NVI SUPPORTS COVID-19 TESTING IN ETHIOPIA

By: Dr. Esayas Gelaye, Deputy Director General, NVI

With the COVID-19 pandemic crisis occurring worldwide, veterinary laboratories across the globe have been taking part in the diagnosis of the disease, using the technical expertise and diagnostic facilities they have, through one-health coordinated approaches.

The National Veterinary Institute (NVI) of Ethiopia is one of the organisations supporting the public health services in the country by testing human samples for the confirmation of SARS-CoV-2. Public health professionals collect the samples, and well-trained, experienced staff at NVI conduct the tests to detect the virus using the real-time RT-PCR method. Testing is performed daily, including at weekends, and the staff involved in testing are hosted at the Institute’s guest house facilities.

Community based testing

The Government of Ethiopia has launched the Community-Based Activity and Testing (ComBAT) Campaign, where a substantial number of human samples are being tested from the community to assess the level of infection. The NVI is fully engaged in this campaign. The testing of samples from suspected cases, individuals who may have come into contact with the virus, and from hospitalized follow-up patients is still on going.

The NVI sincerely thanks and acknowledges the Animal Production and Health Laboratory (APHL) of the Joint FAO/IAEA Division for its significant support and for supplying the CFX96 Touch™ RT-PCR Detection System-BioRad in 2013 and PIKOREAL 24 Real Time PCR System-ThermoScientific in 2017, now being used for COVID-19 testing.

NVI is highly committed to contributing to the global efforts targeting the development of safe and effective COVID-19 vaccine.
NAHDIC CONTINUES TO SUPPORT HUMAN COVID-19 TESTING

By: Dr. Tesfaye Rufael, Director General, NAHDIC

The number of people that need to be tested for COVID 19 continues to overpower public health facilities and laboratories that perform tests. Thus, Ministry of Agriculture of Ethiopia has mobilized those national reference veterinary diagnostic laboratories with adequate staff and infrastructure to support the public health with its COVID-19 testing needs.

As of early April 2020, laboratory capacity assessments were carried out by both World Health Organization (WHO) and Ethiopian public health laboratories (EPHI) experts to expand the capacity of the COVID-19 testing laboratories. They recommended National Animal Health Diagnostic and Investigation Center (NAHDIC) should test human samples of COVID-19, as the laboratory personnel have a deep expertise and experience so could move quickly to help with the testing process. This move increased the volume of COVID-19 testing available in the country.

NAHDIC has been testing COVID-19 testing samples collected and transferred by EPHI and Oromia health centers since March 31, 2020. It has increased analysis capacity from 100 samples to 1,000 samples per day and the results are available to EPHI and Oromia Health bureau within 24 hours.

The samples are collected from Addis Ababa and Oromia within and surrounding Sebeta for community surveillance, contact history, suspected cause, follow up patients and passengers. NAHDIC has now processed over 45,000 human samples of which about 4.3% were positive for COVID-19.

The center is among the top five COVID-19 testing laboratories in the country on daily basis. NAHDIC is primarily equipped to test samples from animal origins, but it has the infrastructure – including real time PCR testing and nucleic acid extraction instruments – to perform molecular diagnostic tests to determine the presence of COVID-19 genetic material in samples taken from human beings.

NAHDIC found that the COVID-19 virus has a similar RNA virus molecular testing process to camels Middle East Respiratory syndrome virus (MERS- CoV), another form of corona virus that causes MERS-CoV in human.

Since NAHDIC is equipped to respond to animal disease outbreaks regularly – a similar process and technology can be also

Fig. 1. Sample submission and reception at NAHDIC BSL-3 lab facility (photo by TRC).
applied to human disease testing. The center has a bio-safety level-3 facility and has experience for testing zoonotic diseases such as highly pathogenic Avian Influenza, Ebola, Bovine tuberculosis, Brucellosis, and Anthrax. It is currently able to perform real time PCR diagnostic tests that detect the presence of the COVID-19 virus.

