FAO/OIE Reference Laboratory Report
July-September 2007

Foot-and-Mouth Disease

FMD Trends

Summary
This reporting period has been dominated by outbreaks of FMD in **United Kingdom**. FMD was initially confirmed on 3rd August 2007 in beef cattle in Normandy, Surrey. Subsequently 8 premises (11 holdings) were found to have animals that were infected by FMDV. These outbreaks occurred in two distinct clusters located around Normandy and Egham in Surrey separated in time by 36 days. Nucleotide sequencing has shown that the FMD virus responsible for these outbreaks is derived from O1/BFS 1860; an isolate used as a reference and vaccine strain at the Institute for Animal Health and Merial Animal Health Ltd located on the Pirbright site. Furthermore, analysis of full-genome sequence data has been used to demonstrate that outbreaks near Egham (IP3-IP8) were derived from infection via the Normandy cluster (IP1 and IP2), and not through a separate escape from the Pirbright site that reintroduced the virus into the field. Investigations have been undertaken to determine the most likely source of these outbreaks: the results from these independent enquiries have been published separately and their findings are available from the following websites:
HSE report: http://www.hse.gov.uk/news/archive/07aug/footandmouth.htm
Spratt Report: http://www.defra.gov.uk/animalh/diseases/fmd/investigations/pdf/spratt_final.pdf

The following information was collated from OIE (http://www.oie.int/wahid-prod/public.php?page=home), Promed (http://www.promedmail.org/) and the FMD news service at UC Davis (http://fmd.ucdavis.edu/).

Outside of the UK, no outbreaks were officially reported in FMD-free countries that did not practice vaccination between July and September 2007. A new outbreak of type O was reported in European Turkey close to Bulgaria. Cattle in a single village in the district of Kirklareli were infected due to illegal animal movements from Anatolian Turkey. Animals in this region are regularly vaccinated and emergency vaccination was also applied. No subsequent outbreaks have been reported. Elsewhere in the Mediterranean basin, 5 new FMD outbreaks affecting 4 sheep and 1 goat herd in the **Palestinian Territory** have been reported to the OIE. In common with previous outbreaks in the region, FMDV serotype O has been identified as the causative agent. [**UPDATE:** Further outbreaks of FMD due to serotype O have been reported recently in **Egypt** (October 2007) and in **Cyprus** (Late October 2007). Sequence analysis of Egyptian viruses is underway and will be presented in the next report: preliminary analysis indicates that these viruses belong to the new PanAsia lineage that has recently spread through the Middle East. An outbreak of SAT1 occurred in North West Botswana (October 2007) in a region where vaccination is routinely practised and the outbreak has been attributed to contact with wildlife following flood damage to fencing.].

In early July, **China** reported a further outbreak of FMD in Qinghai province due to serotype Asia 1. Fifty cattle (yaks) showed clinical signs and the outbreak was controlled by slaughtering 107 cattle and disinfection. In August 2007, FMD outbreaks occurred in **Bhutan** affecting 5 five gewogs of Bardo, Goshing, Nangkor, Phangkhar and Shingkhar in Zhemgang. Material from some of these cases has been received at the WRL and has been typed as serotype O (molecular characterisation of these isolates is underway and it is anticipated that this information will be described in the next report). In **India**, an outbreak of FMD (serotype O) affected a zoo in Thiruvananthapuram in July 2007. High mortality in Indian Gaur (*Bos Gaurus*) and blackbucks was observed. In **Vietnam**, further FMD outbreaks affecting cattle, buffaloes, pigs and goats have occurred (June-July 2007) in the central province of Quang Tri due to serotype Asia 1. The worst-hit area was Dakrong with over 470 out of 650 animals contracting the disease. In August, FMD spread to Can Tho city in the Mekong Delta, although the relationship of these outbreaks to earlier cases is not clear. Elsewhere in Southeast Asia, there have also been reports of FMD outbreaks in **Myanmar** close to Rangoon.

In Africa, the OIE has re-instated FMD free zones, without vaccination to all the zones in **Botswana** except zone 7 (Bobonong and Selebi-Phikwe area).

In South America, vaccination covering 96% of the local cattle population has been used to control the earlier outbreaks of FMD due to serotype O (in Tigrillo, Manabi, **Ecuador**). In July, there were new reports of an FMD outbreak (due to serotype O) in north-west **Venezuela** (Zulia), about 60 km from the Colombian border. Furthermore during September 2007 additional cases of FMD were reported in Piar, Bolivar in the east of the country. In central Venezuela, the second round of mass vaccination of 2007 in Yaracuy will start in October. During the first round 91.5% of the 38,315 cattle in the state were FMD vaccinated. FMD mass vaccination campaigns are continuing in Paraguay, in the Brazilian State of Goias and in the Argentine province of Entre.

The WRL vaccine recommendations remain unchanged although O1 Manisa appears to have only a moderate match against the current O PanAsia strains circulating in the Middle East and a potency test is scheduled to examine the cross-protection afforded in vivo.

Results from samples received to WRL (status of samples being testing is shown in Table 1)

An up-to-date list and reports of FMD viruses characterised by sequencing can be found at the following website: http://www.wrlfmd.org/fmd_genotyping/2007.htm

Europe

FMDV serotype O
VP1 and full-genome sequencing has been performed on viruses recovered from all the infected premises from the FMD outbreak in United Kingdom. These viruses are all closely related to each other and derived from O1/BFS 1860 (see Annex 2, Figure 1).

Africa

FMDV serotype O
Sequencing of an FMDV serotype O isolate from Uganda showed that it was most closely related to other FMD viruses from Uganda (collected in 2004) within the East Africa-2 topotype (see Annex 2, Figure 2).

Middle East

FMDV serotype O
Three FMDV isolates from Yemen have been sequenced belonging to the East-Africa-3 topotype (see Annex 2, Figure 3). 17 serotype O isolates collected during 2007 have also been characterised from Turkey (see Annex 2, Figure 4). This analysis showed that they were all from the new PanAsia lineage widely circulating through the Middle East and south Asia.

FMDV serotype A
Eight serotype A viruses have also been characterised from Turkey (from 2007). All belong to the IRN-05 lineage (see Annex 2, Figure 5).

Table 1: Status of sequencing of samples received recently to WRLFMD

Batch	Country	Serotype	No. of samples	Status
WRLFMD-2007-00019	Pakistan	O	43	in progress
WRLFMD-2007-00021	Uganda	O	1	completed
WRLFMD-2007-00023	Turkey	O	17	completed
WRLFMD-2007-00023	Turkey	A	8	completed
WRLFMD-2007-00045	Yemen	O	3	in progress

Vaccine matching

Three isolates (O UKG 7, 9, 11/2007) from 2007 FMD outbreak in UK were antigenically analysed for type O vaccine matching to provide advice on the vaccine selection should the emergency vaccination strategy used. As expected from the sequence data, the results from two dimensional VNT showed that these field strains were closest matched to O BFS, O Campos , O Lausanne and O kaufbeuren vaccine strains, and also relatively matched to O Manisa vaccine strain (Annex 1; TABLE C).

Twenty one FMDV type O isolates (O Eth 21, 27 and 43/2006, O AFG 29, 34, 36, 37, 39, 42, 43, 45/2007; O PAK 7, 20, 48 and 50/2007 and O TUR 11,13, 29 and 30/2007) from Ethiopia, Afghanistan, Pakistan and Turkey collected in 2006 and 2007 were further characterised by two dimensional virus neutralisation test (Annex 1; TABLE C), showing that most of these isolates were antigenically matched with O1 Manisa vaccine strains and indicating that the currently predominant type O virus can be covered by a vaccine present in many vaccine banks. Four field isolates received from Vietnam (1, 3, 11 and 12/2007) along with two of above isolates (O PAK 20/2007 and O TUR 13/2007) have showed antigenic matching to O Ind R2/75 vaccine strain.

Nine FMDV type A isolates (A AFG 7 and 44/2007; A Vit 8 and 18/2005; A Eth 6/2006; A Mai 12 and 16/2006 and A Sud 1 and 3/2006) from Afghanistan, Vietnam, Ethiopia, Mali and Sudan have been antigenically analysed by VNT and LPBE. The results showed that only two isolates from Vietnam provide some match to A22 vaccine strain; the rest failed to match to either A22 or A Ind 17/82 strains. Four isolates from Ethiopia, Mali and Sudan showed antigenic matching to A Eritrea vaccine strain (Annex 1; TABLE C).

