Introduction

A Workshop on the improvement of FMD control in Turkey was held on the 25-26th March in Ankara, Turkey, under the co-operative program of activities between the FAO/EUFMD Commission and the Ministry of Agriculture and Rural Affairs, Turkey, with support from the European Commission (via agreement EC and FAO, MTF/INT/003/EEC). The meeting was hosted by the SAP Institute, and co-organised by FAO Turkey with MARA. The meeting was attended by MARA Undersecretary (Dr. Nihat Pakdil), the Director General of GDPC (Dr Aydemir) and two Deputy DGs, by 2 Department Heads (Animal Health and Animal Quarantine, and Animal Movement). In addition VCRI and Provincial Animal Health Directors from east (Ardahan), central (Ankara) and Thrace (Edirne), the Director (Dr Ergul) and staff of the SAP Institute, State Planning Institute (SPO), and the Under-Secretariat of Treasury attended and participated. FAO –Turkey was represented by Ms Melek Cakmak, Assistant Representative, and the EC Delegation in Turkey by Ms Nermin Kahraman. Technical participants invited by FAO were the EUFMD Standing Technical Committee (Dr Aldo Dekker, Chairman of the Group), and Dr Don King (WRL for FMD, Pirbright), and Tom Murray (Ireland).

The meeting was Chaired by the EUFMD Secretary, Keith Sumption. Dr Haluk Askaroglu, Head of the Animal health Department, GDPC, co-chaired day 1, and Dr Betullah Okeh, Deputy DG, co-Chaired day 2.

The participants are listed in Appendix 1.

Executive Summary

The Workshop Objectives were:

- to identify lessons and action points arising from the EUFMD/EC/GDPC program of activities in 2007 in FMD outbreak investigation, sero-surveillance, and critical control points to prevent spread through the market chain;
- to identify the key changes that must occur to maintain epidemiological units, enterprises and areas free of FMD;
- to identify the key changes that must occur to enable early and effective response to new FMD incursions;
to identify the information required by the FMD Steering Committee to monitor improvements in the prevention of FMD outbreaks and response to new events;

to formulate recommendations for surveillance actions, responsibilities and analyses required to measure progress in FMD control, in 2008-2009.

Workshop Conclusions:

1. Conclusions - from reports presented and workshop discussions;

1.1. the finding that the majority of animals in eastern Turkey meet FMDV infection in the first 3 years of life, and therefore that FMDV is a widespread and common infection of young animals, indicates a poor success of current policy measures to prevent new infections in east of the country;

1.2. young animals appear to be the main vehicle for transmission of infection to initiate new outbreaks

1.3. around 50% of outbreaks relate to entry in illegal or legal animal introduction

1.4. intense and frequent live animal transactions occur within the first year of life, with young animals (especially calves) for summer grass fattening, and trade in larger animals (8-10 months) for winter fattening in central/western Anatolia

1.5. a significant problem of infection following human activities associated with visits to villages of dealers and market visits by livestock farmers was identified;

1.6. village level biocontainment measures (following outbreaks) are not enforced, and since local extension of epidemics can occur by contact on common grazing and watering points, the unit for control must be wider than the single village

1.7. the current reporting and FMDV confirmation system is far too slow to achieve detection of new incursions (strains) of FMDV

1.8. lack of confidence in the delivery of mass vaccination; participants did not believe that constraints to delivering high vaccination coverage were being addressed, and did not consider that the move away from privatised delivery to free vaccination by Government services would increase coverage rates

1.9. overall lack of confidence: the majority of workshop participants did not consider the FMD control situation at the end of 2010 would be better than at the start of 2008.

Recommendations

1 Utilise human and vaccine resources more efficiently : by focussing on achieving vaccination in young animals, since these act as the main vehicle for spread. In some regions, a shift in human effort to vaccinate calves could met by reduced vaccination in other ages (e.g. cessation of vaccination of animals over 3 years could be considered, because of levels of natural immunity and past vaccination)

2 During next two years, create and implement a set of incentives of interest for animal producers/traders that will re-inforce the principle that only well vaccinated animals be traded (be given movement permits, though entry of vaccination records on the animal passport/ID).

3 Key changes that must occur to maintain epidemiological units, enterprises and areas free of FMD:

3.1. focus effort on immunisation of young animals with the objective of achieve immunity in most animals before they are first traded;

3.2. create incentives that stimulate buyers and seller demand for vaccination;

3.3. ensure vaccination records are entered into TURKVET, and vaccination status of individual is a condition for permission to move;

3.4. create awareness of FMD prevention measures for each class of production unit (village, large scale fattening and dairy units)
3.5. cleaner (in terms of FMD contamination) vehicles and animal markets, achieved through lowering rate of entry of infected animals (“safety through immunisation”) and hygienic standards (through licensing of animal dealers and of live animal markets, and penalties)

4 Key changes that must occur to enable early and effective response to new FMD incursions;
4.1. delays from clinical signs to FMDV type confirmation must be reduced from about 19 days to 5 days or less; to achieve this, evaluate the use of rapid-test systems to reduce delays to confirm infection
4.2. new initiatives and imaginative approaches will be needed to address the poor reporting rate; these include incentives for reporting or removing penalties (anonymous reporting etc)

5 Information required by the FMD Steering Committee to monitor improvements in the prevention of FMD outbreaks and response to new events;

This section was developed by the Chairman based on discussions in working group 3; as that group not reach or present their final conclusions

5.1. summary reports should be provided to each Steering Committee meeting, including:
5.2. results of baseline, national surveys (in 2008 and 2010) to measure change in incidence of FMDV, focus on young animals as the indicator of recently acquired infection;
5.3. result of regular monitoring (every 3 months), of sero-surveillance conducted through market surveys, to measure performance of vaccination in the traded animal population, and to measure impact of vaccination upon incidence in the traded animal population;
5.4. reports of sero-surveys in key indicator provinces to validate the claimed vaccination coverage;
5.5. a summary report combining molecular typing of strains with other data from field investigations to provide an explanation
5.5.1. how many virus strains are circulating in past months;
5.5.2. why outbreaks occur in “free” Provinces.
5.6. performance of surveillance system: summary statistics indicating the performance of the system must be given, as indicated in the Working Group report (delay reporting to conformation)

6 Recommendations for surveillance actions, responsibilities and analyses required to measure progress in FMD control, in 2008-2009.
6.1. to implement the above actions (under 6) to provide information every 3 or 6 months to the Steering Committee
6.2. surveillance activities should be demand-driven, with the FMD project Steering Committee, and/or the GDPC, should play a driving role to commission reports, studies and request information that will enable decisions to be taken to improve management of FMD;
6.3. a National FMD epidemiology unit should be established for the duration of the FMD project, comprising one principal and one deputy epidemiologist from GDPC and SAP Institute, to be trained on the job by international experts (FAO/EUFMD/EC, according to funding possibilities) ;
6.4. The above unit should facilitate the following actions:

- design of surveillance and serosurveillance activities;
- analysis and interpret data generated from those activities;
- identify changes in risk and produce early warning, based on assessment of all relevant data and circumstances;
- contribute to and promote contingency planning, new policies and actions;
- organize dynamic training course for field vet services;
- produce reports for monitoring progress, twice a year in order to monitor project output and define new policies and strategies.