NAHDIC has the necessary infrastructure to test for COVID-19 and has also been accredited for ISO 17025 since 2008 for many molecular diagnostic methods. NAHDIC has obtained certification to perform COVID-19 testing through regular participation in proficiency testing and inter-laboratory comparison with EPHI. These may be used to demonstrate competency to support COVID-19 testing during current health crisis when laboratory capacity and rapid turnaround is crucial for identifying and controlling community spread.

Having a well-established bio-safety system with BSL-3 facility, NAHDIC - together with collaborator organization such as Adama University, EPHI and Wolaita Sodo University - is working to conduct culture and isolation of the virus for clinical trial on herbal medicine to protect against COVID-19. The center further applied for recognition as FAO reference center for coronavirus to do more research and diagnostic activities in collaboration with FAO member countries.

Fig. 2. Laboratory Technologists of NAHDIC, preparation for the COVID-19 virus in samples from humans in the bio-safety level-3 laboratory (photo by TRC).

Fig. 3. Lab personnel of NAHDIC conduct PCR assays for COVID-19 virus in humans (photo by TRC).
In Ethiopia, the livestock sub-sector plays a vital role in ensuring food security, provision of traction power, generation of rural income and employment at the household level as well as national economic growth through foreign exchange earnings and many other benefits. However, the contribution of this resource to the national economy remains incommensurate to the huge national potential, mainly due to the widespread prevalence of many infectious and parasitic diseases which drastically reduce the production and productivity of livestock through morbidity, mortality and market restrictions.

Moreover, currently natural disasters impose significant negative impact on the livestock sector and more specifically on animal health services. Particularly, the COVID-19 pandemic has been causing unprecedented crises to the lives and livelihoods as well as socio-economic systems worldwide. The socio-economic impacts being felt across Ethiopia are believed to be wide-ranging and serious, with the potential to become severe, depending on the combination of the pandemic’s trajectory, the effects of counter measures, and underlying structural factors.

On the other hand, the nation has been experiencing other disasters, including desert locust infestation and heavy rainfall which led to flooding in several parts of the country. There is increasing evidence and field observations indicating the immediate impacts of these additional crises, worsening the already staggering socio-economic developments, including the livestock sub-sector.

In light of this, on 26th of November 2020, the Ethiopian Veterinary Association (EVA), in collaboration with the International Livestock Research Institute (ILRI) and other partners, successfully organized a virtual national conference with the theme: “Current Natural Shocks and their Implications on Livestock Development and Animal Health in Ethiopia”.

H.E. Dr. Fikru Regassa, State Minister, Ministry of Agriculture, was guest of honor and officially opened the conference. Key presentations were delivered showing the scale, nature and depth of the detrimental impacts of COVID-19, flooding and desert locust on the livestock sector and animal health service. Close to 86 participants attended the conference.

The first presentation was delivered by Dr. Ermias Alemu, from the Ministry of Agriculture, on ‘Impacts of COVID-19 pandemic on livestock development and Animal Health Service in Ethiopia’. In his presentation, Dr. Ermias indicated that, COVID-19 is reported to have affected the national animal disease surveillance system (NADSS), disease prevention, control and inspection activities (including laboratory diagnostics, veterinary medicinal supply chain, and vaccination), meat export and other capacity building programs. In the poultry sector in particular, the pandemic has reduced access to inputs, feed, market of the industry, and storage facilities. Furthermore, it has significantly affected manpower engaged and employed by the sector.

At the end of his presentation, Dr. Ermias put forward several recommendations including:

- Provision of guidelines for COVID-19 control and prevention along the supply chains
- Organization of grouped slaughtering points and support for the installation of cold chain facilities
- Support market linkage, finance and access to foreign currency
- Promotion of poultry egg and meat consumption
- Priority should be given to the poultry sector and a compensation policy should be put in place to support the industry
- Development partners should work together with value chain actors in order to create better working conditions
- Detailed COVID-19 impact over the livestock sector has to be studied.

