Foot and mouth disease control strategies in North Africa and the Middle East
The current situation
Asuncion, Paraguay, 24-26 June 2009

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OIE Regional Representative for the Middle East
Acknowledgements

• OIE – FAO Regional Animal Health Centre North Africa – Tunis

• OIE – FAO Regional Animal Health Centre Middle East - Beirut
References

• Questionnaires, discussions, conclusions and recommendations of:

  – 4th FMD Round Table for the control of the disease in the Middle East, Amman, September 2007
  – 5th FMD Round Table for the control of the disease in the Middle East, Beirut, April 2009
  – 4th FMD Round Table for the control of the disease in North Africa, Rabat, October 2007
• Particularities of the region
• The current situation i) in the Middle East and ii) in North Africa
• Current strategies adopted to control the disease
• What could be done – An example: the Middle East
• General conclusions
Particularities of this region

- Large ruminant livestock resources in most countries, providing livelihood and employment to a high proportion of the population
- Extensive land border
Particularities of this region

• Much of the region is arid or semi-arid, which drastically limits the potential availability of natural pasture.

• Importance of transhumance and animal movement between neighbouring countries, notably in order to satisfy people needs during Muslim special events (Hajj and Ramadan).

• Such fluidity has significant consequences for the spread of animal diseases, FMD notably.
Main Animal movement ways
The current situation in the Middle East
Circulating strains in the ME

- FMD is endemic and widely spread among various animal species in the Middle East
- Different strains and variants of FMD viruses are present: principally O and A strains
- Periodic devastating epidemics with new serotypes spread rapidly across national and regional borders
Circulating strains in the ME

- In 2005, A-Irn-05 emerged in Iran
- Since then this strain spreads to Saudi Arabia, Turkey (including Thrace), Jordan, Afghanistan, Pakistan and recently Iraq, Kuwait, Bahrain, Lebanon and Libya
- Since August 2007, a new sublineage appears in Turkey (A Iran 05-ARD-07)
Circulating strains in the ME

• In 2006, FMDV type A was introduced into Egypt from East Africa
• New cases in 2009
• This suggests the establishment of this East African strain in the Mediterranean region
Circulating strains in the ME

- In 2006 - 2007 new O lineage: O PanAsia 2
- Probably originated from India (2001)
- Dispersal to Afghanistan, Pakistan, Iran, Jordan, Turkey, Israel, PAT, Lebanon (probably), UAE, KSA and Egypt
- Vaccine matching with O Manisa
In April 2009, Bahrain reported to the OIE one outbreak of Asia 1 linked with the introduction of new live animals in the country.

Circulating strains in the ME
The current situation in North Africa
Circulating strains in North Africa

Sporadic occurrence – Last reports of FMD

Tunisia 1999/ O

Algeria 1999/O

Libya 2003 /SAT2 2009 /A Iran 05

Morocco 1999/ O

Mauritania 2006/ A
Circulating strains in North Africa

Main sources of infection

Middle-East Serotypes O, A and Asia1

West Africa Serotypes O, A, SAT1 and SAT2

East Africa Serotypes O, A, C, SAT1 and SAT2
Current strategies adopted to control the disease
• Laboratory and Sampling
• Surveillance
• Vaccination
• Emergency response
• Awareness programmes
Laboratory and Sampling

• All countries have a national official laboratory which performs FMD analyses, essentially serological analyses using ELISA tests
• Some laboratories in the region can work with live virus: Iran, Jordan, Syria, Turkey, Egypt and Morocco
• The OIE - FAO World Reference Laboratory (Pirbright) is the main reference laboratory where sample are sent
Laboratory and Sampling

- Few samples are sent to the WRL – example of the Middle East

Number of samples sent to WRL for virus isolation

Specific FMD Project

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Serosurveillance

Some countries have regular continuous serosurveillance programmes – with different objectives:

– To assess FMD prevalence: Turkey, Iran, North African countries
– To evaluate immune status and post vaccination response: Bahrain, Egypt
– To detect virus introduction: Cyprus

In other countries, serosurveillance programmes are occasional – **serosurveys** – To assess FMD seroprevalence
Vaccination

FMD vaccination is conducted in almost all of countries:

- either compulsory or implemented on a voluntary basis
- generally free of charge
- Monitored in few countries (Maghreb, Egypt)

Different vaccines and suppliers are used in the Middle East:

- Egypt, Jordan, Iran and Turkey are vaccine producers
- Other supplier sources are Europe, India, Russia and Botswana (only for Sudan)
- Morocco produced also vaccine from imported concentrated Antigen
## Vaccination – Middle East Cattle

<table>
<thead>
<tr>
<th>FMD Vaccine Type</th>
<th>Country</th>
<th>Annual Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quadrivalent vaccine (O, A, SAT1 and SAT2)</td>
<td>Sudan (06)</td>
<td>Once</td>
</tr>
<tr>
<td>Tetravalent vaccines (O, A, Asia 1 and SAT 2)</td>
<td>Kuwait</td>
<td>3 times</td>
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<tr>
<td></td>
<td>Qatar</td>
<td>Once or twice</td>
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<tr>
<td>Trivalent vaccines (O India 53/73, A Iran 96, Asia 1)</td>
<td>Syria</td>
<td>Twice</td>
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<tr>
<td></td>
<td>Bahrain</td>
<td>Twice</td>
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<td>Iran</td>
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<td>Iraq</td>
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<td>Turkey</td>
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<td>Egypt</td>
<td>Twice or 3 Times</td>
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<tr>
<td></td>
<td>Jordan</td>
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<td></td>
<td>Turkey</td>
<td>Twice</td>
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<td></td>
<td>Yemen</td>
<td>Twice</td>
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</table>

- **Trivalent (O, A 22, Asia 1)**
- **Bivalent vaccines (A and O Manisa).**
Vaccination – Middle East Cattle

FMD Cattle vaccination - Annual Frequency

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## Vaccination – Middle East Small Ruminants

<table>
<thead>
<tr>
<th>FMD Vaccine Type – Sheep and Goats</th>
<th>Country</th>
<th>Annual Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetravalent vaccines (O, A, Asia 1 and SAT 2)</td>
<td>Qatar</td>
<td>Once – twice</td>
</tr>
<tr>
<td>Trivalent vaccines (O India 53/73, A Iran 96, Asia 1)</td>
<td>Syria</td>
<td>Once</td>
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<tr>
<td>Trivalent (O, A 22, Asia 1)</td>
<td>Bahrain</td>
<td>Twice</td>
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<td>Iran</td>
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<td></td>
<td>Jordan</td>
<td>Twice – 3 times</td>
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<td></td>
<td>PAT</td>
<td>Once - Twice</td>
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<tr>
<td>Monovalent (O Manisa)</td>
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Vaccination – Middle East

The vaccination number is very variable country by country

• In countries where the vaccination is implemented on a compulsory basis, the immune population ratios are fluctuating between 30 to 85% in cattle, 40 to 90% in sheep and goats
Vaccination – Middle East

• In those where the vaccination is implemented on a voluntary basis, the ratios are very low or no information is provide.
• except for the PAT where 78% of the cattle population and 63% of the sheep and goat population were vaccinated in 2007.
## Vaccination – North Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Strategy</th>
<th>Type of FMD vaccine</th>
<th>Annual Frequency</th>
<th>Vaccinated population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morocco</td>
<td>Stopped in 2007 Before Mandatory and free</td>
<td>Monovalent O North Africa</td>
<td>Once between Sept to Dec</td>
<td>90</td>
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<tr>
<td>Tunisia</td>
<td>Mandatory and free</td>
<td>Tetravalent O Manisa, O Maghreb, A22, SAT 2</td>
<td>Once between Sept to Dec</td>
<td>75</td>
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<tr>
<td>Algeria</td>
<td>Mandatory and free</td>
<td>Bivalent O Manisa, A 22</td>
<td>once</td>
<td>70</td>
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<tr>
<td>Libya</td>
<td>Depends on FMD situation Around outbreaks</td>
<td>Tetravalent A, O, C, SAT 2</td>
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</tbody>
</table>

