

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

## Genotyping Report

FMDV serotype: A  
Country: Zambia  
Year: 2018  
Batch: WRLFMD/2018/00032  
No. of sequences: 3  
Report date: 17th January 2019  
Report generated by: Nick Knowles  
Report checked by: Jemma Wadsworth



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

email: [reporting@pirbright.ac.uk](mailto:reporting@pirbright.ac.uk)

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Virus sample name:	ZAM/4/2018
Sender reference:	Sample 1 TS 01
Location of origin:	n/a
Country of origin:	Zambia
Date of collection:	24/10/2018
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	09/01/2019
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	16/01/2019
Created:	17/01/2019
Last updated:	17/01/2019
VIBASys IDs: sample 38432, genome 38433, sequence viba_38434, sequencing info 38435	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_38442	ZAM/6/2018	cattle	100.0	0	A	AFRICA	G-I	
viba_38438	ZAM/5/2018	cattle	100.0	0	A	AFRICA	G-I	
viba_10489	KEN/28/2008	cattle	94.6	0	A	AFRICA	G-I	
viba_11314	K73/08	cattle	94.6	0	A	AFRICA	G-I	
viba_12074	TAN/47/2009	cattle	94.3	0	A	AFRICA	G-I	
viba_12066	TAN/42/2009	cattle	94.2	0	A	AFRICA	G-I	
viba_33361	TAN-CVL-2011-0160	bovine	93.8	0	A	AFRICA	G-I	
viba_33373	TAN-CVL-2011-0146	cattle	93.8	0	A	AFRICA	G-I	
viba_17012	COD/10/2011	cattle	93.7	0	A	AFRICA	G-I	
viba_11717	KEN/22/2009	cattle	93.7	0	A	AFRICA	G-I	

### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		84.0	0	A	AFRICA	G-I	
viba_173	UGA/13/66	bovine	83.5	0	A	AFRICA	G-VII	
viba_699	UKG/119/32		82.7	0	A	EURO-SA	A12	
viba_785	KEN/3/64		82.7	0	A	AFRICA	G-III	
viba_535	NGR/2/73	bovine	82.4	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	82.3	0	A	AFRICA	G-II	
viba_178	SUD/3/77		81.7	0	A	AFRICA	G-IV	
viba_609	GHA/16/73	bovine	81.3	0	A	AFRICA	G-VI	
viba_589	Bangkok/TAI/60		80.0	0	A	ASIA	A15	
viba_336	IRN/1/96	bovine	79.9	1	A	ASIA	Iran-96	

Virus sample name:	ZAM/5/2018
Sender reference:	Sample 2 ES 02
Location of origin:	n/a
Country of origin:	Zambia
Date of collection:	24/10/2018
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	09/01/2019
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	16/01/2019
Created:	17/01/2019
Last updated:	17/01/2019

VIBASys IDs: sample 38436, genome 38437, sequence viba\_38438, sequencing info 38439

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_38434	ZAM/4/2018	cattle	100.0	0	A	AFRICA	G-I	
viba_38442	ZAM/6/2018	cattle	100.0	0	A	AFRICA	G-I	
viba_10489	KEN/28/2008	cattle	94.6	0	A	AFRICA	G-I	
viba_11314	K73/08	cattle	94.6	0	A	AFRICA	G-I	
viba_12074	TAN/47/2009	cattle	94.3	0	A	AFRICA	G-I	
viba_12066	TAN/42/2009	cattle	94.2	0	A	AFRICA	G-I	
viba_33361	TAN-CVL-2011-0160	bovine	93.8	0	A	AFRICA	G-I	
viba_33373	TAN-CVL-2011-0146	cattle	93.8	0	A	AFRICA	G-I	
viba_17012	COD/10/2011	cattle	93.7	0	A	AFRICA	G-I	
viba_11717	KEN/22/2009	cattle	93.7	0	A	AFRICA	G-I	

### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		84.0	0	A	AFRICA	G-I	
viba_173	UGA/13/66	bovine	83.5	0	A	AFRICA	G-VII	
viba_699	UKG/119/32		82.7	0	A	EURO-SA	A12	
viba_785	KEN/3/64		82.7	0	A	AFRICA	G-III	
viba_535	NGR/2/73	bovine	82.4	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	82.3	0	A	AFRICA	G-II	
viba_178	SUD/3/77		81.7	0	A	AFRICA	G-IV	
viba_609	GHA/16/73	bovine	81.3	0	A	AFRICA	G-VI	
viba_589	Bangkok/TAI/60		80.0	0	A	ASIA	A15	
viba_336	IRN/1/96	bovine	79.9	1	A	ASIA	Iran-96	

Virus sample name:	ZAM/6/2018
Sender reference:	Sample 3 GS 01
Location of origin:	n/a
Country of origin:	Zambia
Date of collection:	24/10/2018
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
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Received for sequencing:	16/01/2019
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Last updated:	17/01/2019
VIBASys IDs: sample 38440, genome 38441, sequence viba_38442, sequencing info 38443	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_38434	ZAM/4/2018	cattle	100.0	0	A	AFRICA	G-I	
viba_38438	ZAM/5/2018	cattle	100.0	0	A	AFRICA	G-I	
viba_10489	KEN/28/2008	cattle	94.6	0	A	AFRICA	G-I	
viba_11314	K73/08	cattle	94.6	0	A	AFRICA	G-I	
viba_12074	TAN/47/2009	cattle	94.3	0	A	AFRICA	G-I	
viba_12066	TAN/42/2009	cattle	94.2	0	A	AFRICA	G-I	
viba_33361	TAN-CVL-2011-0160	bovine	93.8	0	A	AFRICA	G-I	
viba_33373	TAN-CVL-2011-0146	cattle	93.8	0	A	AFRICA	G-I	
viba_17012	COD/10/2011	cattle	93.7	0	A	AFRICA	G-I	
viba_11717	KEN/22/2009	cattle	93.7	0	A	AFRICA	G-I	

