

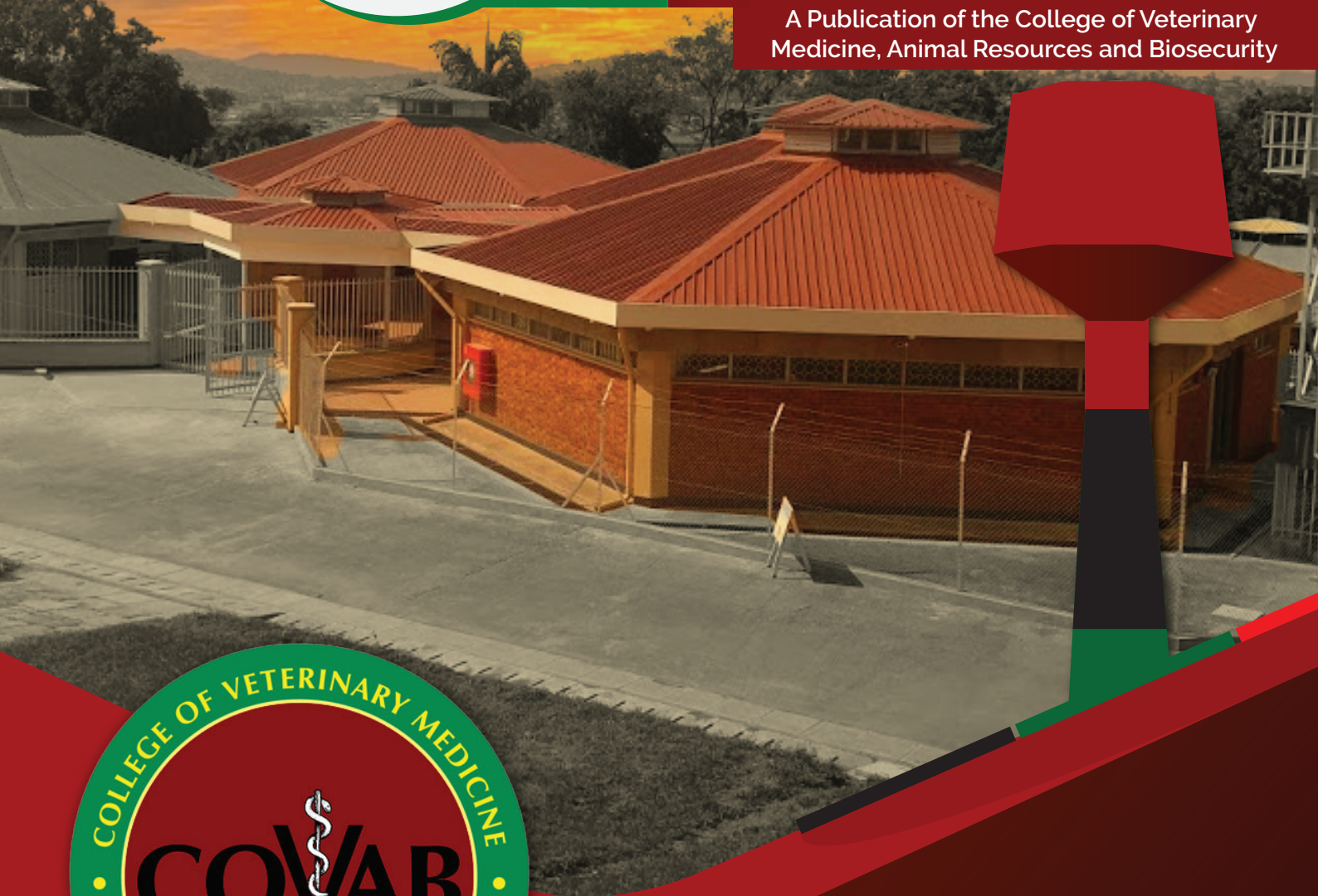


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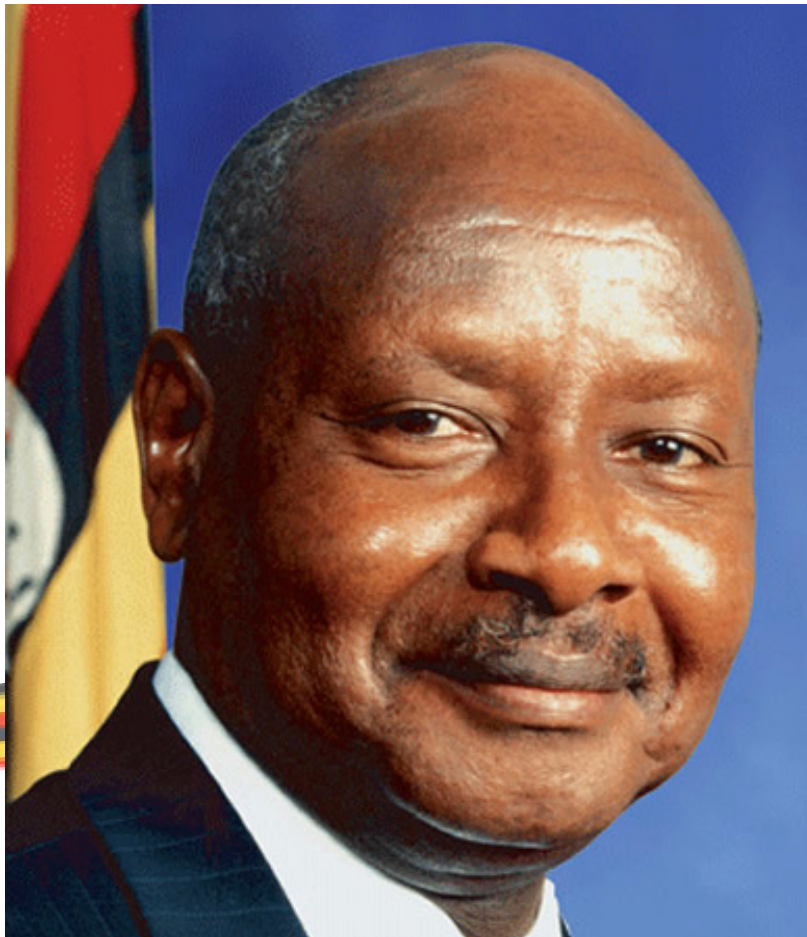
A Publication of the College of Veterinary Medicine,  
Animal Resources and Biosecurity



## COVAB ABRIDGED ANNUAL REPORT 2020

MAKERERE UNIVERSITY COLLEGE OF VETERINARY MEDICINE,  
ANIMAL RESOURCES AND BIOSECURITY

[www.covab.mak.ac.ug](http://www.covab.mak.ac.ug)



H.E Gen. Yoweri Tibuhaburwa Kaguta Museveni  
President of the Republic of Uganda and the Visitor to Makerere University





Hon. Janet Kataaha Museveni  
First Lady and Minister of Education and Sports.

# University Administration



Professor Ezra Suruma  
*Chancellor, Makerere University*



Mrs. Lorna Magara  
*Chairperson, University Council*



Professor Barnabas Nawangwe  
*Vice Chancellor, Makerere University*



Makerere University





# College Administration



Professor John David Kabasa  
PRINCIPAL, COVAB



Associate Professor Samuel Majalija  
DEPUTY PRINCIPAL, COVAB



Associate Professor Robert Tweyongyere  
DEAN,  
SCHOOL OF VETERINARY MEDICINE & ANIMAL RESOURCES



Associate Professor Frank Mwiine.  
DEAN,  
SCHOOL OF BIOSECURITY, BIOTECHNICAL &  
LABORATORY SCIENCES

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# Foreword

**W**e are pleased to present to you the 2020 report. This abridged version highlights select achievements of our University College.