6.5. At the national level, a well structured database should be maintained used the information which is from outbreak information data (TURKVET), vaccination coverage, outbreak investigation activities and passive and active disease survey (clinical) activities and serosurveillance activities.

6.6. GDPC should maintain the system of immediate (<48 hrs) outbreak investigation, in the event of new outbreaks in Thrace region, or in normally free regions of western Turkey;

6.7. the Terms of Reference of the Steering Committee of the FMD control project should be extended to encompass a wider assessment of the progress of FMD control in Turkey, and provide guidance to GDPC on corrective actions;
Workshop report

Opening

The Workshop was opened by the Director General (Dr Mustapha Aydemir) of GDPC and MARA, and by representatives of the European Commission (Ms Kehraman) and FAO (Dr Sumption). Dr Aydemir and Ms Kehraman each put emphasis on the importance of the timing of the workshop, which should provide important recommendations that will guide the MARA in implementing the Turkey/EU project on FMD control. The EU will be supporting the project, which has a budget of 65 million € and which was officially launched on XXX. Dr Sumption, on behalf of FAO, indicated that the program of FMD related activities being implemented by FAO in Turkey is part of a wider commitment of the EUFMD and of FAO to support member countries to reduce the threat of FMD in west Asia. In the period 2005-9, the EUFMD with EC support has an agreement to implement assistance to FMD control in Iran, the three countries of the southern Caucasus and in Syria; in addition with Italian funding, support is being provided to a regional improvement of surveillance for FMD in 6 central Asian countries, including Pakistan and Afghanistan; thereby a co-ordinated effort is being made to improve the early warning of epidemics, and reduce the risks of spread, that should assist Turkey in its efforts to bring FMD under control through efforts largely based on vaccination. He indicated that given the large national commitment and international co-ordination, the time was now right to draw up a regional strategy and common vision for control of FMD in West Asia, and that Iran had offered to host the first meeting to develop the vision, in August 2008.

Agenda and Objectives of the Workshop

Dr Sumption reviewed the background to the workshop (App 2); emergency response actions of the EUFMD, in concert with EC (SANCO) had been made since the type A epidemic in January 2006. In 2006 this had largely been emergency missions and supply of FMD vaccine for emergency campaigns and to make good the shortages in national vaccine stocks; in 2007 the support was widened to include activities to improve the investigation and reporting of FMD outbreaks, and to plan and implement sero-surveillance actions that would assist planning for the subsequent Turkey/EU FMD project. Since the implementation of the latter had been delayed by over one year, the EUFMD/EC support had continued for circa 14 months, providing a unique set of investigation reports and collected experience, which should improve the understanding of why FMD occurs and what issues must be addressed to improve the likely success of the 2008-2010 FMD control program.

The Workshop Objectives were:

- to identify lessons and action points arising from the EUFMD/EC/GDPC program of activities in 2007 in FMD outbreak investigation, sero-surveillance, and critical control points to prevent spread through the market chain;
- to identify the key changes that must occur to maintain epidemiological units, enterprises and areas free of FMD;
- to identify the key changes that must occur to enable early and effective response to new FMD incursions;
- to identify the information required by the FMD Steering Committee to monitor improvements in the prevention of FMD outbreaks and response to new events;
- to formulate recommendations for surveillance actions, responsibilities and analyses required to measure progress in FMD control, in 2008-2009.

The Expected outcomes:
- clarity on what will be measured (and reported) to enable the GDPC/Steering Committee to monitor and evaluate FMD control performance at national and regional/provincial level;
- recommendations to the GDPC/Steering Committee on the strategy and key changes required to prevent FMD transmission through the animal marketing chain;
- clarity on implementation issues and the need, if any, for further technical inputs from the EUFMD Commission.

**Current status and plans for FMD control in Turkey**

Dr Askaroglu, Head of the Animal Health Department, provided an overview (App 3) of the recent FMD situation, and the National FMD control program being implemented with EU financial support in the period 2008-2010. In 2007, 809 outbreaks were recorded in Turkey, of which 482 outbreaks were due to type O, 56 outbreaks due to type A, and 271 outbreaks of unknown origin. In the past 2.5 years, both of the previous circulating type A and type O strains had been replaced by new strains (type A Iran 05, and O PanAsia 2).

He explained that the aim of the Turkish FMD control program, implemented with financial assistance of the EU (budget 65 m€, to end 11/2010), is to:

- achieve the status of freedom from FMD under vaccination for Thrace region, through a period of 24 continuous months without FMD outbreaks or virus circulation;
- achieve control of FMD throughout much of Anatolia, through a greater than 90% vaccination coverage in large and small ruminants;
- to achieve the pre-conditions so that the Council Directive CD 2003/85/EC can be fully applied.

He explained the vaccination strategy that had been adopted by the project Steering Committee to address the insufficiency in vaccine to met the stated campaign targets for 2008. Spring vaccination would occur between 15th Feb-15th April, with supplies from SAP Institute, Merial and Intervet; the aim was to maintain 2x bovine vaccination, but original target of ovine vaccination would not be pursued. The program would need to achieve higher vaccination coverage in the eastern provinces, whereas in the west the current levels were considered mostly to be satisfactory.

**Vaccination policy: 2008**

**Bovine Animals:**
- Vaccination twice a year in spring and autumn
- Trivalent vaccine in Thrace Region and border provinces
- Bivalent vaccine in Anatolia
Ovine and Caprine Animals: 2008

- Vaccination not to be conducted in the Blacksea and Mediterranean Regions in spring
- Bivalent vaccine in the Marmara region
- Trivalent vaccine in the Thrace region
- Vaccination of 25-30% of the population in Anatolia

The project required also a minimal level of sero-monitoring involving circa 30,000 samples from Thrace region (3 surveys, each 9600 samples from bovines plus one in sheep) and circa 30,000 samples from Anatolia (3 times, plus once in sheep) to assess progress/impact.