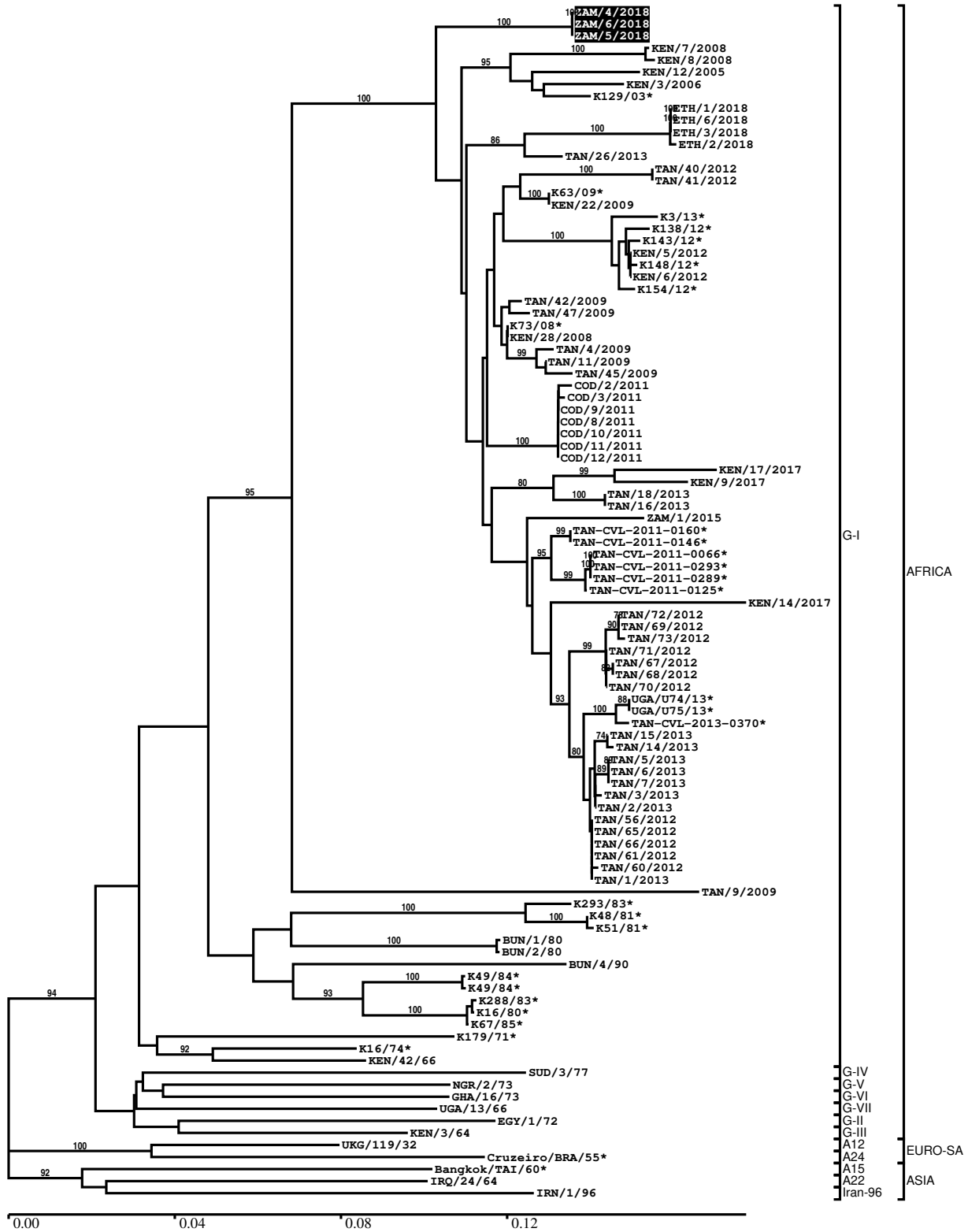
### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		84.0	0	A	AFRICA	G-I	
viba_173	UGA/13/66	bovine	83.5	0	A	AFRICA	G-VII	
viba_699	UKG/119/32		82.7	0	A	EURO-SA	A12	
viba_785	KEN/3/64		82.7	0	A	AFRICA	G-III	
viba_535	NGR/2/73	bovine	82.4	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	82.3	0	A	AFRICA	G-II	
viba_178	SUD/3/77		81.7	0	A	AFRICA	G-IV	
viba_609	GHA/16/73	bovine	81.3	0	A	AFRICA	G-VI	
viba_589	Bangkok/TAI/60		80.0	0	A	ASIA	A15	
viba_336	IRN/1/96	bovine	79.9	1	A	ASIA	Iran-96	

Report on FMDV A in Zambia in 2018

Batch: WRLFMD/2018/00032



\*, not a WRLFMD Reference Number

## Analysis Parameters

VP1 subsequence extractor:	vp1_A
Query sequence set:	WRLFMD/2018/00032-Zambia-A (3 sequences)
Sequence database set:	allseqs_A (1899 sequences)
Prototype sequence set:	!prototypes_A (40 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:	10
VIBASys version:	reflabs-1.1.2

## Sequences in the Phylogenetic Tree

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

label	accession	host(s)	lab	country	taxonomic information
ZAM/4/2018	n/a	cattle	WRLFMD	Zambia	AFRICA/G-I
ZAM/6/2018	n/a	cattle	WRLFMD	Zambia	AFRICA/G-I
ZAM/5/2018	n/a	cattle	WRLFMD	Zambia	AFRICA/G-I
KEN/7/2008	KF561700	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/8/2008	KF561701	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/12/2005	n/a	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/3/2006	n/a	cattle	WRLFMD	Kenya	AFRICA/G-I
K129/03*	KJ440868	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
ETH/1/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
ETH/6/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
ETH/3/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
ETH/2/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
TAN/26/2013	MF592660	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/40/2012	MF592625	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/41/2012	MF592626	cattle	WRLFMD	Tanzania	AFRICA/G-I
K63/09*	KJ440871	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/22/2009	KF561703	cattle	WRLFMD	Kenya	AFRICA/G-I
K3/13*	KJ440876	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K138/12*	KJ440872	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K143/12*	KJ440873	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/5/2012	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
K148/12*	KJ440874	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/6/2012	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
K154/12*	KJ440875	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
TAN/42/2009	KF561695	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/47/2009	KF561697	cattle	WRLFMD	Tanzania	AFRICA/G-I
K73/08*	KJ440870	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/28/2008	KF561702	cattle	WRLFMD	Kenya	AFRICA/G-I
TAN/4/2009	KF561692	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/11/2009	KF561694	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/45/2009	KF561696	cattle	WRLFMD	Tanzania	AFRICA/G-I
COD/2/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/3/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I