Publication of data to the scientific community and the industry

FMD papers published in the reporting period from the Pirbright Laboratory (Pirbright authors underlined):

1. Zhang Z, Ahmed R, Paton D, Bashiruddin JB. Cytokine mRNA responses in bovine epithelia during foot-and-mouth disease virus infection.Vet J. 2007 Oct 5; [Epub ahead of print]

2. Parida S, Fleming L, Oh Y, Mahapatra M, Hamblin P, Gloster J, Doel C, Gubbins S, Paton DJ. Reduction of foot-and-mouth disease (FMD) virus load in nasal excretions, saliva and exhaled air of vaccinated pigs following direct contact challenge. Vaccine. 2007 Sep 17; [Epub ahead of print]

3. Cox SJ, Parida S, Voyce C, Reid SM, Hamblin PA, Hutchings G, Paton DJ, Barnett PV. Further evaluation of higher potency vaccines for early protection of cattle against FMDV direct contact challenge. Vaccine. 2007 Nov 1;25(44):7687-95. Epub 2007 Aug 24.

4. Vannier P, Capua I, Le Potier MF, Mackay DK, Muylkens B, Parida S, Paton DJ, Thiry E. Marker vaccines and the impact of their use on diagnosis and prophylactic measures. Rev Sci Tech. 2007 Aug;26(2):351-72.

5. Gloster J, Doel C, Gubbins S, Paton DJ. Foot-and-mouth disease: Measurements of aerosol emission from pigs as a function of virus strain and initial dose. Vet J. 2007 Sep 7; [Epub ahead of print]

6. Parida S, Fleming L, Gibson D, Hamblin PA, Grazioli S, Brocchi E, Paton DJ. Bovine serum panel for evaluating foot-and-mouth disease virus non-structural protein antibody tests. J Vet Diagn Invest. 2007 Sep;19(5):539-44.

7. Goris N, Praet N, Sammin D, Yadin H, Paton D, Brocchi E, Berkvens D, De Clercq K. Foot-and-mouth disease non-structural protein serology in cattle: Use of a Bayesian framework to estimate diagnostic sensitivity and specificity of six ELISA tests and true prevalence in the field. Vaccine. 2007 Oct 10;25(41):7177-96. Epub 2007 Aug 2.

8. Mahapatra M, Aggarwal N, Cox S, Statham RJ, Knowles NJ, Barnett PV, Paton DJ. Evaluation of a monoclonal antibody-based approach for the selection of foot-and-mouth disease (FMD) vaccine strains.Vet Microbiol. 2007 Jun 28; [Epub ahead of print]

9. Blomstrom AL, Hakhverdyan M, Reid SM, Dukes JP, King DP, Belak S, Berg M. A one-step reverse transcriptase loop-mediated isothermal amplification assay for simple and rapid detection of swine vesicular disease virus. J Virol Methods. 2007 Oct 5; [Epub ahead of print]

10. Nordengrahn A, Gustafsdottir SM, Ebert K, Reid SM, King DP, Ferris NP, Brocchi E, Grazioli S, Landegren U, Merza M. Evaluation of a novel proximity ligation assay for the sensitive and rapid detection of foot-and-mouth disease virus. Vet Microbiol. 2007 Aug 21; [Epub ahead of print]

11. Watson M, Dukes J, Abu-Median AB, King DP, Britton P. DetectiV: visualization, normalization and significance testing for pathogen-detection microarray data. Genome Biol. 2007 Sep 14;8(9):R190 [Epub ahead of print]

12. Lau LT, Reid SM, King DP, Lau AM, Shaw AE, Ferris NP, Yu AC. Detection of foot-and-mouth disease virus by nucleic acid sequence-based amplification (NASBA).Vet Microbiol. 2007 Jul 14; [Epub ahead of print]

13. King DP, Montague N, Ebert K, Reid SM, Dukes JP, Schadlich L, Belsham GJ, Lomonossoff GP. Development of a novel recombinant encapsidated RNA particle: Evaluation as an internal control for diagnostic RT-PCR. J Virol Methods. 2007 Aug 27; [Epub ahead of print]

14. Ryan E, Horsington J, Durand S, Brooks H, Alexandersen S, Brownlie J, Zhang Z. Foot-and-mouth disease virus infection in young lambs: Pathogenesis and tissue tropism.Vet Microbiol. 2007 Sep 12; [Epub ahead of print]

15. Perkins J, Parida S, Clavijo A. Evaluation of Multiplexed Foot-and-Mouth Disease Non-structural Protein Antibody assay Against Standardized Bovine Serum Panel. Clin Vaccine Immunol. 2007 Oct 3; [Epub ahead of print]

16. Zhong J, Li Y, Zhao S, Liu S, Zhang Z. Mutation pressure shapes codon usage in the GC-Rich genome of foot-and-mouth disease virus. Virus Genes. 2007 Sep 1; [Epub ahead of print]

Annex 1.

Table A: Summary of clinical sample diagnostics made by the WRL between July - September 2007

Country	WRL for FMD Sample Identification	Animal	Date of Collection	Results		
				VI/ELISA	RT-PCR	Final report
NORTH KOREA	NKR 2/2007	Cattle	00.00.07	Asia 1	Positive	Asia 1
TURKEY	TUR 1/2007	Cattle	01.01.07	O	Positive	O
	TUR 2/2007	Cattle	02.01.07	A	Positive	A
	TUR 3/2007	Cattle	02.01.07	O	Positive	O
	TUR 4/2007	Cattle	04.01.07	O	Positive	O
	TUR 5/2007	Cattle	12.01.07	A	Positive	A
	TUR 6/2007	Cattle	23.01.07	O	Positive	O
	TUR 7/2007	Cattle	23.01.07	A	Positive	A
	TUR 8/2007	Cattle	01.02.07	A	Positive	A
	TUR 9/2007	Cattle	04.02.07	O	Positive	O
	TUR 10/2007	Cattle	05.02.07	A	Positive	A
	TUR 11/2007	Cattle	13.02.07	O	Positive	O
	TUR 12/2007	Cattle	23.02.07	A	Positive	A
	TUR 13/2007	Cattle	25.02.07	O	Positive	O
	TUR 14/2007	Cattle	26.02.07	O	Positive	O
	TUR 15/2007	Cattle	01.03.07	O	Positive	O
	TUR 16/2007	Cattle	08.03.07	O	Positive	O
	TUR 17/2007	Cattle	13.03.07	NVD	Positive	FMDV GD
	TUR 18/2007	Cattle	15.03.07	O	Positive	O
	TUR 19/2007	Cattle	19.03.07	NVD	Positive	FMDV GD
	TUR 20/2007	Goat	23.03.07	O	Positive	O
	TUR 21/2007	Sheep	26.03.07	NVD	Negative	NVD
	TUR 22/2007	Sheep	26.03.07	NVD	Positive	FMDV GD
	TUR 23/2007	Sheep	27.03.07	O	Positive	O
	TUR 24/2007	Cattle	02.04.07	A	Positive	A
	TUR 25/2007	Cattle	06.04.07	A	Positive	A
	TUR 26/2007	Cattle	09.04.07	NVD	Positive	FMDV GD
	TUR 27/2007	Cattle	19.04.07	O	Positive	O
	TUR 28/2007	Cattle	24.04.07	O	Positive	O
	TUR 29/2007	Cattle	26.04.07	O	Positive	O
	TUR 30/2007	Cattle	02.05.07	O	Positive	O
UGANDA	UGA 1/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 2/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 3/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 4/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 5/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 6/2007	Cattle	09.03.07	NVD	Positive	FMDV GD
	UGA 7/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 8/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 9/2007	Cattle	09.03.07	NVD	Negative	NVD
	UGA 10/2007	Cattle	10.03.07	NVD	Negative	NVD
	UGA 11/2007	Cattle	10.03.07	NVD	Negative	NVD
	UGA 12/2007	Buffalo	04.04.07	NVD	Negative	NVD
	UGA 13/2007	Buffalo	04.04.07	NVD	Negative	NVD