On behalf of GDPC he requested further involvement and support of the EUFMD Commission to assist in design, analysis and training of staff for epidemiology studies that would support management of the program.

Lessons learnt from the FAO/GDPC program of activities conducted – 2007-8: summary of papers

1. Why FMD outbreaks occur - Results and lessons learnt from outbreak investigations (Zafer Zog)

In total, 70 FMD outbreaks were investigated between 6 February 2007 and 7 March 2008 in Turkey. 22 outbreaks were due to type O, 9 outbreaks were due to type A; 39 outbreaks considered to be FMD following the initial report and the investigation visits, were not confirmed by virus typing. The FMD outbreak investigation were conducted by project NCs with coordination by GDPC and FAO.

<table>
<thead>
<tr>
<th>Most Likely Source</th>
<th>%</th>
<th>Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal movements</td>
<td>38</td>
<td>74% illegal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24% legal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35% long distance, 30% local</td>
</tr>
<tr>
<td>Animal markets</td>
<td>22</td>
<td>64% associated</td>
</tr>
</tbody>
</table>
with farmer buying animals (22*64 = 14%), 36% to market visits with no purchases

<table>
<thead>
<tr>
<th>Visitors</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common grazing and common water sources</td>
<td>12</td>
</tr>
<tr>
<td>Contiguous Infected Villages (IVs)</td>
<td>6</td>
</tr>
<tr>
<td>IV's between 1km to 3km</td>
<td>1</td>
</tr>
<tr>
<td>Feed bought</td>
<td>1</td>
</tr>
<tr>
<td>Farm has land adjacent to public road</td>
<td>1</td>
</tr>
</tbody>
</table>

65% of these were visits of animal dealers, 14% to vet visits

In the majority (51%) of outbreaks the mostly likely source was a live animal purchase (38% plus 14% of outbreaks involving market purchases). The other 49% comprised visits to markets with no purchases, visitors (principally dealers), and "local sources and contacts". The age of the animals purchased were mostly young (6-18 months).

A second paper, giving further analysis of the outbreak investigations was presented by Dr Tufan (Appendix ...). A summary table is given below:

<table>
<thead>
<tr>
<th>What age of animals brought in the infection?</th>
<th>Especially young animals (6-18 months) but also 3-5 years old animals (heifers and cows, sheep &amp; goats) are brought in the infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>How soon after entry was infection seen?</td>
<td>Generally 1 to 5 days after entry of the animals was infection seen in the village, less often 5 to 10 days after entry of the animals.</td>
</tr>
<tr>
<td>How many FMD outbreaks were primaries (no local source identified) and secondaries (evidence of local source found)?</td>
<td>-58 outbreaks were primaries, -12 outbreaks were secondaries</td>
</tr>
<tr>
<td>What ages were affected?</td>
<td>Especially young animals such as calves and lambs.</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>What was the level of herd vaccination coverage in these villages?</td>
<td>Wide variation; 25% had high vaccination coverage (&gt;85%), 50% were between 50-85% coverage. This may lie behind the finding that generally few farms were affected of the total in the village, at time of investigation.</td>
</tr>
</tbody>
</table>
| Why do some villages or units report FMD or not? Any common features? | - Notification of the FMD varies between region, farmers and head of villages  
- Some farmers and even head of villages ignore FMD, they are living together with FMD and they do not complain about it especially in the rural area. - Biosecurity system is one of the important points affecting notification. If any village has FMD, there is no permission for life animal and animal production movement according to Law 3285. That's why; Most of farmers do not want to notify the FMD. - Nobody would like to be in the village first person for notification of the FMD. |
| What are the main risk routes for FMD leaving an infected village? | - Live animal market contacts,  
- Direct contact with livestock (Visitors/vehicles, Trader)  
- Communal grazing areas, |
| Does any restriction measure work after a few days or do livestock keepers behave as normal? | Most of people ignore the biosecurity system (quarantine, cordon, movement of animal and animal production, movement of vehicle, milk car, traders etc.) there are difficulties to implement restriction measures at the rural areas. |

Recommendations of the FAO national consultants:
- address reasons why susceptible and infected animals are traded, by  
  o permitting only well vaccinated animals at markets  
  o only allowing movement permits if the district is free (change from village level)  
- better information to buyers on the local risk; to reduce buying from infected markets/districts
address the risk associated with dealers: introduce licensing of dealers, penalties or license confiscation for laws on movement, and to drive up application of biosecurity (disinfection etc)

Recommendation of the Working group:
- measures to reduce risk of FMD entry into villages were identified by Group 2 (Appendix ...)
- discussion on this...

2. The scale of the problem of FMD exposure in the traded livestock populations; results and lessons learnt from the pilot national market and slaughterhouse survey (early 2008).

Dr Bulut, SAP Institute, presented the results of a pilot study conducted in early 2008 with the objectives to identify the exposure to FMD virus (NSP antibody sero-prevalence) in animals sampled at same time of year in livestock markets and abattoirs in 6 regions of Turkey. This was the first time such a study had been conducted; at time of report, the level of immunity (vaccination plus natural infection) in traded animals (% of animals with SP titres considered protective) had not been concluded. Once completed, this should give a better indication of the level of susceptibility in traded animals (markets) and at the end of productive life (slaughterhouse).

The results were analysed by age and origin of animals, using the animal ID to trace the “origin” of animals. This allowed an assessment of the contribution of origin to the % seropositivity of traded animals.

The VCRI locations are shown in figure X; Adana and Ankara did not participate in the pilot study.

The conclusions of this survey:
1. >80% of animals in the market survey were < 1 year of age; in this category, seropositivity in eastern provinces was > 28% whereas in the west and west-central Anatolia (Konya) it was < 8%
2. >70% of animals sampled in the slaughterhouse survey were aged between 1 and 3 years; far less variation was seen between regions in the % sero-positivity
3. the results indicate very high exposure of animals to FMD in certain parts of Turkey, which as a result of movements to fattening and slaughter result in very widespread distribution of FMD exposed animals
4. with exposure rates of >85% in the slaughtered population, FMD must be considered a common infection, affecting the majority of animals in eastern Turkey during their productive lives.
5. the results support the hypothesis that FMD is under control in parts of western Turkey,
but not under control in eastern and east-central Anatolia

the lack of variation in % positivity between age groups in the slaughtered population requires explanation; possibly the marketing and fattening processes prior to slaughter present much higher risk, since high % exposure was recorded even in young animals

the wide variation in origin of animals at each market requires caution in interpretation, as the survey results may not reflect the incidence in the provinces where markets are located.