Dr. Tesfaye Rufael then shared the experiences of the National Animal Health Diagnostic and Investigation Center (NAHDIC) in the fight against COVID-19 in Ethiopia. In his presentation, he explained NAHDIC has been providing a testing service and reporting COVID-19 cases in...
humans, and has been providing support to control the pandemic in the community. Furthermore, the center has been providing various contributions beyond COVID-19 diagnosis by conducting further research on transmission dynamics, pre-clinical trials on traditional drugs and assay developments on COVID-19. (See pages 2 and 3 for more details).

Dr. Gijs van’t Klooster (FAO) delivered the next presentation on ‘Impacts of desert locust infestation on rangeland (pastureland) and the livestock sector’. Dr. Gijs indicated that, the current desert locust invasion is the worst in 25 years and by February 2020, six regional states – Afar, Amhara, Oromia, Somali, Tigray, and SNNP plus Dire Dawa –were affected. The infestation resulted in large-scale crop, pasture, and forest cover losses, causing worsening food and feed insecurity. This has resulted in an increase in cereal prices by about 50% from the previous year.

Livestock condition decreased due to reduced grazing/browsing and there was stagnant or falling livestock prices which eroded the resilience of livestock keepers. The condition was further compounded by COVID-19 restrictions which has reduced market demand for livestock and livestock products. At the conclusion of his presentation, Dr. Gijs recommended the need to establish a more quantitative system of monitoring and reporting vegetation loss, livestock body condition and national capacity-building to improve surveillance for locust.

Dr. Temesgen Tadesse (National Disaster Risk Management Commission), concluded the presentations with ‘Heavy rainfall, Flooding and their impacts on livestock sector and livelihoods’. Dr. Tesmesgen indicated that heavy rainfall and floods had significant effects on the livestock sector and livelihoods in Ethiopia. These include:

- Animals being swept away by heavy rainfall/flooding, leading to loss of livelihood of farmers and ultimately food insecurity. For instance, in the Afar region 4,044 animals were taken away when The Awash overflowed.
- Grazing pasture inaccessibility due to coverage of range land by flood resulting in shortage of pasture.
- Threat of potential livestock disease outbreaks, including Anthrax and vector borne diseases. This is further aggravated by lack of vaccines, veterinary drugs and equipment supplies for those animals impacted by flooding.

Some response/mitigation approaches were followed which included: activation of disaster emergency coordination centers at different levels to coordinate emergency responses, disaster risk management mainstreaming, putting in place comprehensive early warning system to alarm actors on potential risks of hazards through regular monitoring, and implementation of post disaster/rehabilitation strategies like re-stocking, maintaining damaged facilities/constructing new for lost.

Following the conclusion of the presentations, participants discussed and agreed on the following resolution points:

- Animal health professionals are highly recommended to strengthen and work through the One Health Platform in protecting the wellbeing of humans, animals and the environment. This requires the collaboration of Ministries (Health, Agriculture) and Environment, Forest and Climate Change Commission.
- There is a need for strong collaboration on research aimed to build evidence-based knowledge and identify/predict the impact of natural disasters on livestock resources.
- Animal health professionals are highly advised and encouraged to acquaint themselves with and implement national disaster risk management framework, mainly particular to the livestock resource (livestock early warning and livestock emergency guidelines).
- Ministry of Agriculture in collaboration with disaster risk management commission need to revise the national livestock resource development emergency manual.
- Professionals working in the livestock sector need to identify key and threatening natural disasters, and provide the proper capacity building (training) to livestock producers, private sector and the community on their potential impacts, so that proper prior mitigation measures are taken.
- It is highly important to understand the potential and significant role of animal health services in enhancing resilience to drought and bringing about sustainable development. In this regard, veterinary professionals are advised to identify key development gaps and engage actively in providing their professional contribution.
Antimicrobial resistance (AMR) is a growing concern threatening the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. AMR is said to have occurred because microorganisms change over time and no longer respond to medicines, making infections harder to treat and increasing the risk of disease spread, severe illness and death.