	UGA 14/2007	Buffalo	04.04.07	NVD	Negative	NVD
	UGA 15/2007	Buffalo	04.04.07	NVD	Negative	NVD
	UGA 16/2007	Buffalo	04.04.07	NVD	Negative	NVD
	UGA 17/2007	Cattle	24.04.07	NVD	Positive	FMDV GD
	UGA 18/2007	Cattle	24.04.07	O	Positive	O
	UGA 19/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 20/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 21/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 22/2007	Cattle	24.04.07	NVD	Positive	FMDV GD
	UGA 23/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 24/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 25/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 26/2007	Cattle	24.04.07	NVD	Negative	NVD
	UGA 27/2007	Cattle	18.05.07	NVD	Negative	NVD
	UGA 28/2007	Cattle	18.05.07	NVD	Positive	FMDV GD
	UGA 29/2007	Cattle	18.05.07	NVD	Negative	NVD
	UGA 30/2007	Cattle	18.05.07	NVD	Negative	NVD
	UGA 31/2007	Cattle	18.05.07	NVD	Negative	NVD
UNITED KINGDOM	UKG 7/2007	Cattle	03.08.07	O	Positive	O
	UKG 8/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 9/2007	Cattle	03.08.07	O	Positive	O
	UKG 10/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 11/2007	Cattle	03.08.07	O	Positive	O
	UKG 12/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 13/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 14-16/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 17-18/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 19-21/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 22/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 23/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 24/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 25-26/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 27/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 28-31/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 32/2007	Cattle	03.08.07	O	Positive	O
	UKG 33-34/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 35/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 36/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 37-38/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 39/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 40/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 41-49/2007	Cattle	03.08.07	NVD	Negative	NVD
	UKG 50/2007	Cattle	03.08.07	NVD	Positive	FMDV GD
	UKG 51-66/2007	Cattle	04.08.07	NVD	Negative	NVD
	UKG 67/2007	Cattle	04.08.07	NVD	Positive	FMDV GD
	UKG 68-72/2007	Cattle	04.08.07	NVD	Negative	NVD
	UKG 73-77/2007	Sheep	04.08.07	NVD	Negative	NVD
	UKG 78-79/2007	Cattle	05.08.07	NVD	Negative	NVD
	UKG 80/2007	Cattle	05.08.07	NVD	Positive	FMDV GD
	UKG 81/2007	Cattle	05.08.07	NVD	Negative	NVD
	UKG 82-90/2007	Cattle	06.08.07	NVD	Negative	NVD
	UKG 91/2007	Cattle	06.08.07	O	Positive	O
	UKG 92/2007	Cattle	06.08.07	O	Positive	O
	UKG 93/2007	Cattle	06.08.07	O	Positive	O

UKG 94/2007	Cattle	06.08.07	O	Positive	O
UKG 95/2007	Cattle	06.08.07	O	Positive	O
UKG 96/2007	Cattle	06.08.07	O	Positive	O
UKG 97/2007	Cattle	06.08.07	O	Positive	O
UKG 98/2007	Cattle	06.08.07	O	Positive	O
UKG 99/2007	Cattle	06.08.07	O	Positive	O
UKG 100/2007	Cattle	06.08.07	O	Positive	O
UKG 101/2007	Cattle	06.08.07	O	Positive	O
UKG 102/2007	Cattle	06.08.07	O	Positive	O
UKG 103/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 104/2007	Cattle	07.08.07	NVD	Positive	FMDV GD
UKG 105/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 106-107/2007	Cattle	07.08.07	O	Negative	O
UKG 108-110/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 111/2007	Cattle	07.08.07	NVD	Positive	FMDV GD
UKG 112-123/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 124/2007	Cattle	07.08.07	O	Positive	O
UKG 125/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 126/2007	Cattle	07.08.07	O	Positive	O
UKG 127-130/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 131-132/2007	Cattle	07.08.07	O	Positive	O
UKG 133/2007	Cattle	07.08.07	O	Negative	O
UKG 134-135/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 136/2007	Cattle	07.08.07	NVD	Positive	FMDV GD
UKG 137-143/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 144/2007	Cattle	07.08.07	O	Positive	O
UKG 145/2007	Cattle	07.08.07	NVD	Positive	FMDV GD
UKG 146/2007	Cattle	07.08.07	O	Negative	O
UKG 147-149/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 150/2007	Cattle	07.08.07	O	Positive	O
UKG 151-157/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 158/2007	Cattle	07.08.07	O	Positive	O
UKG 159-160/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 161-172/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 173-174/2007	Cattle	07.08.07	NVD	Negative	NVD
UKG 175/2007	Sheep	08.08.07	NVD	Negative	NVD
UKG 176/2007	Goat	08.08.07	NVD	Negative	NVD
UKG 177-179/2007	Goat	08.08.07	NVD	Negative	NVD
UKG 180/2007	Sheep	08.08.07	NVD	Negative	NVD
UKG 181-187/2007	Sheep	08.08.07	NVD	Negative	NVD
UKG 188-197/2007	Sheep	08.08.07	NVD	Negative	NVD
UKG 198/2007	Cattle	08.08.07	NVD	Negative	NVD
UKG 199-247/2007	Sheep	08.08.07	NT	Negative	NVD
UKG 248/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 249-251/2007	Pig	08-09.08.07	NT	NT	NT
UKG 252/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 253-258/2007	Pig	08-09.08.07	NT	NT	NT
UKG 259/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 260-270/2007	Pig	08-09.08.07	NT	NT	NT
UKG 271/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 272-275/2007	Pig	08-09.08.07	NT	NT	NT
UKG 276/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 277-303/2007	Pig	08-09.08.07	NT	NT	NT
UKG 304/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 305-320/2007	Pig	08-09.08.07	NT	NT	NT

UKG 321/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 322/2007	Pig	08-09.08.07	NT	NT	NT
UKG 323-326/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 327/2007	Pig	08-09.08.07	NT	NT	NT
UKG 328/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 329-346/2007	Pig	08-09.08.07	NT	NT	NT
UKG 347-362/2007	Cattle	08-09.08.07	NVD	Negative	NVD
UKG 363-364/2007	Pig	08-09.08.07	NT	NT	NT
UKG 365/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 366-376/2007	Pig	08-09.08.07	NT	NT	NT
UKG 377-378/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 379-384/2007	Pig	08-09.08.07	NT	NT	NT
UKG 385/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 386-387/2007	Pig	08-09.08.07	NT	NT	NT
UKG 388/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 389-397/2007	Pig	08-09.08.07	NT	NT	NT
UKG 398-401/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 402-410/2007	Pig	08-09.08.07	NT	NT	NT
UKG 411/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 412-432/2007	Pig	08-09.08.07	NT	NT	NT
UKG 433-441/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 442-448/2007	Pig	08-09.08.07	NT	NT	NT
UKG 449/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 450-452/2007	Pig	08-09.08.07	NT	NT	NT
UKG 453/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 454-463/2007	Pig	08-09.08.07	NT	NT	NT
UKG 464/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 465-468/2007	Pig	08-09.08.07	NT	NT	NT
UKG 469/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 470-471/2007	Pig	08-09.08.07	NT	NT	NT
UKG 472/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 473/2007	Pig	08-09.08.07	NT	NT	NT
UKG 474/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 475/2007	Pig	08-09.08.07	NT	NT	NT
UKG 476/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 477-478/2007	Pig	08-09.08.07	NT	NT	NT
UKG 479/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 480-481/2007	Pig	08-09.08.07	NT	NT	NT
UKG 482/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 483-517/2007	Pig	08-09.08.07	NT	NT	NT
UKG 518-519/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 520-524/2007	Pig	08-09.08.07	NT	NT	NT
UKG 525-526/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 527-533/2007	Pig	08-09.08.07	NT	NT	NT
UKG 534/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 535-542/2007	Pig	08-09.08.07	NT	NT	NT
UKG 543/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 544-547/2007	Pig	08-09.08.07	NT	NT	NT
UKG 548/2007	Pig	08-09.08.07	NT	Negative	NVD
UKG 549-554/2007	Pig	08-09.08.07	NT	NT	NT
UKG 555-558/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 559-564/2007	Pig	08-09.08.07	NT	NT	NT
UKG 565-568/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 569-571/2007	Pig	08-09.08.07	NT	NT	NT
UKG 572/2007	Pig	08-09.08.07	NVD	Negative	NVD