Figure x. Location of the 8 VCRI Insitutes: each participated in the sero-surveillance, except Adana (southern) and Ankara.

<table>
<thead>
<tr>
<th>REGIONS</th>
<th>Anm.market</th>
<th>Slaughterhouse</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of (+)</td>
<td>Rate of pos. (%)</td>
<td>No of (+)</td>
</tr>
<tr>
<td>Ankara(337)</td>
<td>37</td>
<td>24,83</td>
<td>103</td>
</tr>
<tr>
<td>(149/188)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Istanbul(761)</td>
<td>93</td>
<td>25,76</td>
<td>275</td>
</tr>
<tr>
<td>(361/400)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>İzmir(631)</td>
<td>9</td>
<td>2,85</td>
<td>155</td>
</tr>
<tr>
<td>(315/316)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Konya(630)</td>
<td>23</td>
<td>7,30</td>
<td>122</td>
</tr>
<tr>
<td>(315/315)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samsun(640)</td>
<td>137</td>
<td>41,64</td>
<td>100</td>
</tr>
<tr>
<td>(329/311)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erzurum(556)</td>
<td>189</td>
<td>59,06</td>
<td>205</td>
</tr>
<tr>
<td>(320/236)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elazig(642)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(342/300)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28,36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>124</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41,33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>221</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34,42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total=4197</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2131/2066)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>585</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27,45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1084</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52,46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1669</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39,76</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Slaughterhouse survey: by age

<table>
<thead>
<tr>
<th></th>
<th>&lt;1</th>
<th>1 to 2</th>
<th>2 to 3</th>
<th>&gt;3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTANBUL</td>
<td>0.40</td>
<td>0.69</td>
<td>0.59</td>
<td>0.38</td>
</tr>
<tr>
<td>IZMIR</td>
<td>0.36</td>
<td>0.53</td>
<td>0.38</td>
<td>0.46</td>
</tr>
<tr>
<td>KONYA</td>
<td>0.40</td>
<td>0.32</td>
<td>0.37</td>
<td>0.64</td>
</tr>
<tr>
<td>SAMSUN</td>
<td>0.40</td>
<td>0.25</td>
<td>0.31</td>
<td>0.38</td>
</tr>
<tr>
<td>ERZURUM</td>
<td>1.00</td>
<td>0.73</td>
<td>0.81</td>
<td>0.89</td>
</tr>
<tr>
<td>ELAZIG</td>
<td>0.43</td>
<td>0.33</td>
<td>0.43</td>
<td>0.42</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.42</td>
<td>0.46</td>
<td>0.47</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Age classes - sampled

<table>
<thead>
<tr>
<th></th>
<th>198.00</th>
<th>563.00</th>
<th>674.00</th>
<th>325.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>0.11</td>
<td>0.32</td>
<td>0.38</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Market survey: by age

Note: small sample size of animals > 2 years

<table>
<thead>
<tr>
<th></th>
<th>&lt;1</th>
<th>1 to 2</th>
<th>2 to 3</th>
<th>&gt;3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISTANBUL</td>
<td>0.02</td>
<td>0.14</td>
<td>0.62</td>
<td>0.83</td>
</tr>
<tr>
<td>IZMIR</td>
<td>0.02</td>
<td>0.00</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>KONYA</td>
<td>0.07</td>
<td>0.00</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>SAMSUN</td>
<td>0.41</td>
<td>0.35</td>
<td>0.57</td>
<td>0.60</td>
</tr>
<tr>
<td>ERZURUM</td>
<td>0.54</td>
<td>0.97</td>
<td>0.40</td>
<td>0.67</td>
</tr>
<tr>
<td>ELAZIG</td>
<td>0.28</td>
<td>0.14</td>
<td>0.47</td>
<td>0.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.25</td>
<td>0.30</td>
<td>0.58</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Age classes-number sampled

<table>
<thead>
<tr>
<th></th>
<th>1584</th>
<th>203</th>
<th>107</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>0.82</td>
<td>0.11</td>
<td>0.06</td>
<td>0.02</td>
</tr>
</tbody>
</table>

3. Understanding and influencing livestock markets and marketing of ruminants in Turkey

The results of a survey on livestock marketing were presented by Dr Bulent Gulcubuk, FAO consultant. This survey had been conducted in 5 Provinces in east and central Anatolia, with the objective of mapping the marketing chain and the controls of transactions between buyers and
sellers, in order to identify how and when animals are traded, and how this may be better controlled to reduce FMD risk.

Summary:

Marketing system

1. Differs markedly between east and west Anatolia
2. East: summer fattening system, so that animals are bought when young in the spring markets and fattened on grass, and sold in autumn for winter fattening - mainly in grain production areas in the west
3. West: of note is the winter fattening systems, using animals brought from central and eastern Turkey
4. Seasonality: more local buyers and sellers during the winter. On the other hand, actors in chain increase and show differences in March-April and September-October periods.
5. Animals, in east (Erzurum and Ağrı provinces), are bought by mainly local buyers to fatten in pastures in March-April period.
6. September-October: live animal movement increases, to supply animals for stable fattening in the original place and for movement to the Central Anatolia-West regions

Age of animals at marketing

- Grass fattening system: mostly sold at young ages, bought for pasture fattening during March and April. These animals are fed up till the 9th-10th months and then taken to other provinces to be sold
- Stable fattening: in stables for 6-9 months, then put on market (for purchase by slaughterhouse/butchers).

The above relates mainly to production/fattening and not to breeding stock (heifers, milk cows, breeding sheep) which were not the main focus of the inquiry.

Control of the marketing chain

1. The current system is based on a set of controls that rely upon the clean village principle: if FMD is reported, the village is under a set of restrictions
2. These restrictions act as a disincentive to report FMD as it interferes with normal business
3. Certificate of origin of animals is given by institution of village headman or Mayoralty; local pressure can result in certificates of origin being given to animals that are not suitable, e.g. not based on counts, and to animals without ear-tag or unrecorded.
4. Pre-movement health certificates: animals should have been vaccinated > 15 days before movement, but vaccination 2-3 days before (at giving of certificate) appears to be common. Since this may often be the first vaccination of the animal, the result must be inadequate immunity when exposed to infection during movement and marketing

Control

- the most serious problem is that staffs of Province/District Directorates of Agriculture
cannot exercise controls (apply sanctions for breaches of regulation) in animal markets.  

