

FAO World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD)

Genotyping Report

FMDV serotype: A
Country: Cambodia
Year: 2016
Batch: WRLFMD/2017/00015
No. of sequences: 3
Report date: 21st July 2017
Report generated by: Nick Knowles
Report checked by: Kasia Bankowska



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www: <http://www.wrlfmd.org/>

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Virus sample name:	CAM/2/2016
Sender reference:	CAM10/16R1B2
Location of origin:	Domreyslab, Tree commune, Kandalsteung, Kandal
Country of origin:	Cambodia
Date of collection:	02/12/2016
Host species:	
Serotype:	A
Topotype:	ASIA
Lineage:	Sea-97
Sublineage:	
Sequence length:	630
Ambiguities:	0
Material submitted for sequencing:	BTy1 05/07/2017 & RS1
Harvest date of material:	05/07/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	19/07/2017
Created:	21/07/2017
Last updated:	21/07/2017

VIBASys IDs: sample 34080, genome 34081, sequence viba_34082, sequencing info 34083

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31512	VIT/16/2015	cattle	98.4	0	A	ASIA	Sea-97	
viba_25171	MYA/2/2015	bovine	98.1	0	A	ASIA	Sea-97	
viba_34090	CAM/5/2016		98.1	0	A	ASIA	Sea-97	
viba_25175	MYA/3/2015	bovine	98.1	0	A	ASIA	Sea-97	
viba_25179	MYA/4/2015	bovine	98.1	0	A	ASIA	Sea-97	
viba_21117	Zabaikalsky/RUS/2013	cattle	97.9	0	A	ASIA	Sea-97	
viba_25984	TAI/12/2015	porcine	97.9	0	A	ASIA	Sea-97	
viba_21147	Amur/2/RUS/2013	cattle	97.9	0	A	ASIA	Sea-97	
viba_22520	TAI/17/2014	cattle	97.9	0	A	ASIA	Sea-97	
viba_31524	VIT/16/2016	porcine	97.9	0	A	ASIA	Sea-97	

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_122	TAI/7/2003	bovine	93.3	0	A	ASIA	Sea-97	
viba_625	TAI/2/97		89.7	0	A	ASIA	Sea-97	
viba_630	TAI/118/87		87.1	0	A	ASIA	Thai-87	
viba_594	IRN/1/2011	bovine	82.0	0	A	ASIA	Iran-05	FAR-11
viba_636	IRN/78/2009		81.9	0	A	ASIA	Iran-05	FAR-09
viba_677	IRQ/24/64	bovine	81.9	0	A	ASIA	A22	
viba_589	Bangkok/TAI/60		81.6	0	A	ASIA	A15	
viba_429	TUR/33/2008	cattle	81.5	0	A	ASIA	Iran-05	EZM-07
viba_843	SAU/16/95		81.3	0	A	ASIA	G-VII	
viba_414	AFG/6/2007	bovine	81.3	0	A	ASIA	Iran-05	AFG-07

Virus sample name:	CAM/4/2016
Sender reference:	CAM22/16R1B1
Location of origin:	Domreyslab, Tree commune, Kandalsteung, Kandal
Country of origin:	Cambodia
Date of collection:	02/12/2016
Host species:	
Serotype:	A
Topotype:	ASIA
Lineage:	Sea-97
Sublineage:	
Sequence length:	630
Ambiguities:	0
Material submitted for sequencing:	BTy1 05/07/2017 & RS1
Harvest date of material:	06/07/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	19/07/2017
Created:	21/07/2017
Last updated:	21/07/2017

VIBASys IDs: sample 34084, genome 34085, sequence viba_34086, sequencing info 34087