UKG 573/2007	Pig	08-09.08.07	NT	NT	NT
UKG 574/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 575/2007	Pig	08-09.08.07	NT	NT	NT
UKG 576/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 577/2007	Pig	08-09.08.07	NT	NT	NT
UKG 578/2007	Pig	08-09.08.07	NVD	Negative	NVD
UKG 579-589/2007	Pig	08-09.08.07	NT	NT	NT
UKG 590-592/2007	Sheep	08-09.08.07	NVD	Negative	NVD
UKG 593-594/2007	Goat	08-09.08.07	NVD	Negative	NVD
UKG 595-597/2007	Pig	08-09.08.07	NT	Negative	NVD
UKG 598/2007	Cattle	09.08.07	NVD	Negative	NVD
UKG 599-601/2007	Cattle	09.08.07	NVD	Negative	NVD
UKG 602-611/2007	Cattle	09.08.07	NT	Negative	NVD
UKG 612/2007	Sheep	10.08.07	NVD	Negative	NVD
UKG 613-622/2007	Sheep	10.08.07	NT	Negative	NVD
UKG 623/2007	Goat	10.08.07	NT	Negative	NVD
UKG 624-635/2007	Cattle	14.08.07	NVD	Negative	NVD
UKG 636-639/2007	Sheep	14.08.07	NVD	Negative	NVD
UKG 640/2007	Sheep	14.08.07	NVD	Negative	NVD
UKG 641/2007	Sheep	14.08.07	NVD	Negative	NVD
UKG 642-650/2007	Cattle	12.09.07	O	Positive	O
UKG 651-657/2007	Pig	12.09.07	NVD	Negative	NVD
UKG 658-776/2007	Cattle	12.09.07	NT	NT	NT
UKG 777-778/2007	Cattle ?	12.09.07	NVD	Negative	NVD
UKG 779-791/2007	Cattle	12.09.07	NT	Negative	NVD
UKG 792-799/2007	Pig	12.09.07	NT	Negative	NVD
UKG 800/2007	Cattle	13.09.07	O	Positive	O
UKG 801-804/2007	Cattle	13.09.07	NT	NT	NT
UKG 805/2007	Cattle	13.09.07	O	Positive	O
UKG 806-850/2007	Cattle	13.09.07	NVD	Negative	NVD
UKG 851/2007	Cattle	13.09.07	NT	Positive	FMDV GD
UKG 852-855/2007	Cattle	13.09.07	NT	Negative	NVD
UKG 856/2007	Cattle	13.09.07	NT	Positive	FMDV GD
UKG 857-859/2007	Cattle	13.09.07	NT	Negative	NVD
UKG 860-866/2007	Pig	13.09.07	NVD	Negative	NVD
UKG 867-870/2007	Goat	13.09.07	NT	Negative	NVD
UKG 871-960/2007	Pig	13.09.07	NT	Negative	NVD
UKG 961-1029/2007	Cattle	13.09.07	NT	Negative	NVD
UKG 1030/2007	Cattle	14.09.07	NVD	Negative	NVD
UKG 1031-1089/2007	Cattle	14.09.07	NT	Negative	NVD
UKG 1090-1091/2007	Cattle	14.09.07	NVD	Negative	NVD
UKG 1092-1151/2007	Cattle	14.09.07	NT	Negative	NVD
UKG 1152-1154/2007	Cattle	14.09.07	O	Positive	O
UKG 1155/2007	Cattle	14.09.07	O	Positive	O
UKG 1156/2007	Cattle	14.09.07	O	Negative	O
UKG 1157/2007	Cattle	14.09.07	NVD	Negative	NVD
UKG 1158/2007	Cattle	14.09.07	O	Negative	O
UKG 1159-1164/2007	Cattle	14.09.07	NVD	Negative	NVD
UKG 1165/2007	Cattle	14.09.07	O	Negative	O
UKG 1166-1169/2007	Cattle	14.09.07	NVD	Negative	NVD

UKG 1170/2007	Cattle	14.09.07	O	Positive	O
UKG 1171-1181/2007	Cattle	14.09.07	NVD	Negative	NVD
UKG 1182-1225/2007	Cattle	14.09.07	NT	Negative	NVD
UKG 1226-1247/2007	Cattle	15.09.07	NT	Negative	NVD
UKG 1248-1252/2007	Cattle	14/15.09.07	NT	Negative	NVD
UKG 1253-1276/2007	Pig	15.09.07	NT	Negative	NVD
UKG 1277-1362/2007	Cattle	15.09.07	NT	NT	NT
UKG 1363-1364/2007	Cattle	15.09.07	NT	NVD	NVD
UKG 1365-1381/2007	Cattle	14.09.07	NVD	NT	NVD
UKG 1382-1389/2007	Cattle	15, 16.09.07	NT	Negative	NVD
UKG 1390-1403/2007	Cattle	16.09.07	NT	Negative	NVD
UKG 1404-1415/2007	Sheep	15.09.07	NVD	NT	NVD
UKG 1416-1417/2007	Sheep	17.09.07	NVD	Negative	NVD
UKG 1418/2007	Sheep	17.09.07	NVD	Positive	FMDV GD
UKG 1419-1421/2007	Sheep	17.09.07	O	Positive	O
UKG 1422/2007	Sheep	17.09.07	NVD	Negative	NVD
UKG 1423/2007	Sheep	17.09.07	O	Positive	O
UKG 1424/2007	Sheep	17.09.07	NVD	Negative	NVD
UKG 1425-1426/2007	Sheep	17.09.07	O	Positive	O
UKG 1427/2007	Sheep	17.09.07	NVD	Negative	NVD
UKG 1428-1429/2007	Sheep	17.09.07	NVD	Positive	FMDV GD
UKG 1430/2007	Sheep	17.09.07	NVD	Negative	NVD
UKG 1431/2007	Sheep	17.09.07	O	Positive	O
UKG 1432-1433/2007	Pig	17.09.07	NT	Negative	NVD
UKG 1434-1449/2007	Sheep	17.09.07	NT	Negative	NVD
UKG 1450-1471/2007	Cattle	17.09.07	NT	Negative	NVD
UKG 1472-1478/2007	Cattle	19.09.07	NVD	Negative	NVD
UKG 1479-1483/2007	Cattle	20.09.07	NVD	Negative	NVD
UKG 1484-1486/2007	Cattle	21.09.07	O	Positive	O
UKG 1487/2007	Cattle	21.09.07	NT	NT	NT
UKG 1488/2007	Cattle	21.09.07	O	Positive	O
UKG 1489/2007	Cattle	21.09.07	NVD	Negative	NVD
UKG 1490-1494/2007	Cattle	21.09.07	NVD	Negative	NVD
UKG 1495/2007	Cattle	21.09.07	O	Positive	O
UKG 1496/2007	Cattle	21.09.07	NVD	Negative	NVD
UKG 1497/2007	Cattle	21.09.07	O	Positive	O
UKG 1498-1506/2007	Cattle	21.09.07	NVD	Negative	NVD

UKG 1507/2007	Cattle	21.09.07	O	Negative	O
UKG 1508-1513/2007	Cattle	21.09.07	NVD	Negative	NVD
UKG 1514/2007	Cattle	21.09.07	O	Positive	O
UKG 1515-1522/2007	Cattle	21.09.07	NVD	Negative	NVD
UKG 1523-1531/2007	Cattle	23.09.07	NVD	Negative	NVD
UKG 1532-1630/2007	Cattle	23.09.07	NT	Negative	NVD
UKG 1656-1675/2007	Cattle	23.09.07	NT	Negative	NVD
UKG 1631-1633/2007	Cattle	23.09.07	NT	Negative	NVD
UKG 1634-1655/2007	Cattle	23.09.07	NT	Negative	NVD
UKG 1676-1678/2007	Cattle	24.09.07	NVD	Negative	NVD
UKG 1679/2007	Cattle	24.09.07	O	Positive	O
UKG 1680-1683/2007	Cattle	24.09.07	NT	NT	NT
UKG 1684/2007	Cattle	24.09.07	O	Positive	O
UKG 1685-1692/2007	Cattle	24.09.07	NT	NT	NT
UKG 1693-1695/2007	Cattle	24.09.07	O	Positive	O
ULG 1696/2007	Cattle	24.09.07	O	Negative	O
UKG 1697-1704/2007	Cattle	24.09.07	O	Positive	O
UKG 1705/2007	Cattle	24.09.07	NVD	Positive	FMDV GD
UKG 1706-1708/2007	Cattle	24.09.07	O	Positive	O
UKG 1709/2007	Cattle	24.09.07	NVD	Positive	FMDV GD
UKG 1710-1716/2007	Cattle	24.09.07	NT	Negative	NVD
UKG 1717-1749/2007	Cattle	24.09.07	NT	Negative	NVD
UKG 1750-1755/2007	Cattle	24.09.07	NT	Negative	NVD
UKG 1756-1771/2007	Cattle	25.09.07	NT	Negative	NVD
UKG 1772-1774/2007	Cattle	25.09.07	NT	Negative	NVD
UKG 1775-1822/2007	Cattle	25.09.07	NT	Negative	NVD
UKG 1823-1842/2007	Sheep	26.09.07	NVD	Negative	NVD
UKG 1843-1857/2007	Cattle	26.09.07	NVD	Negative	NVD
UKG 1858-1890/2007	Cattle	26.09.07	NT	Negative	NVD
UKG 1891-1895/2007	Cattle	26.09.07	NT	Negative	NVD
UKG 1896-1912/2007	Cattle	26.09.07	NT	Negative	NVD
UKG 1913-1919/2007	Cattle	26.09.07	NT	Negative	NVD
UKG 1920-1955/2007	Cattle	26.09.07	NT	Negative	NVD
UKG 1956-2074/2007	Cattle	26.09.07	NT	Negative	NVD