- some evidence of short term market closures were found, but these were limited compared to the number of clear breaches observed  
- many animal markets are not registered but allowed to continue trading  
- market recording of movements are inadequate, mainly quantitative (or as numbers of entered-left animals) rather than individually recorded  
- inadequate biosecurity features at entry and exit  

Opportunities  

1. vaccination before movement: trading only well vaccinated animals should decrease risk at all points of the movement and marketing system  
2. incentives and enforcement could be based on the animal identification system; recording vaccination status with animal ear tag in Turkvet system  
3. improve performance of data entry into Turkvet, so that delays between entry and access to data in Turkvet do not compromise its use in issuance or checking of certificates  
4. ensure all persons involved in the Inoculation of animals before movement know the importance of the 15 day period for development of immunity  
5. health certificates should then be based on vaccination status recorded in the Turkvet system  
6. controls which are based on legislation but are unsupported by the Provincial administration and by the livestock trading stakeholders will be difficult to implement; but linking permits to animal ID and vaccination requirements could present an opportunity for incentives (free movement of such animals?)  
7. enforcement (checks and penalties at markets....) will be difficult but may be essential to creating incentives for sellers/traders/buyers to trade only well vaccinated animals
Recommendations of the Working group:

- Group 4 identified the critical control points, and options and key recommendations (Appendix ...)

- Critical Control Points:
  - Enterprise standards: To be living place for animals from birth to slaughter (registration, vaccination, transport, dealers, application of biosecurity measures and others)
  - Institutional Processes: Origin of certificate, application of eartag, Veterinary Health Certificate, disinfections, passport, application of vaccine etc...
  - Animal Market controls: legal situation, physical conditions, control-registration-inspection, actors in the markets
  - Slaughterpoints: Slaughterhouses and abattoirs, integrations system, inspection and entry control

- Current performance of the FMD reporting, disease confirmation and response system: analysis of time intervals from FMD occurrence to response

Dr Zafer Zog presented an analysis of the functional performance of overall system of diagnosis of FMD outbreaks; the issue had arisen from the uncertainty of the situation with type A distribution,
arising from the high ratio of untyped to typed outbreaks in 2007. (Appendix „„), and because of the long delay to confirm FMD in Thrace in autumn 2007.

[An approach to identify the level of under-reporting was also discussed following the presentation of Tom Murray (Appendix ...), which would use a comparison of sero-surveillance indicators and standardised incidence.]

Summary:

1. the period from first clinical sigs to sampling by an official vet was 5 days on average, and response of official veterinarians to outbreak notification was very good, with the usual response being to visit/sample on the same day

2. under-reporting is a known problem, but the level of this can only be estimated indirectly (by serology). Much consideration needs to be given to improve reporting of suspected FMD outbreaks to local official veterinarians.

3. Time from arrival of samples to SAP Institute to laboratory diagnosis is 7 days in average. Records show that this time can be as long as 25 days. More concerns should be given to shorten this time.

4. Time from occurrence of outbreak to laboratory diagnosis is average 13 days. Result show this duration can be 61 days in some cases. It was expected that it will be between 12-14 days.

5. There is need to monitor the speed of the diagnostic system regularly; but the performance indicators need to be agreed as the TURKVET database and SAP Institute sample data are not complete and were found to have data entry errors.

6. The current performance is useless for early detection and specific reaction to new threat (e.g. Asia-1 or new type A outbreaks), as 14 days allows for widespread movement of infection.

7. The current performance is only be helpful for monitoring trends, not for direction of specific
measures where the virus type is required, such as eradication of pockets of infection.

Recommendations (of the FAO lead consultant, Dr Zog)
R#1: Performance of reporting system should be monitored regularly.
R#2: National FMD steering committee should regularly monitor the delay periods:
   - first signs to sample collection
   - sample collection to confirmation
   - % untyped outbreaks that have had follow-up sampling to confirm or rule out FMD
R#3: TURKVET database should include data on tracing of sample and feedback to local veterinarians.
R#4: Data needed to monitor and to evaluate performance of response to disease and reporting should be defined and collected.
R#5: Training of related parties (animal owner, head of village, village elders council, private practitioner, staff at municipalities and public) on importance of reporting suspected FMD case as soon as seen, is necessary.

Summary of the Working Group report

Working group 1 addressed issues in the performance of the reporting/diagnostic system (Appendix ...).

In addition to the above recommendations, they recommended:

1. Using rapid field test by local official veterinarians could be supportive in the diagnosis of FMD as well as selecting appropriate sample to send for typing to SAP Institute. We should explore how this technology may help in Turkey.
2. Laboratory based real time RT-PCR should be developed in the SAP Institute. Data from these assays can be used to provide rapid detection (and possible characterization) of field strains of FMDV.
3. The TURKVET Sample Tracing System should be used and coordinated (with SAP Institute and other labs) to provide necessary data for laboratory and field staff.

•Managing the performance of FMD control: sero-monitoring and information required by the FMD Steering Committee to monitor improvements in the prevention of FMD outbreaks and response to new events

Recommendations:
1. It should be established a functional epidemiology centre at the GDCP (and FMD Institute under the this body) with well trained experts and equipments which will be used data analysing in order to facilitate following actions at least:
   a. design surveillance and serosurveillance
   b. analysis and interpretate data generated from those activities
   c. maintain risk assessment analysis and early warning systems using all data and circumstances
   d. drive contingency plan and new policies and actions
   e. organize dynamic training course for field vet cervices
   f. produce reports for monitor progresses

2. At the national level, a well structured database should be maintained used the information which is from outbreak information data (TURKVET), vaccination coverage, outbreak investigation activitie as passive and active disease survey (clinical) activities and serosurveillance activities. Those source should be driven by the epi centre defined at item1 and submitted to steering committee, task force and GDCP as well,

3. It should be produced a progressing report twice a year in order to monitor project output and define new policies and strategies

6. New approaches to the issues of FMD incidence, distribution and mode of spread in Turkey
   - Tom
   - Don

7. Outbreak investigations - whose responsibility? future organization, roles, and training (Mustafa Tufan)
   -

8. Final discussions – on Technical issues and Constraints to be addressed
   To add –

Acknowledgement

The participants of the meeting recorded a vote of thanks to Dr Recep Ergul, Director of the SAP Institute, and to the FAO Office in Ankara, for hospitality and the good organisation. Dr Sumption thanked the interpreters for their excellent service, and the FAO national consultants for their good work in preparing the meeting, and the international experts for their inputs. Finally he thanked the GDPC for the excellent spirit of open co-operation in the implementation and review of the work on FMD control, throughout the past 2 years.

