

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

## Genotyping Report

FMDV serotype: O  
Country: Uganda  
Year: 2020  
Batch: WRLFMD/2021/00014  
No. of sequences: 4  
Report date: 12th November 2021  
Report generated by: Nick Knowles  
Report checked by: Jemma Wadsworth



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

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Virus sample name:	UGA/20/2020
Sender reference:	LR 537
Location of origin:	n/a
Country of origin:	Uganda
Date of collection:	12/09/2020
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	22/10/2021
Primers:	O-1C244F/EUR-2B52R, FMD-3161F/FMD-4303R
Received for sequencing:	08/11/2021
Created:	12/11/2021
Last updated:	12/11/2021
VIBASys IDs: sample 49021, genome 49022, sequence viba_49023, sequencing info 49024	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_48663	COD/6/2021	cattle	99.4	0	O	EA-2		
viba_49031	UGA/24/2020	cattle	99.4	0	O	EA-2		
viba_49027	UGA/22/2020	cattle	99.4	0	O	EA-2		
viba_48667	COD/12/2021	cattle	99.4	0	O	EA-2		
viba_48675	COD/28/2021	cattle	99.4	0	O	EA-2		
viba_49035	UGA/25/2020	cattle	99.4	0	O	EA-2		
viba_48671	COD/19/2021	cattle	99.4	0	O	EA-2		
viba_48695	COD/46/2021	cattle	99.2	0	O	EA-2		
viba_48679	COD/34/2021	cattle	99.2	0	O	EA-2		
viba_48691	COD/43/2021	cattle	99.2	0	O	EA-2		

### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	92.9	0	O	EA-2		
viba_85	UGA/3/2002		88.2	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.2	0	O	EA-2		
viba_221	MAL/1/98		87.2	0	O	EA-2		
viba_523	K83/79		83.3	0	O	EA-1		
viba_116	SUD/2/86	bovine	83.3	0	O	EA-3		
viba_359	Manisa/TUR/69		83.0	0	O	ME-SA		
viba_705	KUW/3/97	bovine	83.0	0	O	ME-SA	Ind-2001	a
viba_62	ETH/2/2006	bovine	82.9	0	O	EA-3		
viba_397	UAE/4/2008	gazelle	82.6	0	O	ME-SA	Ind-2001	c

Virus sample name:	UGA/22/2020
Sender reference:	LR 539
Location of origin:	n/a
Country of origin:	Uganda
Date of collection:	12/09/2020
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	23/10/2021
Primers:	O-1C244F/EUR-2B52R, FMD-3161F/FMD-4303R
Received for sequencing:	08/11/2021
Created:	12/11/2021
Last updated:	12/11/2021

VIBASys IDs: sample 49025, genome 49026, sequence viba\_49027, sequencing info 49028

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_49031	UGA/24/2020	cattle	100.0	0	O	EA-2		
viba_49023	UGA/20/2020	cattle	99.4	0	O	EA-2		
viba_48663	COD/6/2021	cattle	99.4	0	O	EA-2		
viba_48667	COD/12/2021	cattle	99.4	0	O	EA-2		
viba_48675	COD/28/2021	cattle	99.4	0	O	EA-2		
viba_49035	UGA/25/2020	cattle	99.4	0	O	EA-2		
viba_48671	COD/19/2021	cattle	99.4	0	O	EA-2		
viba_48695	COD/46/2021	cattle	99.2	0	O	EA-2		
viba_48679	COD/34/2021	cattle	99.2	0	O	EA-2		
viba_48691	COD/43/2021	cattle	99.2	0	O	EA-2		

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	92.9	0	O	EA-2		
viba_85	UGA/3/2002		88.2	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.2	0	O	EA-2		
viba_221	MAL/1/98		87.2	0	O	EA-2		
viba_523	K83/79		83.3	0	O	EA-1		
viba_359	Manisa/TUR/69		83.0	0	O	ME-SA		
viba_705	KUW/3/97	bovine	83.0	0	O	ME-SA	Ind-2001	a
viba_116	SUD/2/86	bovine	82.9	0	O	EA-3		
viba_62	ETH/2/2006	bovine	82.9	0	O	EA-3		
viba_397	UAE/4/2008	gazelle	82.6	0	O	ME-SA	Ind-2001	c