	UKG 2075-2092/2007	Sheep	27.09.07	NVD	Negative	NVD
	UKG 2093-2117/2007	Sheep	27.09.07	NT	Negative	NVD
	UKG 2118/2007	Cattle	27.09.07	NT	Negative	NVD
	UKG 2119-2166/2007	Cattle	27.09.07	NT	Negative	NVD
	UKG 2167-2207/2007	Cattle	26.09.07	NT	Negative	NVD
	UKG 2208-2243/2007	Cattle	28.09.07	NT	Negative	NVD
	UKG 2244-2260/2007	Cattle	28.09.07	NT	Negative	NVD
	UKG 2261-2324/2007	Cattle	28.09.07	NT	Negative	NVD
	UKG 2325-2365/2007	Cattle	29.09.07	NT	Negative	NVD
	UKG 2366/2007	Cattle	29.09.07	O	Positive	O
	UKG 2367/2007	Cattle	29.09.07	O	NT	O
	UKG 2368-2374/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2375/2007	Cattle	29.09.07	O	Positive	O
	UKG 2376-2379/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2380/2007	Cattle	29.09.07	O	Negative	O
	UKG 2381-2384/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2385/2007	Cattle	29.09.07	O	Negative	O
	UKG 2386-2392/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2393/2007	Cattle	29.09.07	O	Negative	O
	UKG 2394-2397/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2398-2400/2007	Cattle	29.09.07	O	Negative	O
	UKG 2401-2402/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2403-2404/2007	Cattle	29.09.07	O	Negative	O
	UKG 2405-2407/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2408-2410/2007	Cattle	29.09.07	O	Negative	NVD
	UKG 2411-2415/2007	Cattle	29.09.07	NVD	Negative	NVD
	UKG 2416-2418/2007	Cattle	29.09.07	O	Negative	O
	UKG 2419-2421/2007	Cattle	29.09.07	NVD	Negative	NVD
YEMEN	YEM 1/2006	Cattle	01.03.06	NVD	Positive	FMDV GD
	YEM 2/2006	Cattle	01.03.06	NVD	Positive	FMDV GD
	YEM 3/2006	Cattle	01.03.06	O	Positive	O
	YEM 4/2006	Cattle	01.03.06	O	Positive	O
	YEM 5/2006	Cattle	01.03.06	NVD	Negative	NVD
	YEM 6/2006	Cattle	01.03.06	NVD	Positive	FMDV GD
	YEM 7/2006	Goat	27.03.06	NVD	Negative	NVD
	YEM 8/2006	Cattle	11.05.06	NVD	Positive	FMDV GD
	YEM 9/2006	Cattle	11.05.06	NVD	Negative	NVD
	YEM 10/2006	Cattle	11.05.06	NVD	Positive	FMDV GD

	YEM 11/2006	Cattle	11.05.06	NVD	Negative	NVD
	YEM 12/2006	Cattle	11.05.06	NVD	Negative	NVD
	YEM 13/2006	Cattle	17.05.06	NVD	Positive	FMDV GD
	YEM 14/2006	Cattle	17.05.06	NVD	Positive	FMDV GD
	YEM 15/2006	Cattle	27.05.06	NVD	Positive	FMDV GD
	YEM 16/2006	Cattle	27.05.06	NVD	Positive	FMDV GD
	YEM 17/2006	Cattle	27.05.06	NVD	Positive	FMDV GD
	YEM 18/2006	Cattle	27.05.06	NVD	Positive	FMDV GD
	YEM 19/2006	Cattle	27.05.06	NVD	Negative	NVD
	YEM 20/2006	Sheep	29.05.06	NVD	Negative	NVD
	YEM 21/2006	Sheep	29.05.06	NVD	Negative	NVD
	YEM 22/2006	Sheep	29.05.06	NVD	Negative	NVD
	YEM 23/2006	Sheep	29.05.06	NVD	Negative	NVD
	YEM 24/2006	Cattle	31.05.06	NVD	Negative	NVD
	YEM 25/2006	Cattle	31.05.06	NVD	Negative	NVD
	YEM 26/2006	Cattle	31.05.06	NVD	Positive	FMDV GD
	YEM 27/2006	Cattle	31.05.06	NVD	Positive	FMDV GD
	YEM 28/2006	Cattle	23.11.06	NVD	Positive	FMDV GD
	YEM 29/2006	Cattle	23.11.06	O	Positive	O
SUDAN	SUD 2/2007	Cattle	05.02.07	NVD	Negative	NVD
	SUD 3/2007	Cattle	05.02.07	NVD	Negative	NVD
	SUD 4/2007	Cattle	12.05.07	NVD	Negative	NVD
	SUD 5/2007	Cattle	12.05.07	NVD	Negative	NVD
	SUD 6/2007	Cattle	20.05.07	NVD	Negative	NVD
	SUD 7/2007	Cattle	20.05.07	NVD	Negative	NVD
	SUD 8/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 9/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 10/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 11/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 12/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 13/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 14/2007	Cattle	15.06.07	NVD	Negative	NVD
	SUD 15/2007	Cattle	28.06.07	NVD	Negative	NVD
	SUD 16/2007	Cattle	28.06.07	NVD	Negative	NVD
	SUD 17/2007	Cattle	28.06.07	NVD	Negative	NVD
	SUD 18/2007	Cattle	04.07.07	NVD	Negative	NVD
	SUD 19/2007	Cattle	04.07.09	NVD	Negative	NVD
	SUD 20/2007	Cattle	04.07.09	NVD	Negative	NVD
	SUD 21/2007	Cattle	04.07.09	NVD	Negative	NVD
	SUD 22/2007	Cattle	04.07.09	NVD	Negative	NVD

TOTAL : 2528

*	Institute for Animal Health, Pirbright Laboratory, Woking, Surrey GU24 0NF
FMD(V)	foot-and-mouth disease (virus)
VI/ELISA	FMDV serotype identified following virus isolation in cell culture and antigen ELISA
RT-PCR	reverse transcription polymerase chain reaction on epithelial suspension for FMD viral genome
NK	not known
NVD	no foot-and-mouth disease, swine vesicular disease or vesicular stomatitis virus detected

TABLE B: Summary of samples collected and received to IAH-Pirbright (July – September 2007)

Country	No. of samples	Virus isolation in cell culture/ELISA FMD virus serotypes								RT-PCR for FMD (or SVD) virus (where appropriate)		
		O	A	C	SAT 1, 2 or 3	Asia 1	SVD virus	NVD	NT	Positive	Negative	NT
NORTH KOREA	1	-	-	-	-	1	-	-	-	1	-	-
SUDAN	21	-	-	-	-	-	-	21	-	-	21	-
TURKEY	30	17	8	-	-	-	-	5	-	29	1	-
UGANDA	31	1	-	-	-	-	-	30	-	5	26	-
UNITED KINGDOM	2415	95	-	-	-	-	-	539	1781	98	1798	519
YEMEN	29	3	-	-	-	-	-	26	-	17	12	-
TOTAL	**2527**	**116**	**8**	**-**	**-**	**1**	**-**	**621**	**1781**	**150**	**1858**	**519**

