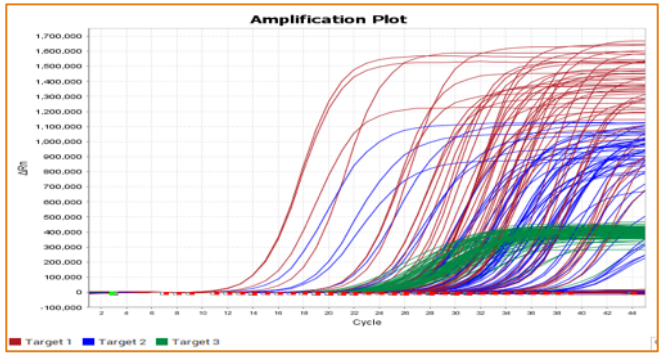

Fig.1. Graphical data outputs of PCR testing for COVID-19

Context

- The COVID-19 pandemic has had a negative impact on human life and the global economy.
- Timely diagnostic tests to identify infected individuals play a major role in controlling spread of the SARS-CoV-2 virus.
- At the onset of increased virus transmission in Kenya, the Kenyan Ministry of Health requested ILRI to support its national COVID-19 diagnostic effort.
- Leveraging our molecular diagnosis and infectious disease research experience and expertise, part of our facilities were repurposed for COVID-19 testing.
- Supported by the Ministry for Economic Cooperation and Federal Development (BMZ) under the ILRI-led **One Health Research, Education and Outreach Centre for Africa (OHRECA)**, and the Government of Kenya, COVID-19 testing was launched on 1st June 2020.

Our innovative approach

1. Sample reception
- Sample quality & safety checks
- Metadata entry

2. Sample Processing
- Sample aliquoting
- RNA extraction
- RT-PCR reaction set-up

3. Real Time PCR
- cDNA generation
- qPCR

4. Results review and Reporting
- Amplification profile
- Baseline setting
- Status determination

5. Sample Archiving
- Aliquoting & storage
- Nasal/Oral sawbs in VTM: Liquid Nitrogen
- RNA extracts: – 80 ^{0}C ultra low freezer

6. Waste management
- Autoclave & Incinerate –solid waste
- Effluent treatment – Liquid waste

ANIMAL & HUMAN HEALTH

Re-purposing ILRI labs to support national COVID-19 testing in Kenya

- ILRI has a rich history of animal health biotech research, including molecular diagnostics
- ILRI has invested in different levels of bio-secure facilities, including a high-containment BSL-3 lab
- The generic nature of ILRI's modern bioscience facilities and expertise allowed us to rapidly re-purpose for COVID-19 testing under safe and secure conditions
- Over 10,000 samples have been tested for presence of SARS-CoV-2 viral RNA so far
- ILRI's investment in COVID-19 testing reflects its full commitment to demonstrating how the One Health approach translates to practice

ILRI-COVID Diagnostic Group
International Livestock Research Institute

Edward Okoth: e.okoth@cigar.org
Samuel Oyola: s.oyola@cgiar.org

Results/Impact

- Several diagnostic kits, sample work-flows and process were optimized and validated prior to starting the service.
- Samples received from Kenyan government institutions & labs are deactivated and processed in a BSL-3 lab prior to PCR testing in a clean BSL-2 room. This ensures high safety and quality standards are maintained.
- Results are returned to Ministry of Health within 24hrs:
  - Data is used at an individual level to identify positive cases and guide control measures, e.g. quarantine.
  - Nationally the data helps estimate the rate of virus spread to set national policies for public health.

Future steps

- Develop in-house reagents to support COVID-19 testing and reduce costs.
- Leverage ILRI's whole genome sequencing and genomic platforms to support COVID-19 research: virus surveillance, evolution, vaccine and drug development
- Extend the diagnostic capacity to investigate pathogens at the wildlife-livestock-human-environment interface to help prevent spill-over events.
- Help develop capacity for diagnostics and rapid response for surveillance.

Partners

We acknowledge with thanks the loan of a PCR machine to this effort by CIFOR-ICRAF (World Agroforestry) and KEMRI-Wellcome Trust labs for sharing information and materials

GLOBAL AGENDA FOR SUSTAINABLE LIVESTOCK