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_23785	TAI/15/2016	cattle	97.9	0	A	ASIA	Sea-97	
viba_23773	TAI/11/2016	cattle	97.9	0	A	ASIA	Sea-97	
viba_31512	VIT/16/2015	cattle	97.9	0	A	ASIA	Sea-97	
viba_25171	MYA/2/2015	bovine	97.9	0	A	ASIA	Sea-97	
viba_30481	TAI/23/2016	cattle	97.9	0	A	ASIA	Sea-97	
viba_23789	TAI/16/2016	cattle	97.9	0	A	ASIA	Sea-97	
viba_23781	TAI/13/2016	cattle	97.9	0	A	ASIA	Sea-97	
viba_25175	MYA/3/2015	bovine	97.9	0	A	ASIA	Sea-97	
viba_25179	MYA/4/2015	bovine	97.9	0	A	ASIA	Sea-97	
viba_21117	Zabaikalsky/RUS/2013	cattle	97.8	0	A	ASIA	Sea-97	

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_122	TAI/7/2003	bovine	92.7	0	A	ASIA	Sea-97	
viba_625	TAI/2/97		89.4	0	A	ASIA	Sea-97	
viba_630	TAI/118/87		85.7	0	A	ASIA	Thai-87	
viba_677	IRQ/24/64	bovine	81.6	0	A	ASIA	A22	
viba_636	IRN/78/2009		81.3	0	A	ASIA	Iran-05	FAR-09
viba_682	IRN/2/87	bovine	81.1	0	A	ASIA	Iran-87	
viba_594	IRN/1/2011	bovine	81.0	0	A	ASIA	Iran-05	FAR-11
viba_414	AFG/6/2007	bovine	80.9	0	A	ASIA	Iran-05	AFG-07
viba_791	IRN/125/2010	bovine	80.8	0	A	ASIA	Iran-05	SIS-10
viba_331	AFG/10/2010		80.6	0	A	ASIA	Iran-05	HER-10

Virus sample name:	CAM/5/2016
Sender reference:	CAM5/16B3
Location of origin:	Domreyslab, Tree commune, Kandalsteung, Kandal
Country of origin:	Cambodia
Date of collection:	02/12/2016
Host species:	
Serotype:	A
Topotype:	ASIA
Lineage:	Sea-97
Sublineage:	
Sequence length:	630
Ambiguities:	0
Material submitted for sequencing:	BTy1 05/07/2017 & RS1
Harvest date of material:	05/07/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	19/07/2017
Created:	21/07/2017
Last updated:	21/07/2017

VIBASys IDs: sample 34088, genome 34089, sequence viba_34090, sequencing info 34091

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31512	VIT/16/2015	cattle	99.7	0	A	ASIA	Sea-97	
viba_25171	MYA/2/2015	bovine	99.4	0	A	ASIA	Sea-97	
viba_25175	MYA/3/2015	bovine	99.4	0	A	ASIA	Sea-97	
viba_25179	MYA/4/2015	bovine	99.4	0	A	ASIA	Sea-97	
viba_21117	Zabaikalsky/RUS/2013	cattle	99.2	0	A	ASIA	Sea-97	
viba_25984	TAI/12/2015	porcine	99.2	0	A	ASIA	Sea-97	
viba_31504	VIT/12/2015	cattle	99.2	0	A	ASIA	Sea-97	
viba_21147	Amur/2/RUS/2013	cattle	99.2	0	A	ASIA	Sea-97	
viba_22520	TAI/17/2014	cattle	99.2	0	A	ASIA	Sea-97	
viba_31508	VIT/13/2015	cattle	99.2	0	A	ASIA	Sea-97	