*	Institute for Animal Health, Pirbright Laboratory, Woking, Surrey GU24 0NF
VI/ELISA	FMD (or SVD) virus serotype identified following virus isolation in cell culture and antigen detection ELISA
FMD	foot-and-mouth disease
SVD	swine vesicular disease
NVD	no FMD, SVD or vesicular stomatitis virus detected
NT	not tested
RT-PCR	reverse transcription polymerase chain reaction for FMD (or SVD) viral genome
**	samples from Portugal submitted for SVDV characterisation

NPF, 6 October 2007

TABLE C: Antigenic characterisation of FMD field isolates by matching with vaccine strains by ELISA and/or VNT - r Value data from 1st July to 30th September 2007

Isolates	r values by 2dmVNT for type O Vaccine strains					
	O Manisa	O Ind R2/75	O BFS	O Campos	O Lausanne	O Kaufbeuren
AFG 29/2007	0.76					
AFG 34/2007	0.46					
AFG 36/2007	0.50					
AFG 37/2007	0.46					
AFG 39/2007	0.36					
AFG 42/2007	0.87					
AFG 43/2007	0.74					
AFG 45/2007	0.85					
PAK 20/2007	0.33	0.46				
PAK 48/2007	0.56					
PAK 50/2007	0.56					
PAK 7/2007	0.72					
TUR 11/2007	0.54					
TUR 13/2007	0.50	0.62				
TUR 29/2007	0.55					
TUR 30/2007	0.44					
UGA 18/2007	0.5					
UKG 11/2007	0.46		>1.0	>1.0	0.58	0.79
UKG 7/2007	0.60		>1.0	>1.0	0.72	0.85
UKG 9/2007	0.52		>1.0	>1.0	>1.0	1.0
Vit 3/2005		0.55				
Vit 11/2005		0.48				
Vit 12/2005		0.51				
Vit 1/2006		0.70				
Eth 2/2006	0.74					
Eth 21/2006	0.42					
Eth 27/2006	0.36					
Eth 43/2006	0.64					

Interpretation of r_1 values

In the case of VNT:

$r_1 = \geq 0.3$. Suggests that there is a close relationship between field isolate and vaccine strain. A potent vaccine containing the vaccine strain is likely to confer protection.
$r_1 = < 0.3$. Suggests that the field isolate is so different from the vaccine strain that the vaccine is unlikely to protect.

r values by 2dm VNT and LPBE for type A vaccine strains							
Isolates	Test	Vaccine strains			Test	Vaccine strains	
		A22	A Ind 17/82	A Eritrea		A Irn 87	A K35/80
AFG 44/2007	VNT	0.26	0.14				
AFG 7/2007	VNT	0.29	0.14				
Vit 8/2005	VNT	0.33	0.15				
Vit 18/2005	VNT	0.32	0.18				
Eth 6/2000	VNT	0.20		0.46	LPBE	<0.05	<0.15
Mai 12/2006	VNT	0.61		0.43	LPBE	<0.02	<0.13
Mai 16/2006	VNT	0.21		0.21	LPBE	0.03	0.16
Sud 1/2006	VNT	0.13		0.53	LPBE	<0.02	<0.13
Sud 3/2006	VNT	0.11		0.34			

Interpretation of r_1 values

In the case of ELISA:

r_1 = 0.4-1.0. Suggests that there is a close relationship between field isolate and vaccine strain. A potent vaccine containing the vaccine strain is likely to confer protection.
r_1 = 0.2-0.39, Suggests that the field isolate is antigenically related to the vaccine strain. The vaccine strain might be suitable for use if no closer match can be found provided that a potent vaccine is used and animals are preferably immunised more than once.
r_1 = <0.2. Suggests that the field isolate is so different from the vaccine strain that the vaccine is unlikely to protect

Annex 2: Phylogenetic analysis of characterised FMDV isolates:

Fig 1 Molecular characterisation (based on VP1 sequence) of serotype O FMDV causing outbreaks in the United Kingdom.