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label	accession	host(s)	lab	country	taxonomic information
COD/9/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/8/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/10/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/11/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/12/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
KEN/17/2017	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
KEN/9/2017	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
TAN/18/2013	MF592654	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/16/2013	MF592653	cattle	WRLFMD	Tanzania	AFRICA/G-I
ZAM/1/2015	n/a	bovine	WRLFMD	Zambia	AFRICA/G-I
TAN-CVL-2011-0160*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0146*	n/a	cattle	CVL-Tanzania	Tanzania	AFRICA/G-I
TAN-CVL-2011-0066*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0293*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0289*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0125*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
KEN/14/2017	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
TAN/72/2012	MF592642	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/69/2012	MF592639	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/73/2012	MF592643	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/71/2012	MF592641	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/67/2012	MF592637	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/68/2012	MF592638	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/70/2012	MF592640	cattle	WRLFMD	Tanzania	AFRICA/G-I
UGA/U74/13*	KP089984	bovine	Makerere University	Uganda	AFRICA/G-I
UGA/U75/13*	KP089985	bovine	Makerere University	Uganda	AFRICA/G-I
TAN-CVL-2013-0370*	n/a	cattle	CVL-Tanzania	Tanzania	AFRICA/G-I
TAN/15/2013	MF592652	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/14/2013	MF592651	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/5/2013	MF592648	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/6/2013	n/a	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/7/2013	MF592649	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/3/2013	MF592647	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/2/2013	MF592646	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/56/2012	MF592631	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/65/2012	MF592635	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/66/2012	MF592636	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/61/2012	MF592633	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/60/2012	MF592632	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/1/2013	MF592645	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/9/2009	KF561693	cattle	WRLFMD	Tanzania	AFRICA/G-I
K293/83*	KJ440855	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K48/81*	KJ440852	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K51/81*	KJ440853	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
BUN/1/80	n/a	n/a	WRLFMD	Burundi	AFRICA/G-I
BUN/2/80	n/a	n/a	WRLFMD	Burundi	AFRICA/G-I
BUN/4/90	n/a	n/a	WRLFMD	Burundi	AFRICA/G-I
K49/84*	n/a	cattle	WRLFMD	Kenya	AFRICA/G-I
K49/84*	KJ440857	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K288/83*	KJ440854	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K16/80*	KJ440847	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K67/85*	KJ440858	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K179/71*	KJ440840	n/a	Embakasi/Lindholm	Kenya	AFRICA/G-I
K16/74*	n/a	n/a	WRLFMD	Kenya	AFRICA/G-I
KEN/42/66	KF561699	n/a	WRLFMD	Kenya	AFRICA/G-I

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label	accession	host(s)	lab	country	taxonomic information
SUD/3/77	GU566064	n/a	WRLFMD	Sudan	AFRICA/G-IV
NGR/2/73	KF561704	bovine	WRLFMD	Niger	AFRICA/G-V
GHA/16/73	KF561698	bovine	WRLFMD	Ghana	AFRICA/G-VI
UGA/13/66	KF561705	bovine	WRLFMD	Uganda	AFRICA/G-VII
EGY/1/72	EF208756	bovine	WRLFMD	Egypt	AFRICA/G-II
KEN/3/64	AY593761	n/a	PIADC	Kenya	AFRICA/G-III
UKG/119/32	M10975	n/a	PIADC	United Kingdom	EURO-SA/A12
Cruzeiro/BRA/55*	AY593768	bovine	PIADC	Brazil	EURO-SA/A24
Bangkok/TAI/60*	AY593755	n/a	PIADC	Thailand	ASIA/A15
IRQ/24/64	AY593763	bovine	PIADC	Iraq	ASIA/A22
IRN/1/96	EF208771	bovine	WRLFMD	Iran	ASIA/Iran-96

\*, not a WRLFMD Reference Number

n/a, not available