EU veterinary emergency team - Mission on FMD in Bulgaria 17-21 Jan 2011

Keith Sumption (team leader); Klaus Depner (team member); Silvia Bellini (team member)

1. Based on reported information, a timeline was developed leading to the working hypothesis that foot and mouth disease (FMD) occurred in wildlife before infection of domestic pigs in Kosti.

2. Entry of infection to Kosti (IP1):
   - based on lesions (pig) observed by NVS on 7 Jan 2011.
   - 5 NSP antibody positive pigs in group
   - feeding practise encouraged domestic free range pigs and wild boar to use same ground/feeding area
   - subsequent spread presumed to occur at common grazing with village flock.

3. Primary infection:
   Primary infection in Bulgaria is more of a mystery; this could have been through infected wild boar entering Bulgarian territory or by infection of domestic pigs or wild boar through access to food waste contaminated with foot and mouth disease virus (FMDV). The team could not conclude which is more likely at this point.

4. The extent of infection in the wild boar population is unknown, as is the duration of the sylvatic epidemic, and the involvement of other susceptible wild species in this area (3 deer species and moufflon).

5. Should the entry mechanism be an undetected epidemic in wild boar in Turkish Thrace, then introductions may occur at other points along the border, or spread silently in the wild population in this region of Bulgaria.

6. International attention and concern will remain as long as there is a plausible risk, or perception, of continuous FMD in wild populations spanning the woodland ecosystem on both sides of the border.

7. Proof of absence of circulation in wild boar will be difficult, and may require to wait until evidence that animals born since the last detected viral positive (in domestic or wild species) are antibody negative, in other words may rely on sampling and testing piglets over 3 months of age (to rule out positives from maternal antibody).

8. The wild boar programme, on both sides of the border, will be required for at least 3 months, and possibly a year to acquire evidence that circulation has ceased, and surveillance in other species may also be needed to satisfy scientific opinion that circulation has not occurred or has ceased.
9. The risk of reintroduction to domestic animals (pigs) could occur through meat/tissues from wild boar shot in autumn 2010 in the high-risk areas.

10. On the observed control measures:
The control measures of greatest significance in this situation are considered to be:
• quarantine/biosecurity measures to prevent spread within and outside of the Protection Zone;
• culling/disposal of animals in infected groups/premises;
• surveillance to achieve early detection of new cases in domestic (and wildlife).
• quarantine/biosecurity and culling/disposal.

11. Factors favouring quarantine/biosecurity as a control measure to contain infection are:
• the distance between villages
• the lack of human population between villages, limiting traffic
• single tarmac road access to Kosti and Resovo
• no dairy tankers, feed lorries etc to the husbandry systems
In principle this leads to highly favourable situation for containment of the infection.

12. Against the said in 11 (Negative factors) are:
• lack of precise numbers of animals
• free range husbandry system, lack of feed for animals if enclosed, therefore orders to enclose create difficulties
• lack of animal holding facilities, making surveillance, and culling operations extremely difficult
• culling at animals in woodland settings, leading to contamination
• difficulty to maintain operational biosecurity of veterinary culling teams through wild nature of animals, lack of handling facilities, and operations in open/woodland locations
• lack of familiarity of teams with the practices to manage the exceptional infectiousness of FMDV

13. Observations
Given the extent of acute infections (Hereford herd in Kosti; Resovo) the greatest risk must be from the control operations.
• In this situation, culling more than 24 hours after 1st signs confirmed (and more than 7 days after earliest lesion), and especially if animals are enclosed for several days before killing, creates conditions for explosive intra-herd virus amplification and risk of inter-herd spread.
• Control operations where more than 50 per cent of animals have early lesions is extremely hazardous: every animal is a potent source of virus for spread.
• Culling and disposal teams biosecurity - a major concern

14. Additional risks arising:
• contamination of ground by animals before and after culling;
• wild boar/wildlife access to carcasses and contaminated ground;
• risk of infectious FMDV remaining on the sites of the control operations;
• Together with risks of infection in the wild population = repopulation risk.

15. Summary ¬ control measures:
The principles of all control and eradication measures laid down in the EC Directives were followed, but it is undoubtedly difficult to apply.

16. Irrespective of the available disposal capacity, culling of infected groups must take place within 48 hours to prevent rapid amplification in the group, and greater effort must be given to achieving this.

17. On vaccination: Given the potential for re-infection from the contaminated environment and infected wild animals remains, vaccination strategies should be considered.
• Decision points should be agreed in advance, for example based on the rate or location of new cases and evidence of spread in wildlife.
• Vaccination plans should be prepared (as a Back-up Plan), with all major issues resolved in advance concerning application, post-vaccination surveillance, and stakeholder acceptance.
18. On surveillance in domestic population:
- Sero surveillance attention should be given to high risk backyard pig holdings/forest access situations in the adjacent bordering districts.

Recommendation
• In addition to requirements of the Directive, extend the surveillance programme to focus upon high risk backyard pig holdings in the adjacent bordering municipalities.
• Prepare to review and revise sero-surveillance plans after results of the wildlife surveillance, since high risk zones may change.

19. Conclusions
On FMD in wild boar: It cannot be concluded if wild boar has been the source of the infection or secondarily infected (victim of the infection).

Other wild species which may be infected are present in the forests, in total number exceeding the wild boar [deer -- red, roe and fallow, and moufflon].

Conclusion and recommendations:
As long the role of wild boar is not clear, it has to be assumed that the wild boar population [and other species] might be infected, representing a source of infection for farm animals.

Actions:
• Test all the samples collected from wild boar in 2010 in the affected area;
• Develop/implement surveillance plan for wild boar/wildlife;
• High priority must be given to WB trapping/hunting to achieve information on the "status" of infection of wild boar.
• Tissue testing for virus can be used to detect infection in the past month, and antibody for infections >1 month previously;
• Experimental studies in wild boar with the present virus strain would assist to define duration of infection and optimize diagnostic procedures.