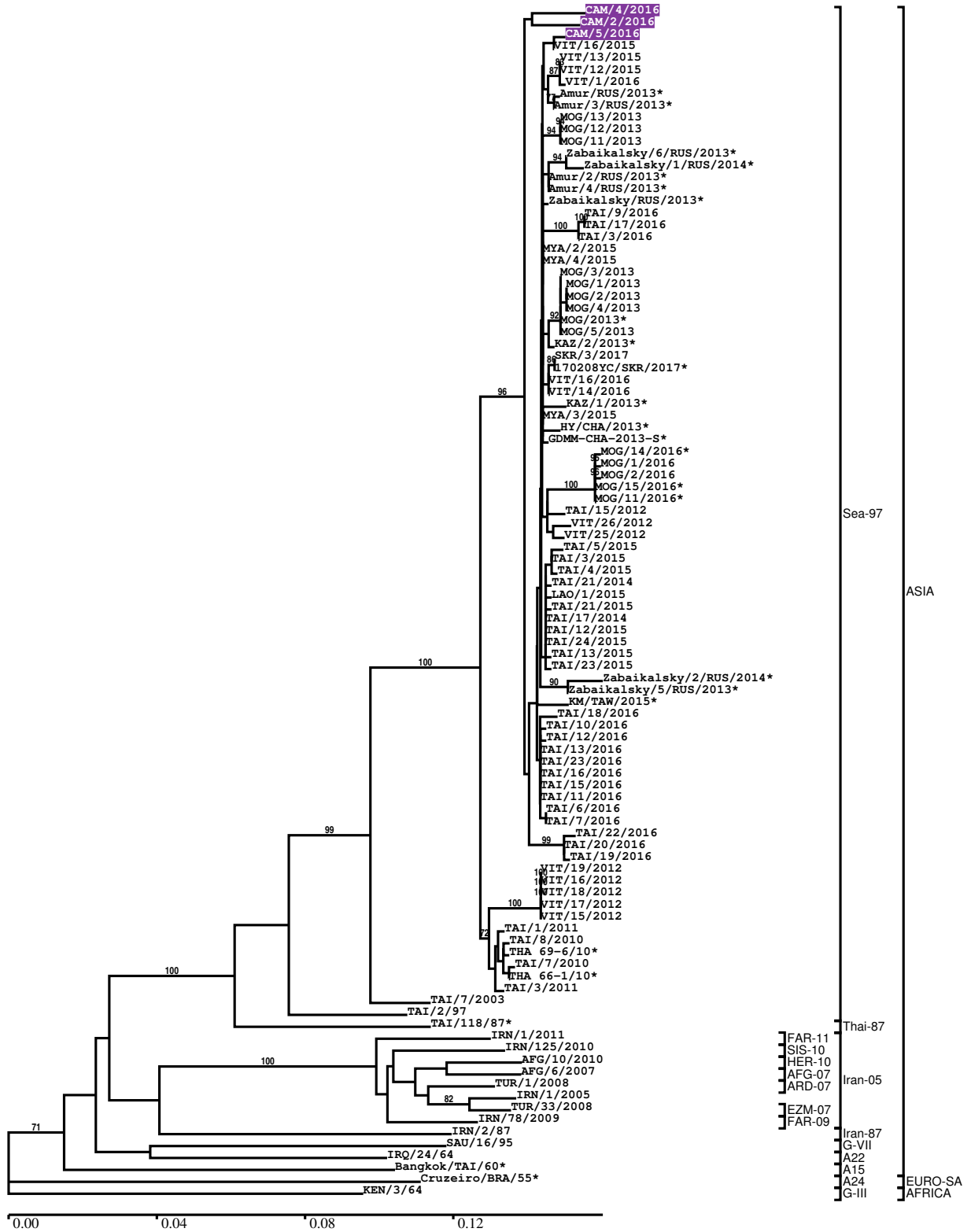
Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_122	TAI/7/2003	bovine	93.3	0	A	ASIA	Sea-97	
viba_625	TAI/2/97		89.7	0	A	ASIA	Sea-97	
viba_630	TAI/118/87		87.3	0	A	ASIA	Thai-87	
viba_677	IRQ/24/64	bovine	81.9	0	A	ASIA	A22	
viba_682	IRN/2/87	bovine	81.3	0	A	ASIA	Iran-87	
viba_636	IRN/78/2009		81.0	0	A	ASIA	Iran-05	FAR-09
viba_594	IRN/1/2011	bovine	80.9	0	A	ASIA	Iran-05	FAR-11
viba_133	IRN/1/2005	cattle	80.8	0	A	ASIA	Iran-05	
viba_429	TUR/33/2008	cattle	80.8	0	A	ASIA	Iran-05	EZM-07
viba_403	TUR/1/2008	cattle	80.6	0	A	ASIA	Iran-05	ARD-07