The year AD 2020 was unique and historical; being the era when COVID-19 pandemic struck the entire global civilization and crushed many local economies. AD 2020 has thus, been a turning point, literally, shaking everything. Our systems were laid bare; and adjustment to a new normal became urgent. Despite this assault, we shall be forever grateful, that our scientists, technocrats, administrators and support teams, wriggled through; emerging with certain key outputs, which we have been able to share here. The teams kept focused on accelerating efforts for advancing Makerere

University's vision of being the number one leading institution for academic excellence and innovations in Africa. We have continued to place emphasis on building skilled human capital while driving transformative research and innovation, teaching, learning and service. As you will find in subsequent sections, despite the pandemic ecosystem, AD 2020 was marked by vital initiatives at the college. We received considerable support from the Government of Uganda, local and international partners.

The college vision of continuously creating a healthier, wealthier and safer society through animal value, was thus greatly reinforced. We have strengthened blended learning approaches, putting more emphasis on E-Learning programs as a way of not

only controlling COVID-19 virus spread, but also as a mechanism for enhancing access to education. It has been exciting to see both students and staff graciously embrace the e-system under a new normal, challenges notwithstanding.

With pride therefore, we wish to salute the Government of Uganda, university administration, our staff and partners; recognize the sacrifice, service, value and impact of the work we have attained together. Without this contribution, the drive towards building COVAB as a new generation of veterinary colleges in Africa and beyond would not have been realized.

May the Eternal God forever bless you all.

For God and My Country! As We Build for the Future!

*Prof. John David Kabasa*

PRINCIPAL COVAB





## **MISSION**

To Drive Transformative Knowledge,  
Skills, Innovations and Services for  
the Continuous Improvement of  
Society

## **Vision**

Healthier, Wealthier and Safer  
Societies Through Animal  
Value





# 1. RESEARCH AND INNOVATION

“

*“.....The challenge for African scientists is how to demystify and domesticate research and innovation into our institutions and learner communities.....”*

*“Research ... is nothing but a state of mind-a friendly, welcoming attitude toward change; going out to look for a change instead of waiting for it to come. Research, for practical men, is an effort to do things better.....”*

Charles F. Kettering



# INTRODUCTION

Despite the COVID-19 pandemic that continues to challenge the world, COVAB Scientists are even much more established in contributing to the veterinary, as well as human health sector through research.

## 1.1 RESEARCH INITIATIVES

**1.1.1. Initiative for Enhancing Efficiency of Emerging Meat and Protein Value Chains from Edible Insects in Uganda. (Lead Scientists -Dr. Claire Mugasa and Prof. John David Kabasa)**



The Principal of the College, Prof. John David Kabasa (first on the left) together with the VERIF Project team pose for a group photo during the inception meeting.

Makerere university researchers got their enthusiasm much higher in promoting food security. This was showcased on 1st December 2020 when an inception meeting on the Enhancement of Efficiency on emerging Entomic (insects') meat and protein Value Addition in Uganda project was held at the COVAB.



Dr. Claire Mugasa, the Principal Investigator for the VERIF Project giving her remarks during the project inception Meeting in the Principal's Board Room.

The Project envisages advancement in technology and innovations in entomic (insects') meat to improve livelihoods in Uganda, fronting Grasshoppers (Nsenene) a delicacy for many as food, and the black soldier Fly as a feed for animals.

## 1.1.2. Initiative for Controlling Antimicrobial Usage in Uganda's Livestock Farming Systems (Lead

Scientist -Associate Prof. Lawrence Mugisha)

Antimicrobial usage is one of the public health challenges which Uganda is currently grappling with.



Associate Prof. Lawrence Mugisha

Therefore, COVAB scientists found the need to end this challenge through the creation of a monitoring and quantifying IT system to map out antimicrobial usage by livestock farmers.