List of Appendices:

Appendix 1. List of participants
Appendix 2. Meeting Agenda
Appendix 3 Working Groups
Appendix 4. Working Group conclusions and recommendations
Appendix 5. Papers presented: Overview - Sumption
Appendix 6. FMD Control program in Turkey (GDPC – Askaroglu)
Appendix 7. Lessons learnt – Dr Zog
Appendix 8. Analysis – Tufan
Appendix 9. Sero-surveillance – SAP/Bulut
Appendix 10. Performance of reporting/diagnostic system (Dr Zog)
Appendix 11. Market chain analysis
Appendix 12. Reporting of FMD incidence – Murray
Appendix 13. Molecular epidemiology – relevance of full length sequencing to decision making – Don King/WRL
LIST OF PARTICIPANT

Dr. Visal KAYACIK
Koruma ve Kontrol Genel Müdürlüğü
Hayvan Hastalıkları Mücadele Şube Müdürlüğü
ANKARA
Work Tel: 312-4186317
Mobile : 533-3430630
Fax: 312-4178209
e-mail: visalk@kkgm.gov.tr

Dr. Adil ADIGÜZEL
Koruma ve Kontrol Genel Müdürlüğü
Hayvan Hastalıkları Mücadele Şube Müdürlüğü
ANKARA
Work Tel: 312-4174176/ 4041
Mobile : 533-7934544
Fax: 312-4178209
e-mail: adil@kkgm.gov.tr

Dr. Gülgin KARAĞ DUMAN
MARA
Department of Foreign relations and EU Coordination
ANKARA
Work Tel: 312-2873630/ 214174176/401337
Mobile : 533-4360870
Fax: 312-4178209
e-mail: gkarasduman@gmail.com

Sevgi KARADEMİR
Terim İİ Müdürlüğü
Hayvan Sağlığı Şube Müdürlüğü
ANKARA
Work Tel: 312-3158328
Mobile : 555-4252122
e-mail: sevgi_karademir@hotmail.com

Erol KESER
Terim İİ Müdürlüğü
Hayvan Sağlığı Şube Müdürlüğü
EDİRNE
Work Tel: 284-2352699
Mobile : 532-2047156
Fax: 284-2352697
e-mail: 22@vet.gov.tr

ÖZCAN YILDIRM
Terim İİ Müdürlüğü
Hayvan Sağlığı Şube Müdürlüğü
ARDAHAN
Work Tel: 478-2114639
Mobile: 532-5837124

Appendix 1

Fax: 2478-2114639
e-mail: 75@vet.gov.tr

Dr. Recep ERGÜL
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600/ 114
Mobile : 532-3062569
Fax: 312-2873606
e-mail: recepe@sap.gov.tr

Dr. Gülhan AYNAGÖZ
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600/ 201
Mobile : 505-5789554
Fax: 312-2873606
e-mail: musaa@sap.gov.tr

Müge Firat SARAÇ
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600/ 182
Mobile : 533-4412532
Fax: 312-2873606
e-mail: urakrlshna@yahoo.com

Can ÇOKÇALIŞKAN
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600/ 237
Mobile : 532-3074046
Fax: 312-2873606
e-mail: cancokcaliskan@gmail.com

Beyhan SARAYÜPOĞLU
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600/ 178
Mobile : 538-5057930
Fax: 312-2873606
e-mail: beyha.sar@gmail.com

Fuat ÖZYÖRKÜ
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600/ 277
Mobile : 503-5789554
Fax: 312-2873606
Atanur TEZEL
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600
Mobile: 546-2303924
Fax: 312-2873606
e-mail: atanurtezel@gmail.com

Ahmet İPEK
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600
Mobile: 506-3701259
Fax: 312-2873606
e-mail: ahmet.antalyali@cfcu.gov.tr

Ünal PARLAK
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600
Mobile: 505-7716882
Fax: 312-2873606
e-mail: parunal@gmail.com

Dr. Canan ÖZCAN
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600
Mobile: 535-8678715
Fax: 312-2873606
e-mail: canancool@gmail.com

Dr. Canan ÖZCAN
SAP Enstitüsü
ANKARA
Work Tel: 312-2873600
Mobile: 535-8678715
Fax: 312-2873606
e-mail: canancool@gmail.com

Dr. Ahmet ANThIYALI
CFCU
Work Tel: 312-2954900
Mobile: 505-7686923
Fax:
e-mail: ahmet.antalyali@cfcu.gov.tr

Dr. Ahmet ANThIYALI
CFCU
Work Tel: 312-2954900
Mobile: 505-7686923
Fax:
e-mail: ahmet.antalyali@cfcu.gov.tr

Dr. Ahmet ANThIYALI
CFCU
Work Tel: 312-2954900
Mobile: 505-7686923
Fax:
e-mail: ahmet.antalyali@cfcu.gov.tr

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Melek ÇAKMAK
FAO
Assistant Representative
Work Tel: 312-3079514
Mobile: 533-7345152
Fax:
e-mail: melek.cakmak@fao.org

Mustafa TUFAN
National Consultant
Work Tel: 505-2781281
Mobile: 532-7815930
Fax: 312-4390798
e-mail: mustafatufan60@gmail.com
tufanvet@hotmail.com

İbrahim ÇETİN
National Consultant
Work Tel: Mobile: 505-3706676
Fax: 224-5390579
e-mail: icetin2007@gmail.com

Bülent GÜLCUBUK
Ankara University
Faculty of Agriculture
Department of Agricultural Economics
Work Tel: 312-5961613
Mobile: 533-4805999
Fax: 312-3185360
e-mail: qulcubuk@agri.ankara.edu.tr
bqulcubuk@gmail.com

Donald KING
WRLFMD
Institute for Animal Health
Pirbright, UK
Work Tel: 44-1483231131
Mobile: 44-7796239277
Fax: 44-1483231142
e-mail: donald.king@bbsrc.ac.uk

Yasser BASYOUNI
General Organization for Veterinary Services
Work Tel: 20233361727
Mobile: 20105665720
Fax: 2023336727
e-mail: yaser_gov@yahoo.com

Chairman of the Standing Technical Committee:
Aldo DEKKER
CVI
Lelystad
The Netherland
Work Tel: +31320238603
Mobile: +31320238603
Fax: +31320238668
Workshop Timetable:

25th March

09.30 Opening (GDPC, EC, FAO)
09.45 Project overview and Workshop plan – FAO
FMD Control program in Turkey – Strategy and Plan 2008: (GDPC)

10.00 Why FMD outbreaks occur - Results and lessons learnt from investigations (Zafer Zog)
10.30 Performance of the reporting and response system: analysis of time intervals from FMD occurrence to response (Zafer Zog)
11.00 Outbreak investigations -whose responsibility? future organization, roles, and training (Mustafa Tufan)
11.30 Break
12.00 Analysis of FMD surveillance data (Mustafa Tufan & Ibrahim Cetin)
12.30 Monitoring FMD vaccination and control by sero-surveillance - results of the FMD sero-surveillance in 2007 (Naci Bulut), with focus on Anatolia

13.30 Lunch

14.30 Understanding and influencing livestock markets and marketing of ruminants in Turkey - results of a market chain survey (Bulent Gulcubuk)

15:00 Group work: to identify the key changes needed, and how to monitor progress:

Group 1: FMD reporting – Reducing the time intervals from FMD occurrence to response. This group should also consider the evaluation of penside/bench rapid methods for FMD confirmation.

