



**Laboratory Capacity Building with multiple focus:
lessons from the twinning projects (OIE funded)
between the National Animal Disease Diagnostics
and Epidemiology Centre (Uganda) and the
Institute for Animal Health (UK)**

Dr. Ayebazibwe Chrisostom, PhD
Senior Veterinary Officer (Diagnostics
and Epidemiology)

9th October, 2012



Introduction

Map of Africa showing the location of Uganda

Uganda lies central in East Africa and borders South Sudan, Kenya, Tanzania, DRC and Rwanda. This position renders it vulnerable to TAD's since borders are open



Demographics

Uganda's livestock population

Species	Number (millions)
Cattle	11.4
Goats	12.4
Sheep	3.4
Pigs	3.2
Chickens	37.4
Ducks	1.5
Turkeys	0.3



Beautiful Long horned Ankole Cattle

Human population is about 34 million people

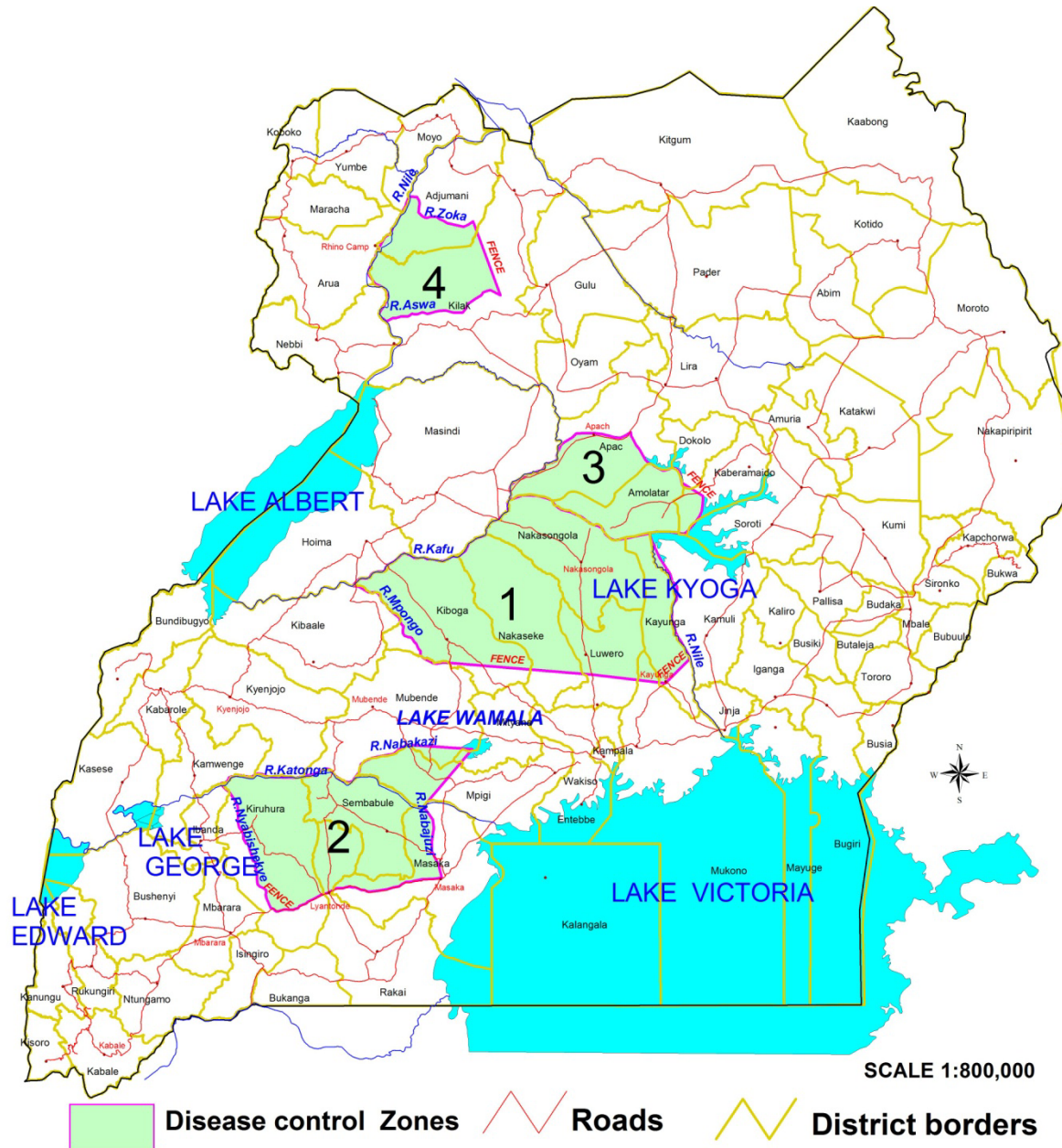
Livestock diseases in Uganda

- Uganda experiences a number of livestock diseases including; FMD, PPR, CBPP, LSD, ASF, CCPP, BT, NCD, rabies, brucellosis, anthrax, trypanosomiasis, tuberculosis, TBD's etc.
- Such diseases make it difficult for affected countries to access lucrative export markets
- In Africa, for example, only 3 countries can export meat from disease free zones (Swaziland, Botswana & S.Africa)

Justification for Twinning

- By partnering the parent and candidate laboratories, twinning projects facilitate rapid technology transfer for early and efficient detection of livestock and wildlife diseases
- Respective countries gain capacity to **plan big (long term strategic framework)** i.e. setting up Disease Controlled Zones (DCZs)
- Multiple disease interventions become inevitable

Map of Uganda Showing the proposed diseased control zones



OIE Supported Twinning Projects

Title	Start Date	Completion Date	Key Objectives	Partners
OIE laboratory twinning project	1/08/2010	31/07/2013	Capacity building and test standardization (serology & PCR) for the diagnosis of PPR, Goat/sheep pox, Blue Tongue, LSD, ASF in line with international trade requirements	