Virus sample name:	UGA/24/2020
Sender reference:	LR 541
Location of origin:	n/a
Country of origin:	Uganda
Date of collection:	12/09/2020
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	23/10/2021
Primers:	O-1C244F/EUR-2B52R, FMD-3161F/FMD-4303R
Received for sequencing:	08/11/2021
Created:	12/11/2021
Last updated:	12/11/2021
VIBASys IDs: sample 49029, genome 49030, sequence viba_49031, sequencing info 49032	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_49027	UGA/22/2020	cattle	100.0	0	O	EA-2		
viba_49023	UGA/20/2020	cattle	99.4	0	O	EA-2		
viba_48663	COD/6/2021	cattle	99.4	0	O	EA-2		
viba_48667	COD/12/2021	cattle	99.4	0	O	EA-2		
viba_48675	COD/28/2021	cattle	99.4	0	O	EA-2		
viba_49035	UGA/25/2020	cattle	99.4	0	O	EA-2		
viba_48671	COD/19/2021	cattle	99.4	0	O	EA-2		
viba_48695	COD/46/2021	cattle	99.2	0	O	EA-2		
viba_48679	COD/34/2021	cattle	99.2	0	O	EA-2		
viba_48691	COD/43/2021	cattle	99.2	0	O	EA-2		

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	92.9	0	O	EA-2		
viba_85	UGA/3/2002		88.2	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.2	0	O	EA-2		
viba_221	MAL/1/98		87.2	0	O	EA-2		
viba_523	K83/79		83.3	0	O	EA-1		
viba_359	Manisa/TUR/69		83.0	0	O	ME-SA		
viba_705	KUW/3/97	bovine	83.0	0	O	ME-SA	Ind-2001	a
viba_116	SUD/2/86	bovine	82.9	0	O	EA-3		
viba_62	ETH/2/2006	bovine	82.9	0	O	EA-3		
viba_397	UAE/4/2008	gazelle	82.6	0	O	ME-SA	Ind-2001	c

Virus sample name:	UGA/25/2020
Sender reference:	LR 542
Location of origin:	n/a
Country of origin:	Uganda
Date of collection:	12/09/2020
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	23/10/2021
Primers:	O-1C244F/EUR-2B52R, FMD-3161F/FMD-4303R
Received for sequencing:	08/11/2021
Created:	12/11/2021
Last updated:	12/11/2021
VIBASys IDs: sample 49033, genome 49034, sequence viba_49035, sequencing info 49036	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_49023	UGA/20/2020	cattle	99.4	0	O	EA-2		
viba_48663	COD/6/2021	cattle	99.4	0	O	EA-2		
viba_49031	UGA/24/2020	cattle	99.4	0	O	EA-2		
viba_49027	UGA/22/2020	cattle	99.4	0	O	EA-2		
viba_48667	COD/12/2021	cattle	99.4	0	O	EA-2		
viba_48675	COD/28/2021	cattle	99.4	0	O	EA-2		
viba_48671	COD/19/2021	cattle	99.4	0	O	EA-2		
viba_48695	COD/46/2021	cattle	99.2	0	O	EA-2		
viba_48679	COD/34/2021	cattle	99.2	0	O	EA-2		
viba_48691	COD/43/2021	cattle	99.2	0	O	EA-2		