In Ethiopia a national AMR baseline situation assessment documented that most microorganisms (bacteria) that are commonly involved in causing infections in human beings and animals showed a considerable degree of resistance to commonly used first-line antimicrobials. This situation calls for strong regulatory measures to ensure quality of veterinary services, prudent use and stewardship of antimicrobials, good farming practices, use of vaccinations and alternatives to antimicrobials along with improved biosafety and biosecurity in rearing healthy animals.

In line with the above fact, the Ethiopian Veterinary Association (EVA) in collaboration with partners and through the financial support of South Center International organized and conducted an awareness raising campaign during the World Antimicrobial Awareness Week (2020) on AMR and Antimicrobial Use (AMU), from November 18 – 24, 2020.

As part of the campaign, a virtual workshop was organized and 70 participants attended the event. Participants had successful dialogue on current progress and the challenges of AMR in Ethiopia and possible contributions of veterinary service on its containment and prevention.

The event was officially opened by Dr. Edmealem Shitaye, President of EVA. Dr. Edmealem, in his speech, highlighted the fact that the veterinary service in Ethiopia has been constrained by growing challenges attributed to resistance development against the current antimicrobials and that there is urgency for stronger collaboration among partners to sustainably address the matter. He also indicated that veterinary service providers are strongly encouraged to more than double their efforts to help the poor rural communities in tackling these challenges.

Following the official opening, four presentations were delivered by panelists on timely topics complimenting AMU and AMR.

The first presentation was delivered by Mr. Tenaw Tadege from FAO - Ethiopia, on ‘AMR in the context of COVID-19 pandemic: current situation, challenges and the way forward’. In his presentation, Mr. Tenaw indicated the need to work under a One Health Platform to tackle AMR and boldly suggested the following recommendations:

- Enhancing surveillance on antimicrobial use, residues and AMR
- Effective vaccination to prevent outbreaks of disease
- Identify gaps to respond to COVID-19 and AMR
- Build evidence and generic interventions for scale up
- Apply alternatives for MDR treatment and ensure continued health services
- Avoid substandard and falsified products
- Implementation of legislation on AMU/ AMR and Review existing policies or any other relevant regulatory framework.

Another interesting presentation was delivered by Dr. Tafesse Mesfin from Ethiopian Society of Animal Production (ESAP)-Natural Livestock on ‘The roles and opportunities of Ethnoveterinary practice in the prevention and containment of AMR’. In his presentation, Dr. Tafesse briefly shared experiences of other countries and Ethiopia with regards to Ethnoveterinary, existing challenges of AMR, the use of medicinal plants in animal health, and best practices in the use of medicinal plants for treatment of animal diseases. In his recommendation Dr. Tafesse underlined the need for attitudinal change regarding Ethnoveterinary medicine, adoption of practices of other countries, documentation of locally available community knowledge, institutionalization of Ethnoveterinary, and inclusion in Veterinary Curriculum and research programs.

The third presentation was made by Dr. Abel Bulamu from University of Surrey, on ‘Antibiotic Use Practices and Stewardship in Ethiopia’. It was based on a survey conducted on veterinarians and para professionals in Ethiopia. Key
recommendations forwarded from the presentation include:

- Capacity building / CPDs for vets and para-professionals on appropriate antibiotic use practices and use of laboratory diagnostics
- Incorporate AMR in the training of animal health professionals as well as medical and public health professionals
- Develop reliable and up-to-date informational sources to guide vets and para-vets on antibiotic use
- Actively promote and disseminate formally-issued government guidelines on antibiotic use.

The final presentation of the day was made by Dr. Hayat Seid, from Veterinary Drug and Animal Feed Administration and Control Authority (VDFACA) on the title ‘Antimicrobial Resistance in Animal Health’.