Supplementary Twinning Project	29/9/2011	30-9-2013	<ul style="list-style-type: none"> •Capacity building for improved disease investigations, field sampling, laboratory studies and disease control operations •Targeted field sample collection and establishment of the National Sample Bank •Laboratory capacity improvement and test evaluation • Improvement of laboratory standards, bio-security and test quality 	National Animal Disease Diagnostics and Epidemiology Centre (NADDEC), Ministry of Agriculture Animal Industry and Fisheries & Institute for Animal Health, Pirbright

Target Diseases: PPR, Goat/Sheep pox, Blue Tongue, LSD, ASF and FMD

Project Objectives

- Establish a sample collection including clinical specimens, strains and isolates from Ugandan ruminants, to be used throughout the project in training and validating diagnostic tests.
- Develop, standardise and evaluate RT-PCR tests (conventional gel based, multiplex and real time) for rapid and reliable detection of targeted viruses.
- Transfer of knowledge, reagents and expertise in the applicant lab and establish a programme of the diagnostic capacity upgrading to **OIE ref lab level**, supervised by IAH Pirbright.
- Provide standard operating procedures (SOPs) for diagnostic tests and provide training on quality assurance (QA)
- Molecular and serological analysis of positive specimens, determination of circulating virus serotypes and genotypes and phylogenetics. Risk analysis for the country and region.

Key Achievements

1. Trained 5 Technical Staff at Pirbright: PPR, BTV, Goat Pox and FMD
2. Developed and exchanged panels for PPR, Goat Pox and Blue tongue diagnosis. Blue Tongue antibodies have been detected in goat sera from most districts in Uganda. Goat Pox has been confirmed in Kween district
3. Have had 3 backstopping visits by IAH experts
4. Have participated in 2010, 2011 and planning for 2012 FMD lab proficiency Trials
5. Imported key equipment, reagents and kits for diagnostics of target diseases
6. Have set up Real Time PCR for goat pox, blue tongue, FMD etc.
7. Undertook critical repairs at NADDEC

Equipment and Materials

- Sample Management Computer and Printer
- Air Conditioners
- Ice boxes and ice packs
- GPS
- Gloves
- Kitchen Rolls
- Sample and reagent Fridges/Freezers, sample collection materials
- PCR kits, enzymes, primers
- Modern q-PCR machine – Stratagene
- Power back up systems