Report on FMDV A in Cambodia in 2016

Batch: WRLFMD/2017/00015



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_A
Query sequence set:	WRLFMD/2017/00015-Cambodia-A (3 sequences)
Sequence database set:	allseqs_A (1671 sequences)
Prototype sequence set:	!prototypes_A (34 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	633
Phylogeny reconstruction method:	fdnadist, fneighbor
Number of bootstrap samples:	1000
Random seed for bootstrapping:	1
Displaying bootstrap values above:	70.0%
Number of sequences in tree capped at:	100
Number of prototype sequences in tree:	15
VIBASys version:	master-1.1.0-17-gf69a4d1

Sequences in the Phylogenetic Tree

All sequences in the tree are in taxonomic group FMDV/A

label	accession	host(s)	lab	country	taxonomic information
CAM/4/2016	n/a	n/a	WRLFMD	Cambodia	ASIA/Sea-97
CAM/2/2016	n/a	n/a	WRLFMD	Cambodia	ASIA/Sea-97
CAM/5/2016	n/a	n/a	WRLFMD	Cambodia	ASIA/Sea-97
VIT/16/2015	n/a	cattle	WRLFMD	Vietnam	ASIA/Sea-97
VIT/13/2015	n/a	cattle	WRLFMD	Vietnam	ASIA/Sea-97
VIT/12/2015	n/a	cattle	WRLFMD	Vietnam	ASIA/Sea-97
VIT/1/2016	n/a	water buffalo	WRLFMD	Vietnam	ASIA/Sea-97
Amur/RUS/2013*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
Amur/3/RUS/2013*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
MOG/13/2013	n/a	cattle	WRLFMD	Mongolia	ASIA/Sea-97
MOG/12/2013	n/a	cattle	WRLFMD	Mongolia	ASIA/Sea-97
MOG/11/2013	n/a	cattle	WRLFMD	Mongolia	ASIA/Sea-97
Zabaikalsky/6/RUS/2013*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
Zabaikalsky/1/RUS/2014*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
Amur/2/RUS/2013*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
Amur/4/RUS/2013*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
Zabaikalsky/RUS/2013*	n/a	cattle	n/a	Russia	ASIA/Sea-97
TAI/9/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/17/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/3/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
MYA/2/2015	n/a	bovine	WRLFMD	Myanmar	ASIA/Sea-97
MYA/4/2015	n/a	bovine	WRLFMD	Myanmar	ASIA/Sea-97
MOG/3/2013	n/a	yak	WRLFMD	Mongolia	ASIA/Sea-97
MOG/1/2013	n/a	yak	WRLFMD	Mongolia	ASIA/Sea-97
MOG/2/2013	n/a	yak	WRLFMD	Mongolia	ASIA/Sea-97
MOG/4/2013	n/a	yak	WRLFMD	Mongolia	ASIA/Sea-97
MOG/2013*	n/a	cattle	ARRIAH	Mongolia	ASIA/Sea-97
MOG/5/2013	n/a	yak	WRLFMD	Mongolia	ASIA/Sea-97
KAZ/2/2013*	n/a	cattle	ARRIAH	Kazakhstan	ASIA/Sea-97
SKR/3/2017	n/a	cattle	WRLFMD	South Korea,	ASIA/Sea-97
170208YC/SKR/2017*	n/a	cattle	QIA	Republic of South Korea,	ASIA/Sea-97
VIT/16/2016	n/a	porcine	WRLFMD	Vietnam	ASIA/Sea-97
VIT/14/2016	n/a	cattle	WRLFMD	Vietnam	ASIA/Sea-97
KAZ/1/2013*	n/a	cattle	ARRIAH	Kazakhstan	ASIA/Sea-97