In her presentation Dr. Hayat highlighted VDFACA’s role in the prevention and containment of AMR. These include:

- Awareness creation to animal health professionals, media and the community regarding AMR
- Surveillance and research on various aspects of AMU and AMR
- Capacity building program for animal health, food safety and environment labs and professionals
- Development of Ethiopian veterinary medicine list, various manuals, training and BCC resources, and guidelines to help in veterinary pharmaceutical management, treatment of animals and disposal of unfit for use medicines and animal feeds.
- Collaborate in One Health legislation gaps review relevant for AMU, AMR and containment
- Developed integrated plan for AMR and residue surveillance in animal health, plant, food safety and environment sectors
- Revising strategy and national action plan for containment of AMR, and establishment of AMR advisory committee.

After all the presentations were completed, participants held important discussion based on the presented articles and general facts. Key points raised during the discussion were:

- Surveillance on AMU and AMR, residue and contaminants is essential to study the magnitude and trends to make informed decision and policymaking, and also to see if there are changes due to interventions. This also can be used to convince policy makers
- Stronger national research for investigation, testing and evaluation system for veterinary drugs
- Due attention should be given to Ethnoveterinary in Ethiopia
- There is need to preserve medicinal plants by securing land, and at the same time promote and empower the untapped indigenous knowledge
- Institutionalization of Ethnoveterinary is prior importance. Academia and research institutes should embrace Ethnoveterinary and association like EVA and ESAP will have a huge role in this regard
- In terms of improving antimicrobial stewardship, farmers need to be given the proper attention, as most of the time they are direct users of antimicrobials. They should be considered in any AMR prevention and containment strategy
- Clear information should be provided on substandard drugs to all users for their information and action
- The COVID-19 pandemic taught us a lot and as a result there’s a need to

Dr. Edmealem Shitaye, gave his concluding remarks and highlighted that:

- Assessment should be made to identify contributing factors in various production patterns across the country and the implication for AMR
- Veterinary professionals are highly advised to follow strict diagnostic and treatment procedures in rational manner. In areas where possible, antibiotic sensitivity should be conducted
- Stronger research and surveillance is required on AMR to build knowledge and acquire enough evidence to help to advocate on the impacts of AMR to policy makers for better mitigation strategies
- Collaboration and harmony with Ministry of Health and other partners in the fighting against AMR at a national level embarking on One Health approach. Synergy required in reaching grass root level
- Institutionalization of Ethnoveterinary under the Ministry of Agriculture, while documentation and operationalization of Ethnoveterinary practices in the country.
African Livestock Productivity and Health Advancement

Now in its fourth year, the Zoetis A.L.P.H.A. initiative has dramatically improved livestock health and farmers’ livelihoods in Sub-Saharan Africa.

Advancing care
Access to medicine and technology is at the heart of our sustainable development goals.

656,000
diagnostic tests performed overall, with 1970 diagnostic kits sold to date

1.7B
doses of vaccines and medicines have been administered over 4 years

20x
more products submitted for registration approval than originally available—from 4 to 85

Expanding access
Establishing new facilities ensures the sustainability of animal health and economic development.

10 labs
are fully operational for local veterinarians in our target regions

978
professionals including laboratory personnel trained on diagnostic topics via face-to-face and virtual masterclasses

Scaling impact
Shifting to digital trainings had a positive impact, expanding the reach of training activities.

13,234
farmers, veterinarians and paraveterinarians were trained overall

657,800+
people reached via the train-the-trainer programs provided

579
representatives attended distributor training through 2020

Regional Update
Population demographics
1 icon = 10 million

Ethiopia
13
products now available, in a region with zero Zoetis presence before 2019

50+
veterinarians joined virtual World Antibiotic Awareness week workshops

Poultry Aid
A new agreement signed between Jimma University and Vetmedu Vienna with support of Zoetis forming an extension to the Poultry Centre of Excellence

2017

2050

Keeping livestock is an essential source of income for nearly 600 million households

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