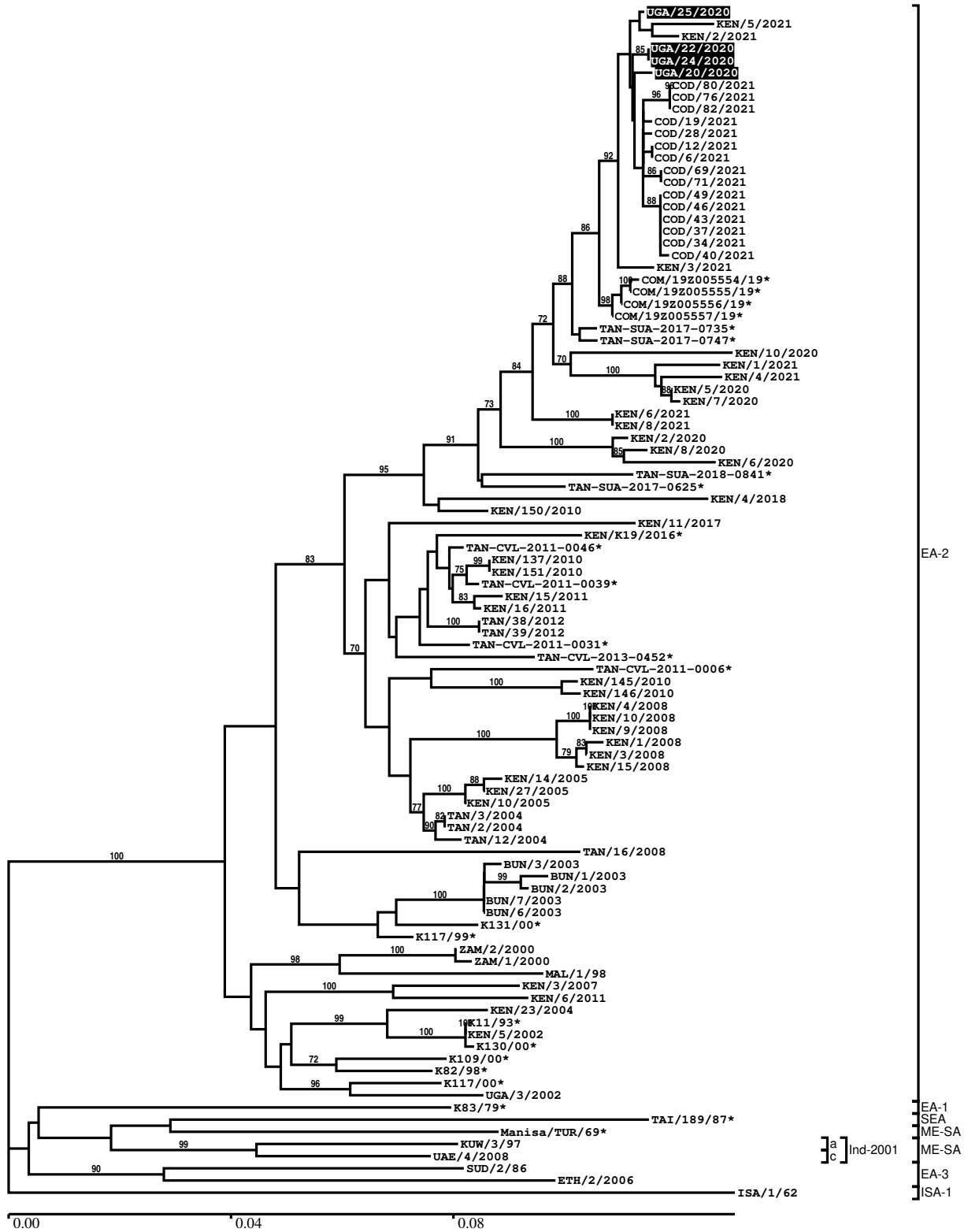
#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	92.9	0	O	EA-2		
viba_85	UGA/3/2002		88.5	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.5	0	O	EA-2		
viba_221	MAL/1/98		87.5	0	O	EA-2		
viba_523	K83/79		83.4	0	O	EA-1		
viba_359	Manisa/TUR/69		83.3	0	O	ME-SA		
viba_116	SUD/2/86	bovine	83.3	0	O	EA-3		
viba_705	KUW/3/97	bovine	83.3	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	82.9	0	O	ME-SA	Ind-2001	c
viba_62	ETH/2/2006	bovine	82.9	0	O	EA-3		

Report on FMDV O in Uganda in 2020

Batch: WRLFMD/2021/00014



\*, not a WRLFMD Reference Number

## Analysis Parameters

VP1 subsequence extractor:	vp1_O
Query sequence set:	WRLFMD/2021/00014-Uganda-O (4 sequences)
Sequence database set:	allseqs_O (5361 sequences)
Prototype sequence set:	!prototypes_O (49 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	636
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/O

label	accession	host(s)	lab	country	taxonomic information
UGA/25/2020	n/a	cattle	WRLFMD	Uganda	EA-2
KEN/5/2021	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/2/2021	n/a	cattle	WRLFMD	Kenya	EA-2
UGA/22/2020	n/a	cattle	WRLFMD	Uganda	EA-2
UGA/24/2020	n/a	cattle	WRLFMD	Uganda	EA-2
UGA/20/2020	n/a	cattle	WRLFMD	Uganda	EA-2
COD/80/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/76/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/82/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/19/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/28/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/12/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/6/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/69/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/71/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/49/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2