Vaccination in small ruminants is done in Tunisia (O, A, SAT2) and Libya (O, A, C, SAT2)

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Vaccination – Summary

• Vaccination strategies and vaccines strains used in this region are very heterogeneous
• Vaccination calendar are not often linked with epidemiological situation
• Vaccination coverage is not satisfactory in most of the countries
• The control vaccination efficacy is rarely implemented
Emergency response

• FMD is a mandatory notifiable disease in all countries.
• Only a few countries have a National Emergency Fund available for FMD emergency response.
• In the Maghreb region, zoning is implemented to restrict animal movement in case of emergency.
• No Emergency Antigen Bank is available in any country.
• An Emergency Stock of Vaccine is available only in very few countries.
• Punctual agreement could be signed for vaccine supplying in emergency situations.
Awareness programmes

• All countries have awareness programmes on FMD, mainly focused on farmers, with sometimes regular training
• Depending on country situation, regular meetings are organised with farmers and farmers associations, or on a regular basis
• Media awareness programmes are used in some countries
FMD Situation in the MENA - Conclusions

MENA :

- One of the FMD high risk regions
- High weight of infection with antigenic diversity
- Source of emergent viruses
- Threat for neighbouring regions
What could be done to control the disease
Regional Approach

MENA region could be divided in 2 sub-regional epidemiological units

RAHC - Beirut

RAHC - Tunis

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Summary of the frame developed for the Middle East – 5th FMD Round Table Beirut
General framework

The main objective of the programme is to increase and harmonise the level of FMD surveillance and control in the Middle East region, including:

- Assessing current country strategies to manage the disease
- Harmonisation between countries surveillance strategies, vaccine programs, vaccine monitoring, animals and animal products movement control
- Training technical staff to conduct appropriate prevention and control measures against the disease
- Implementing appropriate measures and methodologies in collaboration with the WRL for FMD, to identify FMD strains circulating in the region and potential introduction of others
General framework
Taking into account the Progressive Control Pathway - Annual Self Assessment

- Use of the tool developed by FAO (part of the progressive FMD risk reduction approach) → level 0 to 5
- Presented during the 5th FMD Round Table and answered by the CVOs of the region

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General Conclusions
Conclusions

- FMD is a **main constraint** of animal production in the MENA region
- To control the disease in the region, **vaccination** in large ruminants, sometimes also in small ruminants, is the common strategy adopted. These vaccination programs are **not harmonized** between countries with regularly a **poor vaccine matching**
- The lack of relevant and harmonized **surveillance programs** with well trained staff, the lack of **early warning** and **rapid response systems** in most countries of the region and the **poor level of transparency and collaboration** between countries are important factors hampering the well control of the disease
Conclusions

• The extensive land border in the region and the importance of transhumance and animal movement between neighbouring countries, notably in order to satisfy people needs during Muslim special events (Hajj and Ramadan) make the disease control even more difficult.

• Furthermore, some countries are not able to secure funding within their budgets for FMD surveillance and control programs.

• The MENA region is much more complex than other regions, regarding its geographical location, at the crossing of three continents, and shall be recognized as a high risk area for the spread of FMD virus to neighbouring regions, especially Europe.
Conclusions

- The implementation of a harmonized and coordinated program to control the disease shall be a priority, position regularly wished by regional countries.
- The newly created OIE – FAO Regional Animal Health Centres, in Beirut and Tunis, under the auspices of Regional Steering Committees of the GF-TADs shall be the relevant structures to carry such program in the frame of a global strategy.
Thank you for your attention