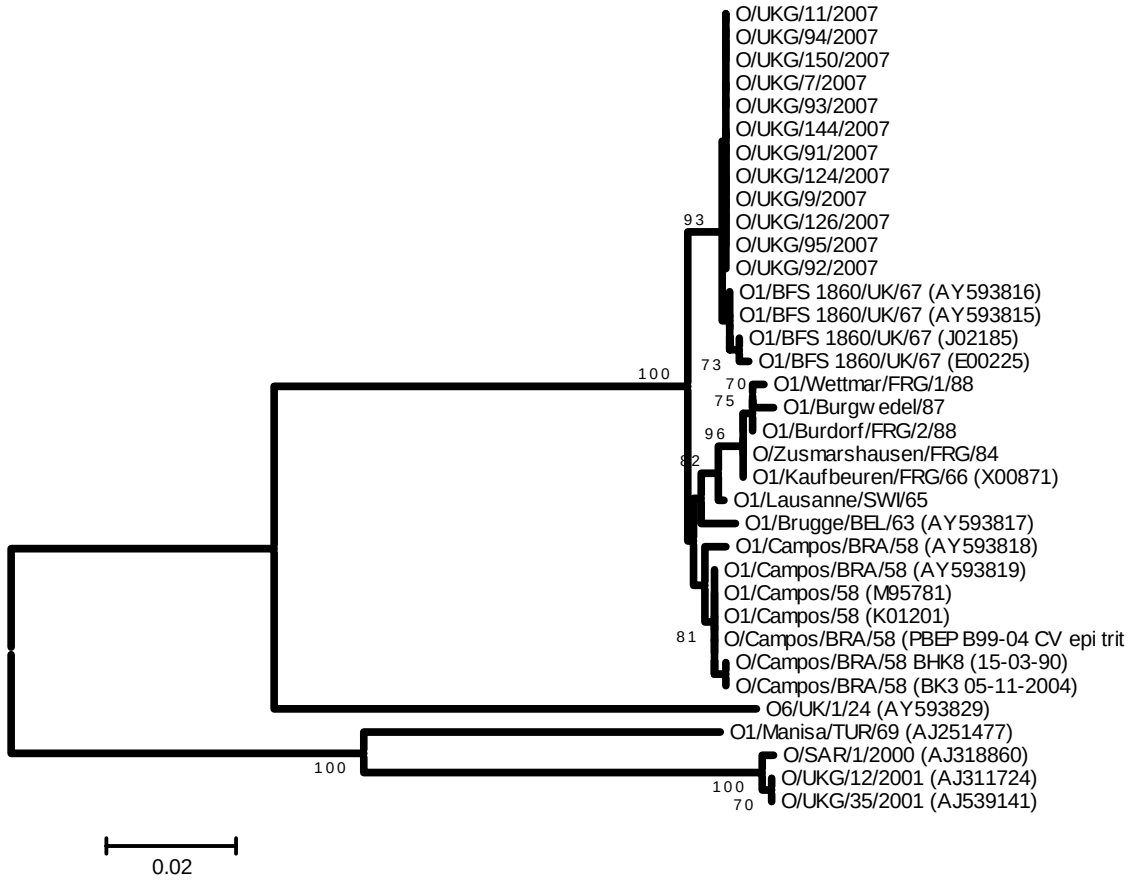

Fig 2 Serotype O from Uganda

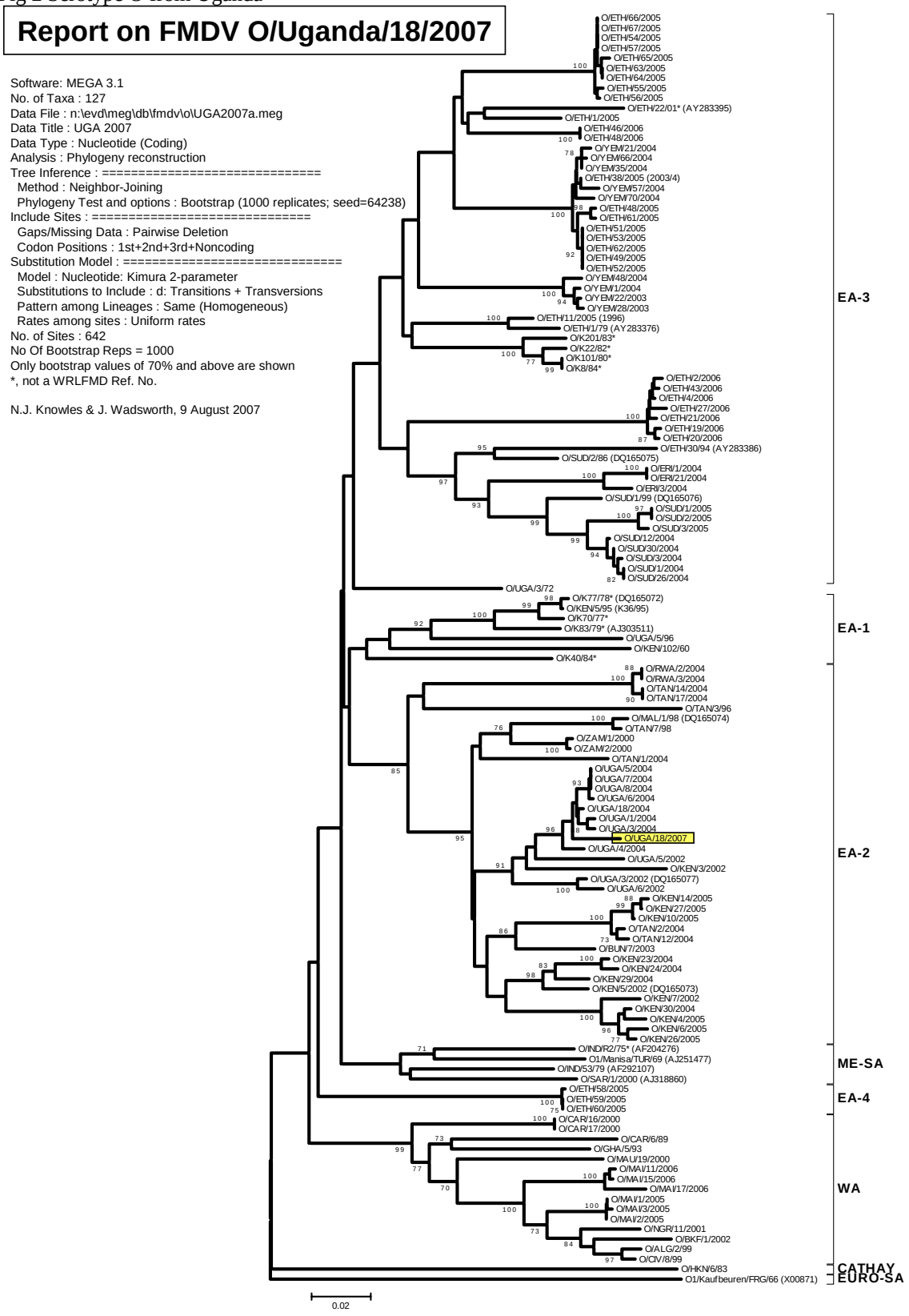

Fig 3 Serotype O from Yemen

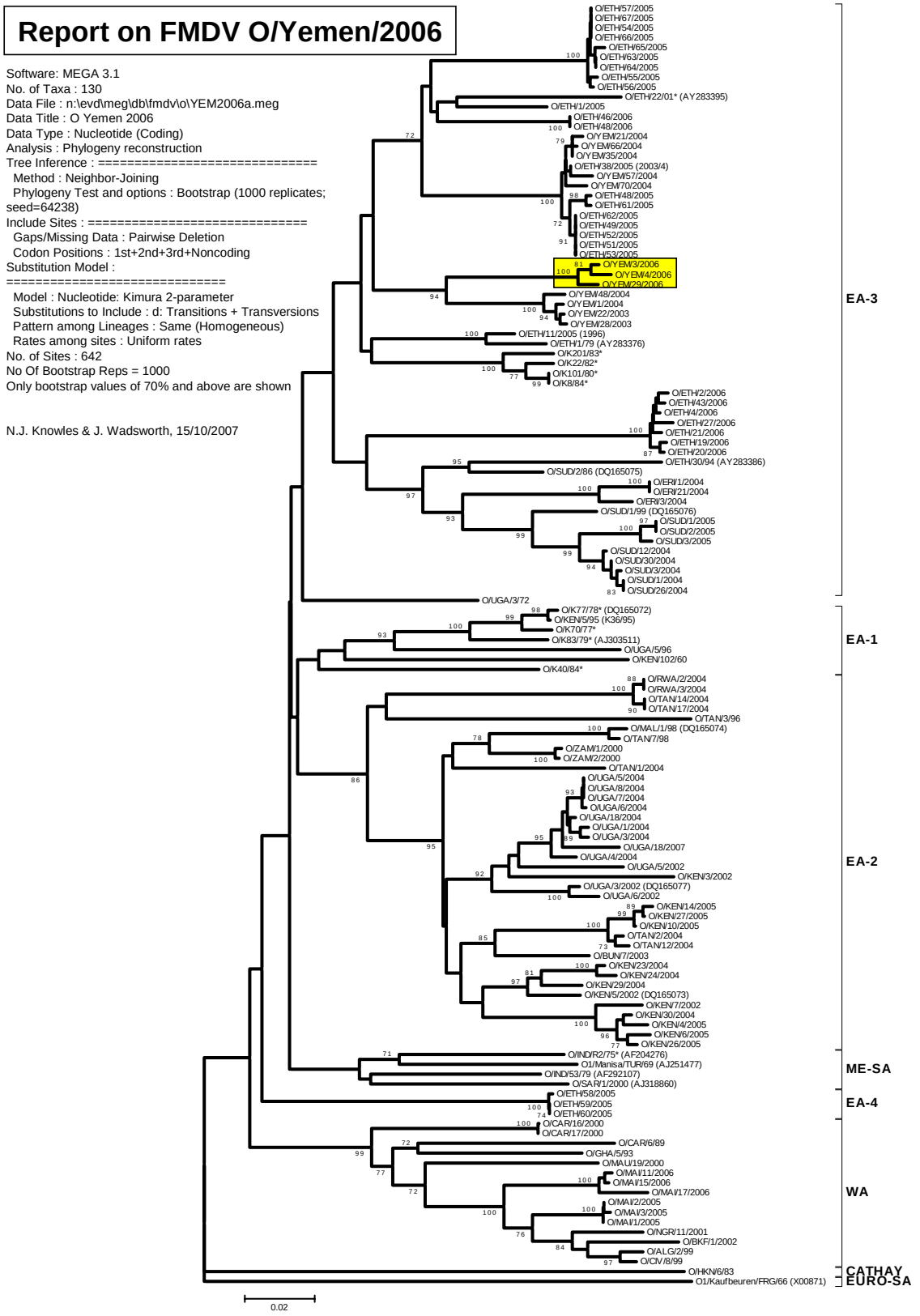

Fig 4 Serotype O from Turkey

Report on 17 FMD type O viruses from Turkey in 2007

Software: MEGA 3.1
No. of Taxa : 197
Data File : n:\evd\meg\db\fmdv\o\TUR2007b.meg
Data Title : O Turkey 2007
Data Type : Nucleotide (Coding)
Analysis : Phylogeny reconstruction
Tree Inference : ==========
  Method : Neighbor-Joining
  Phylogeny Test and options : Bootstrap (1000 replicates; seed=64238)
Include Sites : ==========
  Gaps/Missing Data : Pairwise Deletion
  Codon Positions : 1st+2nd+3rd+Noncoding
Substitution Model : ==========
  Model : Nucleotide: Kimura 2-parameter
  Substitutions to Include : d: Transitions + Transversions
  Pattern among Lineages : Same (Homogeneous)
  Rates among sites : Uniform rates
No. of Sites : 639
No Of Bootstrap Reps = 1000
Only bootstrap values of 70% and above are shown