20. Cooperation with the Government of Turkey on FMD management:
Productive meeting on 20 Jan 2011 (Bulgaria/Turkey), obtained agreement on:
• Communication (Daily, Weekly);
• Surveillance in wild boar on both sides (trapping in BG, licensed hunting for sampling collection only in Turkey);
• Joint meetings with the Turkish authorities to discuss results are encouraged, following the 1st round of surveillance to the end of the Turkish hunting program (15 Feb 2011);

Turkey indicated set of control measures (markets closed, re-vaccination in border districts, sero surveillance program covering all Turkish Thrace).


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Communicated by: Sabine Zentis and Gut Laach
52385 Nideggen, Germany

[Subscribers are encouraged to visit the 29-slide presentation, which includes maps, timelines, and additional information. A new Bulgarian presentation has also been presented and discussed at the SCFCAH meeting; available online at <http://ec.europa.eu/food/committees/regulatory/scfcah/animal_health/presentations/01022011_FM_D_bulgaria_en.pdf>.

Results of a renewed surveillance in Turkish Thrace, with special reference to sheep and wild boars, is anticipated with great interest. - Mod.AS]
Foot and mouth disease - Bulgaria

The FAO/OIE/DEFRA Reference Laboratory for FMD at the Institute for Animal Health (UK) has determined the full genome sequence for a representative serotype O FMDV isolate recovered from the recent outbreaks of FMD that have occurred in Bulgaria. Since the end of December 2010, 3 cases of FMD have been reported in south eastern Bulgaria, close to the border with Turkish Thrace. VP1 sequence analysis on samples received from the 1st case of FMD in Bulgaria in a wild boar was carried out at the IAH and showed that the virus belongs to the Middle East-South Asia (ME-SA) topotype (PanAsia-2 lineage, ANT-10 sub-lineage) and is closely related to viruses found in Turkey and Iran (sharing nucleotide identities of over 99 per cent; <http://www.wrlfmd.org/fmd_genotyping/euro/bul.htm>). Our studies have shown that the ANT-10 sub-lineage of the PanAsia-2 lineage (which was derived from the earlier PanAsia lineage) has recently become widespread in Afghanistan, Iran, Pakistan and Turkey. [Map at <http://www.zonu.com/images/0X0/2009-09-17-603/Southwest-Asia-Political-Map-1996.jpg&imgrefurl=>].

A full genome sequence (8180 nucleotides excluding the poly-A tail) was generated from viral RNA extracted from an epithelial lesion collected from a wild boar that was shot in the Burgas region of Bulgaria on 30 Dec 2010. This sequence (draft GenBank submission) can be found at <http://www.wrlfmd.org/fmd_genotyping/bulgaria_2011.htm>. The full genome sequence of a closely related virus isolated from an outbreak in Turkey is currently being determined at the IAH for comparative purposes.

During previous FMD outbreaks in the UK (2001 and 2007), full genome sequence data have been used to reconstruct transmission pathways at the farm-to-farm level: for examples see Cottam et al. (2006) and Cottam et al. (2008). This approach could now be used to support epidemiological investigations that are being conducted to understand the spread of the virus to, and within, Bulgaria.

Further information, including detailed laboratory RT-PCR protocols used to generate this sequence, can be obtained from the [following contacts at] WRLFMD:<begona.valdazo-gonzalez@bbsrc.ac.uk>, <nick.knowles@bbsrc.ac.uk>, <jef.hammond@bbsrc.ac.uk>, or <donald.king@bbsrc.ac.uk>.

References:

[byleine: Begona Valdazo-Gonzalez, Nick Knowles, Jef Hammond and Donald King, OIE/FAO Reference Laboratory for FMD (WRLFMD), Institute for Animal Health, Pirbright, United Kingdom]
[According to the above information, for which ProMED-mail is grateful to IAH, the same strain which has been identified in Bulgaria (ANT-10 sub-lineage of the PanAsia-2 lineage), has been spreading in Afghanistan, Iran, Pakistan and Turkey.

A look at the map (<http://www.zonu.com/images/0X0/2009-09-17-603/Southwest-Asia-Political-Map-1996.jpg> will reveal that at least one additional country, bordering both Iran and Turkey, deserves to be included in the surveillance, namely Iraq.

Iraq has been involved in all Near-Eastern FMD panzootics since 1950, leading to the decision to establish (in Dora, near Baghdad) an advanced, well-equipped FMD vaccine producing facility. The laboratory, inaugurated in 1981, went out of use following the gulf war. - Mod.AS]

[see also:
Foot & mouth disease - Bulgaria (11): (BR) 3rd focus, OIE 20110201.0373
Foot & mouth disease - Bulgaria (10): (BR) 3rd focus susp 20110131.0369
Foot & mouth disease - Bulgaria (09): (BR) update 20110120.0236
Foot & mouth disease - Bulgaria (08): (BR) 2nd focus, OIE 20110118.0213
Foot & mouth disease - Bulgaria (07): (BR) 2nd focus conf. 20110117.0200
Foot & mouth disease - Bulgaria (06): (BR) 2nd focus susp 20110116.0190
Foot & mouth disease - Bulgaria (05): (BR), genotype 20110112.0144
Foot & mouth disease - Bulgaria (04): (BR) stock, st O, OIE 20110111.0125
Foot & mouth disease - Bulgaria (03): (BR) bovine 20110110.0120
Foot & mouth disease - Bulgaria (02): (BR), wild boar, conf. 20110107.0091
Foot & mouth disease - Bulgaria: (BR), wild boar, RFI 20110105.0046]