMISSION OF FMDV FROM INFECTED BUFFALO (Bubalus bubalis) TO VACCINATED AND NAÏVE BUFFALO AND CATTLE

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Conclusions

• In the present study, FMDV could be transmitted from infected buffalo to naïve buffalo and cattle by direct contact.
• All the vaccinated cattle (7µg antigen payload) were protected. However, one third of vaccinated buffaloes were clinically infected with FMDV.
• Higher antigen payload may be necessary to protect Buffaloes from FMDV infection.
• This signifies the role of buffalo in FMDV transmission that may have an impact on future control strategy.

Introduction

• 98 million buffaloes in India (56% total buffalo population in the world)
• The role of Indian buffalo in FMD epidemiology, transmission and immune response is limited
• The transmission of FMDV infection from infected Indian buffalo to naïve and vaccinated cattle and buffalo

Preparation of buffalo challenge virus O/HAS/34/05

Unvaccinated buffalo
Sirsa district
Haryana state
Homologous ("r" value=>1) to current Indian type O vaccine strain
Maroudam et al., 2008: Journal of Comparative Pathology, 139,81-85

Preparation of buffalo challenge virus O/HAS/34/05

Buffalo passage 3 tongue lesion (24hrs post challenge)
Buffalo passage 3 foot lesion (5 days post challenge)

Buffalo transmission studies groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>No of animals</th>
<th>Vaccine (FA 206)</th>
<th>Dose</th>
<th>Vaccination</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 buffalo calves</td>
<td>O/ IND/R2/75 (7 µg/dose)</td>
<td>2 ml I/M</td>
<td>0 dpv</td>
<td>28 dpv</td>
</tr>
<tr>
<td>2</td>
<td>6 cattle calves</td>
<td>O/IND/R2/75 (7 µg/dose)</td>
<td>2 ml I/M</td>
<td>0 dpv</td>
<td>28 dpv</td>
</tr>
<tr>
<td>3</td>
<td>6 buffalo calves</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>28 dpv</td>
</tr>
<tr>
<td>4</td>
<td>6 cattle calves</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>28 dpv</td>
</tr>
<tr>
<td>5</td>
<td>12 donor buffalo calves</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>

dpv - days post vaccination
Animal experiment

Group 1
- Donor buffaloes
- Direct contact challenge for 5 days
- Rooms 1 to 6

Group 2
- GI(B1)
- G2(C1)
- G3(B1)
- G4(C1)

Group 3
- GI(B2)
- G2(C2)
- G3(B2)
- G4(C2)

Group 4
- GI(B3)
- G2(C3)
- G3(B3)
- G4(C3)

Protection percentage

<table>
<thead>
<tr>
<th>Groups</th>
<th>No of animals</th>
<th>Vaccine</th>
<th>Percentage Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 buffalo calves</td>
<td>O/IND R2/75 (7 µg/dose)</td>
<td>67 (4 out of 6)</td>
</tr>
<tr>
<td>2</td>
<td>6 cattle calves</td>
<td>O/IND R2/75 (7 µg/dose)</td>
<td>100 (6 out of 6)</td>
</tr>
<tr>
<td>3</td>
<td>6 buffalo calves</td>
<td>Nil</td>
<td>0 (0 out of 6)</td>
</tr>
<tr>
<td>4</td>
<td>6 cattle calves</td>
<td>Nil</td>
<td>0 (0 out of 6)</td>
</tr>
<tr>
<td>5</td>
<td>12 donor buffalo calves</td>
<td>Nil</td>
<td>0 (0 out of 12)</td>
</tr>
</tbody>
</table>

FMD clinical signs - Donor buffalo

Foot lesion In-contact buffalo 2 dpc

Tongue lesion In-contact unvaccinated cattle 2 dpc
In-contact unvaccinated cattle nasal and feet lesion 7dpc

Serum neutralizing antibody response

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Acknowledgements

- Animal Holding farm, Indian Immunologicals Limited, Hyderabad