Inter-laboratory Comparison Tests

P. DES P. R./RINDERPEST

INSTITUTE FOR ANIMAL HEALTH

Director: Professor John Fazakerley BSc, MBA, PhD, FRCPath

LABORATORY TESTING

PIRBRIGHT LABORATORY

Ash Road, Pirbright, Surrey GU24 0NF

Tel: +44 (0)1483 232441 Fax: +44 (0)1483 232448

Email: iah@iah.ac.uk

Website: www.iah.ac.uk

PPR

Lab Reference: R9/12

Report Date: 31/05/2012

Sender: Dr C Ayebazibwe, Ministry of Agriculture Animal Industry & Fisheries, Diagnostics & Epidemiology Centre, PO Box 24, Entebbe, Uganda.

Results to: SENDER

Sender Reference:

Number Tested: 8

Rebleed: NO

Date Received: 28/05/2012

Country of Origin UGANDA

Species: UNKNOWN

Date Tests Completed: 30/05/2012

Tests Requested: PPR REAL TIME PCR SOPs - NVR-GEN-005

<u>Sample Number</u>	<u>Animal Id</u>	<u>Other Details</u>	<u>PPR PCR</u>	<u>Final Result</u>
R9/12-001	neat	1, UNKNOWN, SAMPLE	POS	POS
R9/12-002	10 -1	2, UNKNOWN, SAMPLE	POS	POS
R9/12-003	10 -2	3, UNKNOWN, SAMPLE	POS	POS
R9/12-004	10 -3	4, UNKNOWN, SAMPLE	POS	POS
R9/12-005	10 -4	5, UNKNOWN, SAMPLE	POS	POS
R9/12-006	10 -5	6, UNKNOWN, SAMPLE	NVD	NEG
R9/12-007	10 -6	7, UNKNOWN, SAMPLE	NVD	NEG
R9/12-008	10 -7	8, UNKNOWN, SAMPLE	NVD	NEG

Pox Virus Results

INSTITUTE FOR ANIMAL HEALTH

Director: Professor John Fazakerley BSc, MBA, PhD, FRCPath

LABORATORY TESTING

PIRBRIGHT LABORATORY

Ash Road, Pirbright, Surrey GU24 0NF

Tel: +44 (0)1483 232441 Fax: +44 (0)1483 232448

Email: iah@iah.ac.uk

Website: www.iah.bbsrc.ac.uk

Lab Reference: P1/12

Report Date: 10/04/2012

Sender: Dr C Ayebazibwe, Diagnostic and Epidemiology Centre,
Ministry of Agriculture, Animal Industry and Fisheries,
P.O. Box 513, Entebbe, Uganda, EMAIL -
dlhe.maaif@imul.com, PHONE - 256 041 320 627

Results to: SENDER

Sender Reference:

Number Tested: 9 **Rebled:** NO

Date Received: 27/01/2012

Country of Origin: UGANDA

Species: BOVINE

Date Tests Completed: 09/02/2012

Tests Requested: CAPRIPOX SNT

<u>Sample Number</u>	<u>Animal Id</u>	<u>Sampling Date</u>	<u>Other Details</u>	<u>SNT</u>	<u>Final Result</u>
P1/12-001	LSD?	11/01/2012	4, BOVINE, SERUM	1/80, POS	POS
P1/12-002	LSD?	11/01/2012	5, BOVINE, SERUM	NEG	NEG
P1/12-003	LSD?	11/01/2012	6, BOVINE, SERUM	NEG	NEG
P1/12-004	LSD?	11/01/2012	7, BOVINE, SERUM	NEG	NEG
P1/12-005	LSD?	11/01/2012	8, BOVINE, SERUM	1/80, POS	POS
P1/12-006	LSD?	11/01/2012	9, BOVINE, SERUM	1/160, POS	POS
P1/12-007	LSD?	11/01/2012	10, BOVINE, SERUM	1/120, POS	POS