N.J. Knowles & J. Wadsworth, 12 September 2007

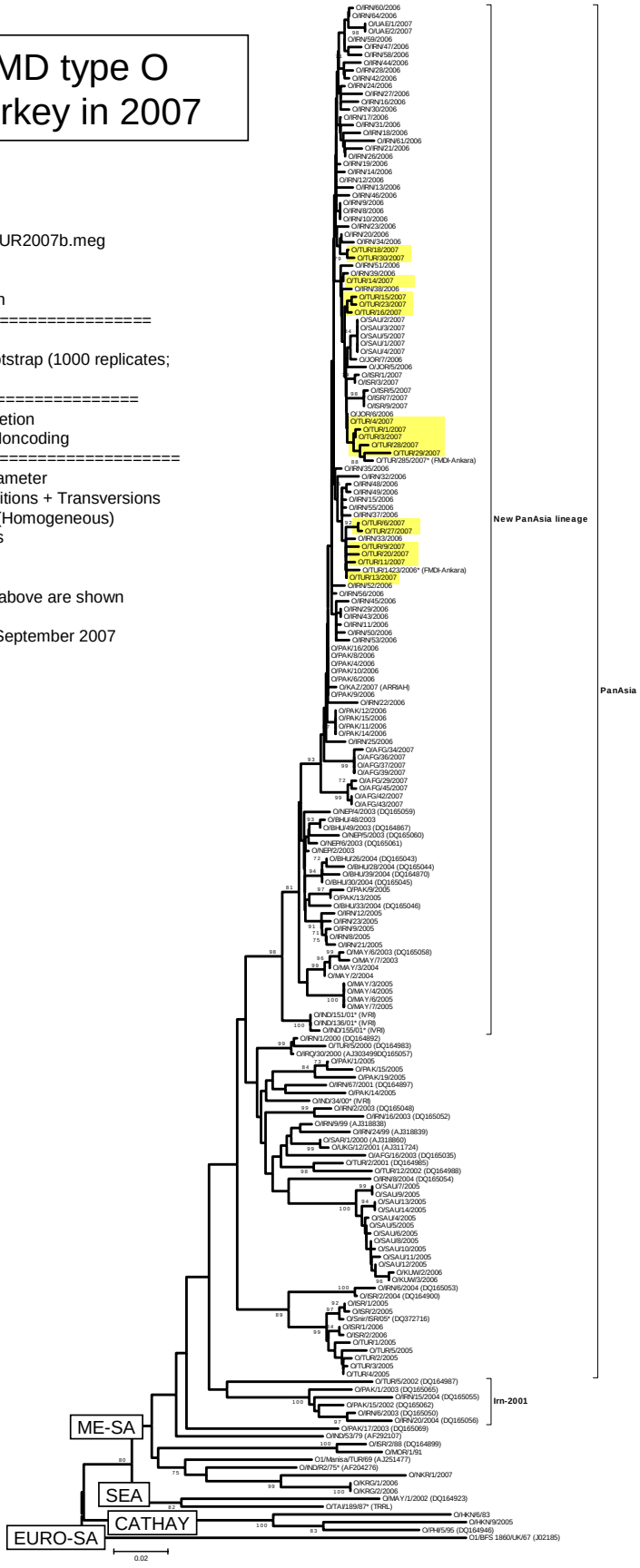

Fig 5 Serotype A from Turkey

Report on 8 FMD type A viruses from Turkey in 2007

Software: MEGA 3.1
No. of Taxa : 133
Data File : n:\evd\meg\db\fmdv\a\TUR2007b.meg
Data Title : A Turkey 2007
Data Type : Nucleotide (Coding)
Analysis : Phylogeny reconstruction
Tree Inference : ==========
  Method : Neighbor-Joining
  Phylogeny Test and options : Bootstrap (1000 replicates; seed=64238)
Include Sites : ==========
  Gaps/Missing Data : Pairwise Deletion
  Codon Positions : 1st+2nd+3rd+Noncoding
Substitution Model : ==========
  Model : Nucleotide: Kimura 2-parameter
  Substitutions to Include : d: Transitions + Transversions
  Pattern among Lineages : Same (Homogeneous)
  Rates among sites : Uniform rates
No. of Sites : 645
No Of Bootstrap Reps = 1000
Only bootstrap values of 70% and above are shown

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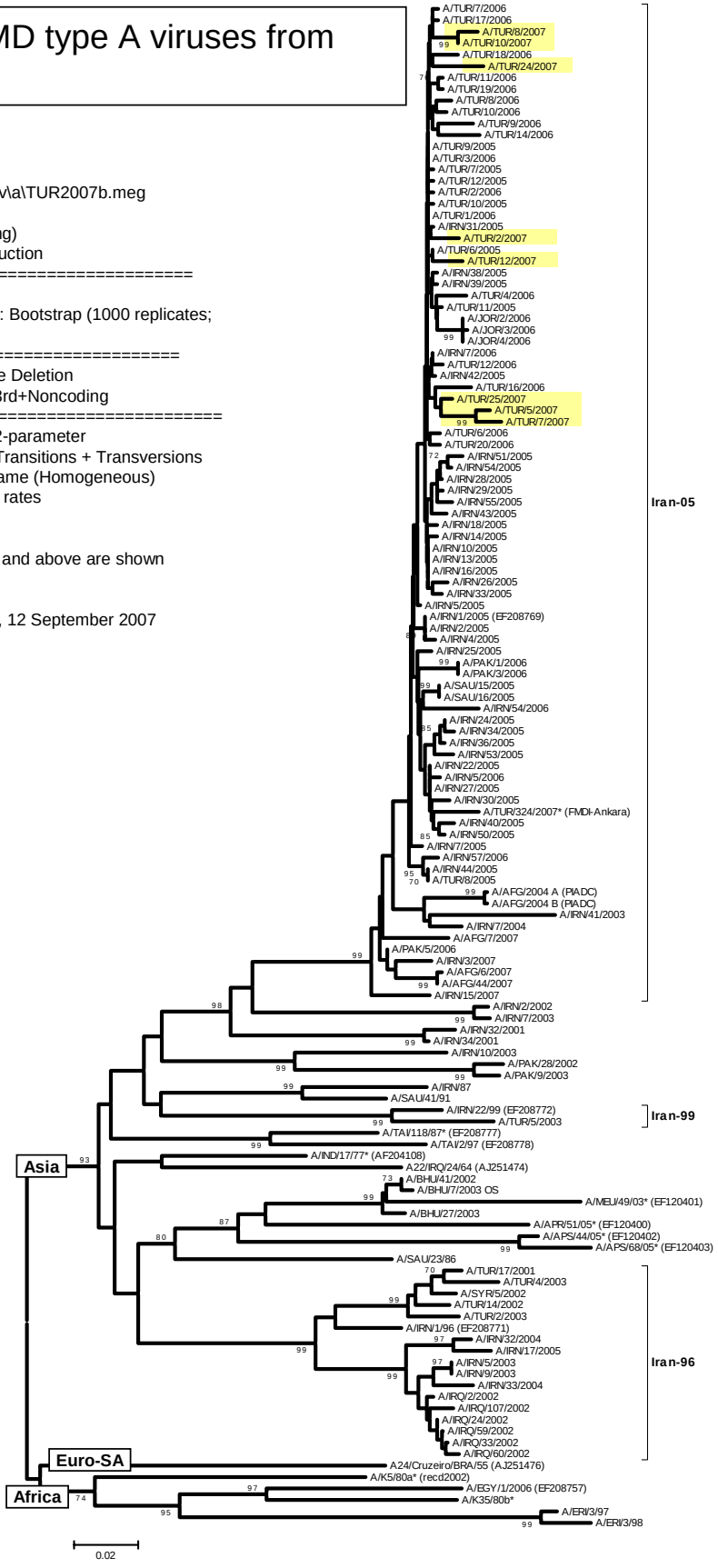

Annex 4. RECOMMENDATIONS FROM THE WRL ON FMD VIRUS STRAINS TO BE INCLUDED IN FMDV ANTIGEN BANKS – June 2007

High Priority

O Manisa (*covers panasian topotype)*
O BFS or Campos
A24 Cruzeiro
Asia 1 Shamir
A Iran ’96
A22 Iraq
SAT 2 Saudi Arabia *(or equivalent)*
(not in order of importance)

Medium Priority

A Eritrea
SAT 2 Zimbabwe
AIran 87 or A Saudi Arabia 23/86 *(or equivalent)*
SAT 1 South Africa
A Malaysia 97 *(or Thai equivalent such as A/NPT/TAI/86)*
A Argentina 2001
O Taiwan 97 *(pig-adapted strain or Philippine equivalent)*
A Iran ’99 (not in order of importance)

Low Priority

A15 Bangkok related strain
A87 Argentina related strain
C Noville
SAT 2 Kenya
SAT 1 Kenya
SAT 3 Zimbabwe
A Kenya (not in order of importance)