continued on next page

label	accession	host(s)	lab	country	taxonomic information
MYA/3/2015	n/a	bovine	WRLFMD	Myanmar	ASIA/Sea-97
HY/CHA/2013*	KT968663	yak	Sichuan Univ	China	ASIA/Sea-97
GDMM-CHA-2013-S*	KF450794	porcine	n/a	China	ASIA/Sea-97
MOG/14/2016*	n/a	cattle	ARRIAH	Mongolia	ASIA/Sea-97
MOG/1/2016	n/a	cattle	WRLFMD	Mongolia	ASIA/Sea-97
MOG/2/2016	n/a	sheep	WRLFMD	Mongolia	ASIA/Sea-97
MOG/15/2016*	n/a	cattle	ARRIAH	Mongolia	ASIA/Sea-97
MOG/11/2016*	n/a	cattle	ARRIAH	Mongolia	ASIA/Sea-97
TAI/15/2012	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
VIT/26/2012	n/a	cattle	WRLFMD	Vietnam	ASIA/Sea-97
VIT/25/2012	n/a	cattle	WRLFMD	Vietnam	ASIA/Sea-97
TAI/5/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/3/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/4/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/21/2014	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
LAO/1/2015	n/a	cattle	WRLFMD	Laos	ASIA/Sea-97
TAI/21/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/17/2014	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/12/2015	n/a	porcine	WRLFMD	Thailand	ASIA/Sea-97
TAI/24/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/13/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/23/2015	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
Zabaikalsky/2/RUS/2014*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
Zabaikalsky/5/RUS/2013*	n/a	cattle	ARRIAH	Russia	ASIA/Sea-97
KM/TAW/2015*	n/a	cattle	NVRI	Taiwan	ASIA/Sea-97
TAI/18/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/10/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/12/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/13/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/23/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/16/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/15/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/11/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/6/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/7/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/22/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/20/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/19/2016	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
VIT/19/2012	n/a	porcine	WRLFMD	Vietnam	ASIA/Sea-97
VIT/16/2012	n/a	porcine	WRLFMD	Vietnam	ASIA/Sea-97
VIT/18/2012	n/a	porcine	WRLFMD	Vietnam	ASIA/Sea-97
VIT/17/2012	n/a	porcine	WRLFMD	Vietnam	ASIA/Sea-97
VIT/15/2012	n/a	porcine	WRLFMD	Vietnam	ASIA/Sea-97
TAI/1/2011	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/8/2010	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
THA 69-6/10*	n/a	cattle	TRRL	Thailand	ASIA/Sea-97
TAI/7/2010	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
THA 66-1/10*	n/a	cattle	TRRL	Thailand	ASIA/Sea-97
TAI/3/2011	n/a	cattle	WRLFMD	Thailand	ASIA/Sea-97
TAI/7/2003	HQ116312	bovine	WRLFMD	Thailand	ASIA/Sea-97
TAI/2/97	EF208778	n/a	WRLFMD	Thailand	ASIA/Sea-97
TAI/118/87*	EF208777	n/a	WRLFMD	Thailand	ASIA/Thai-87
IRN/1/2011	KY091292	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/125/2010	KY091296	bovine	WRLFMD	Iran	ASIA/Iran-05/SIS-10
AFG/10/2010	KY091293	n/a	WRLFMD	Afghanistan	ASIA/Iran-05/HER-10
AFG/6/2007	FJ755007	bovine	WRLFMD	Afghanistan	ASIA/Iran-05/AFG-07
TUR/1/2008	FJ755133	cattle	WRLFMD	Turkey	ASIA/Iran-05/ARD-07
IRN/1/2005	EF208769	cattle	WRLFMD	Iran	ASIA/Iran-05
TUR/33/2008	FJ755155	cattle	WRLFMD	Turkey	ASIA/Iran-05/EZM-07
IRN/78/2009	KY091291	n/a	WRLFMD	Iran	ASIA/Iran-05/FAR-09
IRN/2/87	EF208770	bovine	WRLFMD	Iran	ASIA/Iran-87
SAU/16/95	EU553874	n/a	WRLFMD	Saudi Arabia	ASIA/G-VII
IRQ/24/64	AY593763	bovine	PIADC	Iraq	ASIA/A22
Bangkok/TAI/60*	AY593755	n/a	PIADC	Thailand	ASIA/A15
Cruzeiro/BRA/55*	AY593768	bovine	PIADC	Brazil	EURO-SA/A24
KEN/3/64	AY593761	n/a	PIADC	Kenya	AFRICA/G-III

*, not a WRLFMD Reference Number
n/a, not available