BTV Results

ARBOVIROLOGY

INSTITUTE FOR ANIMAL HEALTH

Director: Professor John Fazakerley BSc, MBA, PhD, FRCPath

LABORATORY TESTING

PIRBRIGHT LABORATORY

Ash Road, Pirbright, Surrey GU24 0NF

Tel: +44 (0)1483 232441 Fax: +44 (0)1483 232448

Email: iah@iah.ac.uk

Website: www.iah.bbsrc.ac.uk

Lab Reference: A8/12

Report Date: 10/04/2012

Sender: Dr C Ayebazibwe, Diagnostic and Epidemiology Centre,
Ministry of Agriculture, Animal Industry and Fisheries,
P.O. Box 513, Entebbe, Uganda, EMAIL -
dlhe.maaif@imul.com, PHONE - 256 041 320 627

Results to: SENDER

Sender Reference:

Number Tested: 20 Rebleed: NO

Date Received: 24/01/2012

Country of Origin UGANDA

Species:

Date Tests Completed: 26/01/2012

Tests Requested: BTV REAL TIME RT-PCR SOPs - NVR-GEN-005

<u>Sample Number</u>	<u>Animal Id</u>	<u>Other Details</u>	<u>BTV RT-PCR</u>	<u>Final Result</u>
A8/12-001		1, EDTA BLOOD	NVD	NEG
A8/12-002		2, EDTA BLOOD	POS	POS
A8/12-003		3, EDTA BLOOD	NVD	NEG
A8/12-004		4, EDTA BLOOD	NVD	NEG
A8/12-005		5, EDTA BLOOD	POS	POS
A8/12-006		6, EDTA BLOOD	POS	POS
A8/12-007		7, EDTA BLOOD	POS	POS

Foot-and-mouth disease



Institute for Animal Health

Pirbright Laboratory, Ash Road
Pirbright, Woking, Surrey GU24 0NF
Tel: +44 (0)1483 232441 Fax: +44 (0)1483 232448
E-mail: iah@bbsrc.ac.uk Website: www.iah.bbsrc.ac.uk

Director: Professor John Fazakerley BSc, MBA, PhD, FRCPath

31st August 2012

cayebazibwe@gmail.com

Dear Dr Chrisostom Ayebazibwe,

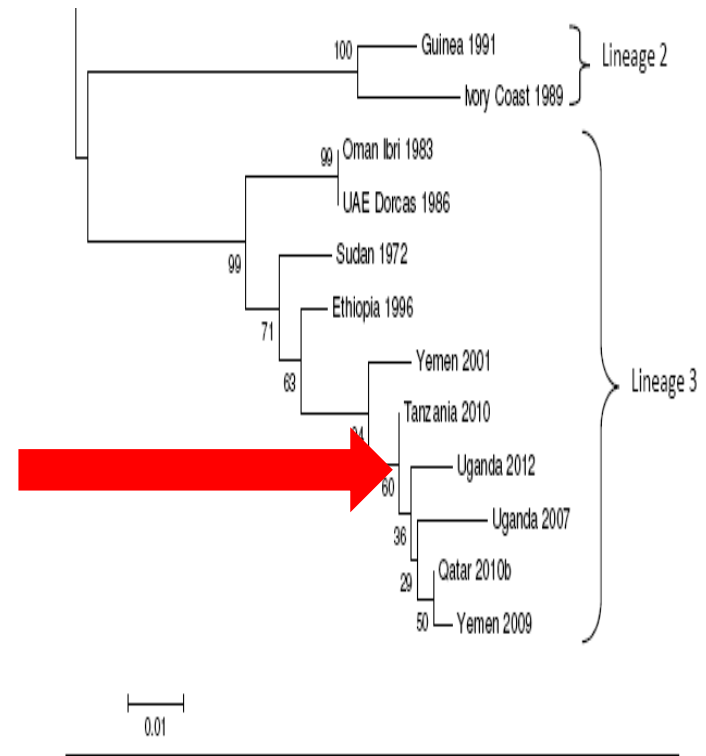
Feedback on Foot-and-Mouth Disease (FMD) and Swine Vesicular Disease (SVD) Combined Proficiency Test Scheme 2011

Panel 2	P2-1	P2-2	P2-3	P2-4	P2-5	P2-6
Tests	FMD O	FMD A	FMD SAT 2	SVD	MEM	MEM
Typing ELISA (Serotype) tested:	✓	x	x	✓	✓	✓
RT-PCR FMD primers:	✓	✓	✓	✓	✓	✓