Group 2: Outbreak investigations
- the key changes that must occur to maintain epidemiological units, enterprises and areas free of FMD
- future organization –who needs the information (local control centres, national), whose responsibility will it be to organise, report and decide on follow up?

Group 3: Sero-surveillance - group should define what information is needed (by the FMD Steering committee, or at province level), to monitor and evaluate the progress of FMD vaccination and control, who should do this, frequency of reports.

Group 4: Market chain analysis: this group should include persons from the Animal Movement Department and consider:
- the critical control points for preventing FMD infection passing through the animal marketing chain?
- the weak points in the current system to prevent this?
- the options to prevent FMD infected animals being traded?
- options or combination of options recommended?
- list also constraints to implementing each option.

19:00 Conference dinner (Kebabistan Meat Restaurant, Resit Galip Cad. No. 58, Gaziosmanpasa, Ankara)

26th March

09.00 - 10.00 Finalization of group work

10.00 What can molecular epidemiology contribute to understand biosecurity failures (why and how outbreaks spread)?
Don King, WRL for FMD, Pirbright
Thoughts on reporting of FMD incidence - to guide national -and local -decision making.
Tom Murray, Ireland (formerly FAO, Rome)
Appendix 3

GROUP WORK

GROUP 1: FMD reporting
Canan ÖZCAN
Müge FIRAT
Sevgi KARADEMİR
M. Zafer ZÖĞ
Yasser BASYOUNI
Donald KING

GROUP 2: Outbreak investigations
Serdar KIZIL
Ahmet İPEK
Mustafa TUFAN
Tom MURRAY
Cihangir GÜMÜŞTEPE
Özcan YILDIRIM

GROUP 3: Sero-surveillance
Aldo DEKKER
Naci BULUT
Beyhan SAREYYUPOĞLU
Can ÇOKÇALIŞKAN
Visal KAYACIK
Carsten PÖTZSCH
Gülşin KARAŞ DUMAN

GROUP 4: Market chain analysis
Bülent GÜLCUBUK
Ünal PARLAK
Kemal YILMAZ
İbrahim ÇETİN
Çagatay ÇEBİ
Fuat ÖZYÖRÜK
Appendix 4

Group 1: FMD Reporting
- group should identify:

1. reasons why reporting of FMD is delayed/does not occur
   - the feasible options to improve reporting:
   - output can be a table
   - with key recommendation for 2008-9

2. delays between reporting and laboratory confirmation
   - who needs to know the results of lab confirmation?
   - how is their work affected by delays?
   - what are reasons for delays?
   - what are the options – and constraints - to reduce the delays?
   - consider if “rapid field tests/penside tests” could play a role
   - output can be a table – type of delay – reason – options to improve - constraint

3. key recommendations for 2008-9

Group 1: outputs

Considering that:
1. There has been delays between the occurrence of disease and reporting to official veterinarians, between reporting and laboratory confirmation.

Conclusions
1. Although the delay between reporting and laboratory confirmation do not effect the work of the official veterinarian to respond to FMD outbreaks in practice, shortening the time from reporting to laboratory confirmation is important for the early detection of a possible new threat. Because of the use of bivalent vaccine in some parts of Turkey, this is bound to become a more important issue in 2008.

2. There are some restrictions like quarantine of animals and animal product in case of FMD outbreaks. Because of those restriction, animal owners at the outbreak are suffering. This remains as one and most important reason of why reporting of FMD outbreaks does not occur. In addition to that the local veterinarians need to be motivated to actively perform routine visit in order to identify FMD outbreaks.

Recommendations
4. Using rapid field test by local official veterinarians could be supportive in the diagnosis of FMD as well as selecting appropriate sample to send for typing to SAP Institute. We should explore how this technology may help in Turkey.

5. Laboratory based real time RT-PCR should be developed in the SAP Institute. Data from these assays can be used to provide rapid detection (and possible characterization) of field strains of FMDV.

6. We should ensure TURKVET Sample Tracing System is widely used and coordinated to provide necessary data for laboratory and field.
Group 2: ToR 1
- group should define
  - the main entry mechanisms for FMD virus into epidemiological units and enterprises (and areas free of FMD)
  - the options for reducing risk to each, with constraints
  - output can be a table (entry mechanism, option, constraint)