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label	accession	host(s)	lab	country	taxonomic information
COD/46/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/43/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/37/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/34/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/40/2021	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
KEN/3/2021	n/a	cattle	WRLFMD	Kenya	EA-2
COM/19Z005554/19*	n/a	cattle	ANSES	Comoros	EA-2
COM/19Z005555/19*	n/a	cattle	ANSES	Comoros	EA-2
COM/19Z005556/19*	n/a	cattle	ANSES	Comoros	EA-2
COM/19Z005557/19*	n/a	cattle	ANSES	Comoros	EA-2
TAN-SUA-2017-0735*	n/a	cattle	SUA	Tanzania	EA-2
TAN-SUA-2017-0747*	n/a	cattle	SUA	Tanzania	EA-2
KEN/10/2020	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/1/2021	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/4/2021	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/5/2020	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/7/2020	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/6/2021	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/8/2021	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/2/2020	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/8/2020	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/6/2020	n/a	cattle	WRLFMD	Kenya	EA-2
TAN-SUA-2018-0841*	n/a	porcine	SUA	Tanzania	EA-2
TAN-SUA-2017-0625*	n/a	cattle	SUA	Tanzania	EA-2
KEN/4/2018	n/a	bovine	WRLFMD	Kenya	EA-2
KEN/15/2010	KF135286	cattle	WRLFMD	Kenya	EA-2
KEN/11/2017	n/a	bovine	WRLFMD	Kenya	EA-2
KEN/K19/2016*	MH882573	cattle	PIADC	Kenya	EA-2
TAN-CVL-2011-0046*	n/a	bovine	CVL	Tanzania	EA-2
KEN/137/2010	KF135282	cattle	WRLFMD	Kenya	EA-2
KEN/151/2010	KF135287	cattle	WRLFMD	Kenya	EA-2
TAN-CVL-2011-0039*	n/a	bovine	CVL	Tanzania	EA-2
KEN/15/2011	KF135292	cattle	WRLFMD	Kenya	EA-2
KEN/16/2011	KF135293	cattle	WRLFMD	Kenya	EA-2
TAN/38/2012	MF592623	cattle	WRLFMD	Tanzania	EA-2
TAN/39/2012	MF592624	cattle	WRLFMD	Tanzania	EA-2
TAN-CVL-2011-0031*	n/a	cattle	CVL, Tanzania	Tanzania	EA-2
TAN-CVL-2013-0452*	n/a	cattle	CVL, Tanzania	Tanzania	EA-2
TAN-CVL-2011-0006*	n/a	bovine	CVL	Tanzania	EA-2
KEN/145/2010	KF135283	cattle	WRLFMD	Kenya	EA-2
KEN/146/2010	KF135284	cattle	WRLFMD	Kenya	EA-2
KEN/4/2008	KF135277	cattle	WRLFMD	Kenya	EA-2
KEN/10/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/9/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/1/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/3/2008	KF135276	cattle	WRLFMD	Kenya	EA-2
KEN/15/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/14/2005	KF135273	cattle	WRLFMD	Kenya	EA-2
KEN/27/2005	KF135274	cattle	WRLFMD	Kenya	EA-2
KEN/10/2005	n/a	cattle	WRLFMD	Kenya	EA-2
TAN/3/2004	KF561680	bovine	WRLFMD	Tanzania	EA-2
TAN/2/2004	KF561679	bovine	WRLFMD	Tanzania	EA-2
TAN/12/2004	KF561681	bovine	WRLFMD	Tanzania	EA-2
TAN/16/2008	KF561684	cattle	WRLFMD	Tanzania	EA-2
BUN/3/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/1/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/2/2003	n/a	n/a	WRLFMD	Burundi	EA-2

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label	accession	host(s)	lab	country	taxonomic information
BUN/7/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/6/2003	n/a	n/a	WRLFMD	Burundi	EA-2
K131/00*	HM756609	bovine	Makerere University	Kenya	EA-2
K117/99*	HM625676 HM756603	bovine	Makerere University	Kenya	EA-2
ZAM/2/2000	n/a	bovine	WRLFMD	Zambia	EA-2
ZAM/1/2000	n/a	bovine	WRLFMD	Zambia	EA-2
MAL/1/98	DQ165074	n/a	WRLFMD	Malawi	EA-2
KEN/3/2007	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/6/2011	KF135291	cattle	WRLFMD	Kenya	EA-2
KEN/23/2004	n/a	cattle	WRLFMD	Kenya	EA-2
K11/93*	HM756598	bovine	Makerere University	Kenya	EA-2
KEN/5/2002	DQ165073	bovine	WRLFMD	Kenya	EA-2
K130/00*	HM756608	bovine	Makerere University	Kenya	EA-2
K109/00*	HM756606 HM625675	bovine	Makerere University	Kenya	EA-2
K82/98*	HM756602	bovine	Makerere University	Kenya	EA-2
K117/00*	HM756607	bovine	Makerere University	Kenya	EA-2
UGA/3/2002	DQ165077	n/a	WRLFMD	Uganda	EA-2
K83/79*	AJ303511	n/a	WRLFMD	Kenya	EA-1
TAI/189/87*	KY091288	bovine	TRRL	Thailand	SEA
Manisa/TUR/69*	AY593823	n/a	PIADC	Turkey	ME-SA
KUW/3/97	DQ164904	bovine	WRLFMD	Kuwait	ME-SA/Ind-2001/a
UAE/4/2008	KM921876	gazelle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/c
SUD/2/86	DQ165075	bovine	WRLFMD	Sudan	EA-3
ETH/2/2006	FJ798127	bovine	WRLFMD	Ethiopia	EA-3
ISA/1/62	AJ303500	n/a	WRLFMD	Indonesia	ISA-1

\*, not a WRLFMD Reference Number

n/a, not available