Improved disease surveillance

PPRV in Uganda 2012

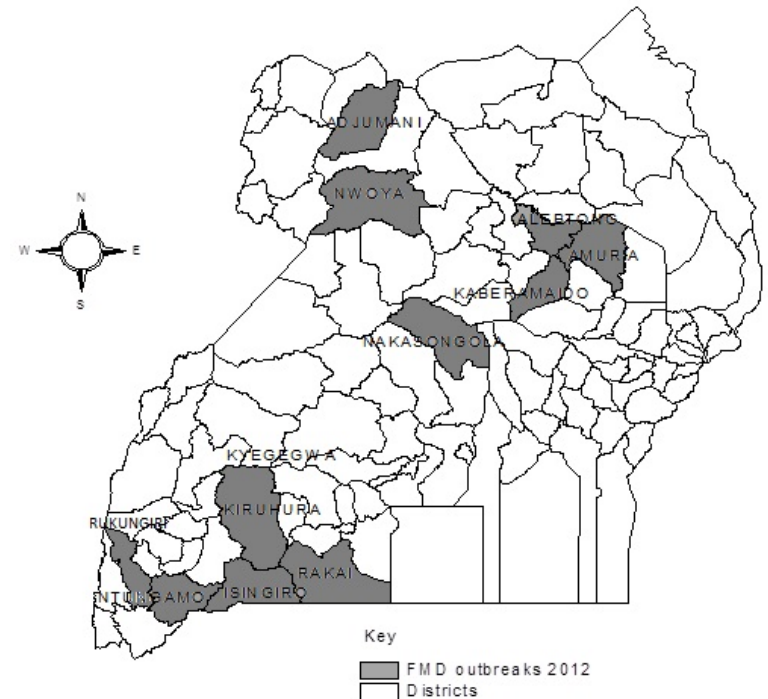
- Recently (May, 2012) a new PPR outbreak has reoccurred in Kotido district in Karamoja
- Molecular epidemiology report indicates that the current PPRV belongs to lineage 3
- More surveillance required to determine the current extent of the disease



Comparison of 322bp of the F gene of Uganda 2012

FMD Diagnostic capacity in Uganda

- Between January and August, 2012, a total of 12 FMD outbreaks (12 districts) have been recorded in Uganda
- Since 2006, only serotype O FMDV outbreaks have been reported in livestock in Uganda. However, SAT 1 and SAT 2 viruses still exist in African buffalos
- Some diagnostic kits and training have been obtained under the Twinning Project to confirm outbreaks



Map of Uganda showing the distribution of FMD outbreaks (January – August, 2012)

Blue Tongue

- Recent survey indicated an overall seroprevalence of 89.7% of antibodies against Blue Tongue virus in goats in 5 districts in Karamoja
- More work to be undertaken to know the national status



Lumpy Skin Disease

- LSD is currently a big problem in Uganda and currently affects more than 80% of the country at varying levels
- Vaccination is on demand driven basis
- There are some complaints that the vaccine is not very effective much as it is very expensive



Improved National Capacity for rapid and accurate disease diagnosis at NADDEC

- The center is now more placed to undertake screening tests, ELISA tests, bacteriology, molecular biology, real time PCR, conventional PCR, LAMP assay, microscopy, IFAT, haematology, pathology and parasitology for many diseases and parasites: FMD, CBPP, ASF, CCPP, PPR, BTV, POX, NCD, LSD, Brucellosis, RVF...
- Well trained staff are available
- The laboratory is generally well equipped
- The laboratory is implementing ISO 17025 and working toward accreditation. Recently participated in PT tests: FMD, PPR, NCD, RVF & AI
- Currently at BSL 2 upgrading to BSL 3 and working towards important aspects of biosecurity and biosafety

Challenges for the twinning projects

- Insufficient budget for laboratory activities
- Understaffing
- Procurement challenges –lab materials take too long to procure

Way Forward

- Need for long term sustained support (projects) for laboratory activities (multiple disease interventions)
- Need to uphold regional and international collaborations/net working for improved diagnostics and disease control

Thank You for Listening !!