Table 1: Risk factors and management options

<table>
<thead>
<tr>
<th>RISK FACTOR</th>
<th>TYPE</th>
<th>REQUIRED IMPROVEMENT</th>
<th>MECHANISM FOR IMPROVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Animal Movement</td>
<td>Legal</td>
<td>Greater Control of Registration and Health Certification</td>
<td>Improve the computerised recording of Vaccination</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Creation of list of Veterinarians for pre-movement inspection of animals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Veterinary Certification of animal Health: farmer chooses Veterinarian</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increase involvement of the chamber of Veterinarians including private veterinarians</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve vaccination status of animals pre-movement.</td>
<td>Ensure Control of Vaccination ;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. High Quality Vaccine</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Stable formulation, effective at point-of-use</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sufficient vaccine</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rapid Emergency Vaccination.</td>
</tr>
<tr>
<td>Decreased Movement</td>
<td>Macro level Policies</td>
<td></td>
<td>Slaughter at origin</td>
</tr>
<tr>
<td>live Animals</td>
<td></td>
<td></td>
<td>More fattening activities in Eastern region</td>
</tr>
<tr>
<td>Control of Movement</td>
<td>Licencing of animal dealers and transporters</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Illegal</td>
<td>Reduce illegal movement</td>
<td>Need institutional cooperation (security forces) (municipalities) (Army)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Make Administrative sanctions effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>registration of dealers</td>
</tr>
<tr>
<td></td>
<td>Natural (Wild Boar)</td>
<td></td>
<td>Cooperation with forestry and environment ministries</td>
</tr>
<tr>
<td>2 Non susceptible animal Movement</td>
<td>eg, cats, dogs, wild birds</td>
<td>Reduce movement</td>
<td>Awareness Raising</td>
</tr>
<tr>
<td>3 Contact Contiguous herds</td>
<td>Common grazing</td>
<td>Minimise contact between susceptible animals and infected animals or premises</td>
<td>Quarantine and isolation of infected herds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>improved management of grazing lands to minimise risk(grazing land commission)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Disinfection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Keep susceptible animals away from infected premises and land.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>common water</td>
<td>Branching of water sources so that animals may not need to drink from same point</td>
<td></td>
</tr>
<tr>
<td>RISK FACTOR</td>
<td>TYPE</td>
<td>REQUIRED IMPROVEMENT</td>
<td>MECHANISM FOR IMPROVEMENT</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------</td>
<td>----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>source</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Human Movement</td>
<td>Farmers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contractor</td>
<td>Control of spread through human movement</td>
<td>Training and awareness raising</td>
</tr>
<tr>
<td></td>
<td>Veterinarians</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dealers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others--shared labour</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Family relations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Weather related</td>
<td>Flooding</td>
<td></td>
<td>Cooperation with meteorology department</td>
</tr>
<tr>
<td></td>
<td>Wind</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Shared equipment</td>
<td></td>
<td></td>
<td>Forbidden during outbreak</td>
</tr>
<tr>
<td>7 Transport vehicles</td>
<td>Animal</td>
<td></td>
<td>Cease movement after the outbreak</td>
</tr>
<tr>
<td></td>
<td>Milk</td>
<td></td>
<td>Controlled movement if movement is necessary</td>
</tr>
<tr>
<td></td>
<td>Feed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Poor communication and information dissemination</td>
<td></td>
<td></td>
<td>Developing early warning systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Notification and reporting of signs of FMD</td>
</tr>
</tbody>
</table>

Group 2: ToR 2:
- future organization of outbreak investigations
  - priorities: which outbreaks - all or selected? if selected, what should be the priorities and who should decide?
  - who needs the report? (provincial/local control centres, national, international)
  - what is the key information of interest for each national vet service level?
  - consider also their options to respond to the findings
  - output can be a table: (level of responsibility, key information needed, follow-up options from the information)

Output:
- recommendations are given in the paper of Dr Tufan (appendix ...)
- the group proposed that outbreak investigation be extended to all provinces of Turkey by end of 2010, following a period in which the task would be undertaken by teams based in the Regional Institutes
- in 2008-9, the group identified that 18 teams, each of 4 persons would be needed
- objectives, budgets and responsibilities need to be defined.

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>Budget</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Budget</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Equipment</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Contingency plans</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- 8 Regional institutes, 2 (outbreak investigation teams) teams from each
- 2 from SAP institute
- 18 teams of four for outbreak investigation
- Teams for all provinces

Information flow charts plus terms of reference identified.
Provincial teams should be in contact with epidemiological units in province and the central office.

Group 2: ToR 3: Key recommendations for action in 2008-9 (not more than 3)
The group did not get time to work further on this element, but produced 3 key “recommendation areas” as below:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Implementation of Laws</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Focus on Human resources</td>
</tr>
<tr>
<td></td>
<td>Quality, Quantity and conditions of work</td>
</tr>
<tr>
<td>3</td>
<td>Public Awareness; Early Warning, Early response</td>
</tr>
</tbody>
</table>
**GROUP 4: MARKET CHAIN ANALYSIS**

**Terms of Reference:**
- what are the critical control points for preventing FMD infection passing through the animal marketing chain?
- the weak points in the current system to prevent this?
- the strategic options to prevent FMD infected animals being traded?
- for each option, the constraints to improvement
- output can be a table
- finally, identify the most feasible improvements in 2008-9?

- the key recommendations (not more than 3)

### The critical control points

<table>
<thead>
<tr>
<th>The critical control points</th>
<th>The weak points</th>
<th>The strategic options</th>
<th>For each option, the constraints to improvement</th>
<th>Recommendations</th>
</tr>
</thead>
</table>

### The key recommendations

**The Critical Control Points:**
- **Enterprise:** To be living place for animals from born to slaughter (registration, vaccination, transport, dealers, application of biosecurity measures and others)
- **Institutional Process:** Origin of certificate, application of eartag, Veterinary Health Certificate, disinfections, passport, application of vaccine etc...
- **Animal Market:** legal situation, physical conditions, control-registration-inspection, actors in the markets
- **Slaughter:** Slaughterhouses and abattoirs, integrations system, inspection and entry control

<table>
<thead>
<tr>
<th>Kritik Kontrol Noktalar</th>
<th>Zayif Noktalar</th>
<th>Stratejik Seçenekler</th>
<th>Seçenekleri Uygulamadaki Kısıtlamalar</th>
<th>Tavsiyeler</th>
</tr>
</thead>
</table>

---
<table>
<thead>
<tr>
<th>1. İşletme</th>
<th>2. Kurumsal İşlemler</th>
</tr>
</thead>
</table>

1. **İşletme:** Hayvanın her aşamada bulunduğu mekan (Doğumundan kesilinceye kadarki süreçte, Hayvanın kaydı, aşları, taşı ($. . .
2. **Kurumsal İşlemler:** Menşe şahadetnamesi, Kulak küpesi uygulaması, Veteriner sağlık raporu düzenlenmesi, dezenfeksiyon, pasaport, aş uygulamaları vb.
3. **Pazar:** Yasal durumu, fiziki koşulları, kontrol-kayıt-denetimi, pazardaki aktörler
4. **Kesim:** Mezbaha ve kombinalar, entegre işletmeler, giriş kontrolleri ve muayeneleri

**KKN:**
- **İşletme:** Hayvanın her aşamada bulunduğu mekan (Doğumundan kesilinceye kadarki süreçte, Hayvanın kaydı, aşları, taşı ($. . .
- **Kurumsal İşlemler:** Menşe şahadetnamesi, Kulak küpesi uygulaması, Veteriner sağlık raporu düzenlenmesi, dezenfeksiyon, pasaport, aş uygulamaları vb.
- **Pazar:** Yasal durumu, fiziki koşulları, kontrol-kayıt-denetimi, pazardaki aktörler
- **Kesim:** Mezbaha ve kombinalar, entegre işletmeler, giriş kontrolleri ve muayeneleri