*This project titled; Developing a Monitoring System for Quantifying and Mapping Antimicrobials used in Livestock Farming Systems in Uganda was launched on 30th September 2020 at the college Center for Biosecurity and Global health. It is spearheaded by Dr. Lawrence Mugisha.*

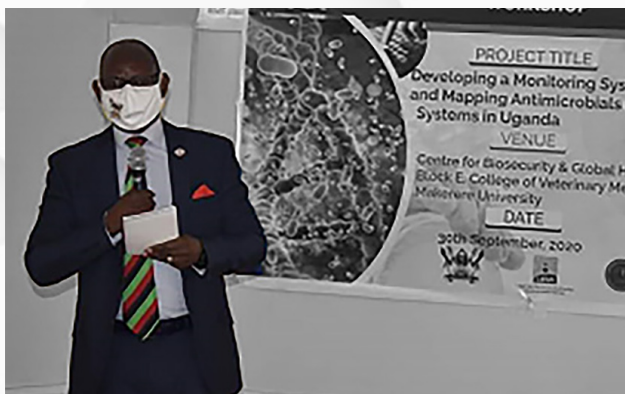


Prof. Barnabas Nawangwe, Prof. John David Kabasa and Dr. Lawrence Mugisha (in the middle) together with project stakeholders pose for a group photo during VAMS Research and IT System Launch at the College Center for Biosecurity and Global Health





A section of Participants in the VAMS Research and IT System's Project Launch at the College Center for Biosecurity and Global Health.



Prof. Barnabas Nawangwe (left) and Prof John David Kabasa (right) making their remarks during the VAMS Research and IT System's launch at the College Center for Biosecurity and Global Health.

### 1.1.3. Launching the Research Laboratory for Tropical Disease and Vector Control - RTC Laboratory (Lead Scientist -Dr. Vudriko Patrick)

With continued contribution towards the Veterinary sector, COVAB Scientists officially launched the Research Center for Tropical Diseases and Vector Control (RTC) diagnostic Laboratory on 20th February 2020.

The ceremony was officiated by the Commissioner Animal Health in Uganda, Dr. Anna Rose Ademun. The event was coupled with a courtesy visit to COVAB by the Makerere University Deputy Vice Chancellor



Dr. Anna Rose Ademun (left) officially launching the RTC Diagnostic Laboratory. With her stands Associate Prof. Robert Tweyongyere (middle) and the head of RTC Diagnostic Laboratory, Dr. Patrick Vudriko (right).





*Delegates at the launch of the RTC Diagnostic Laboratory pose for a group photo at Makerere University.*

for Research and Academic Affairs, Associate Prof. Umar Kakumba, who had a cordial meeting with the Dean School of Veterinary Medicine, Prof Robert Tweyongyere together with Dr. Eric, a representative from Zoetis A.L.P.H.A.

With support from Zoetis A.L.P.H.A. Initiative, the Research Center for Tropical Diseases and Vector Control (RTC) Diagnostic Laboratory was established to offer a wide range of new diagnostic services for poultry, ruminants, swine and pets. The new laboratory also offers vaccination efficacy monitoring tests to assure that poultry, cattle and pets that are vaccinated have the right amount of antibodies to protect them against diseases. Feed processors and farmers can also get mycotoxin analysis from feeds at this diagnostic laboratory. It also strives to offer quality diagnostic services at affordable cost with client satisfaction as a priority.

Associate Prof. Umar Kakumba (DVC AA) was

also delighted to be showed around different facility developments in the Research Center for Tick & Tick borne Disease control (RTC) that has acquired high quality serology equipment, with aid from the Japanese international cooperation Agency and Zoetis A.L.P.H.A. Part from Tick acaricides the facility also test feeds for mycotoxin.



*Associate Prof Umar Kakumba (DVC AA) (right) in a meeting with Associate Prof. Robert Tweyongyere (middle) and Dr. Eric (left).*





## 1.1.4. Initiative for Paratuberculosis Vaccine development *(Lead Scientist -Associate Prof. Okuni Julius)*

**O**n 14th February 2020, the Germany Embassy paid a courtesy visit to COVAB in a bid of drawing more strategies of successful furthering of the Para-Tuberculosis Research. Spearheaded by COVAB, the partnering veterinary researchers were seeking to find a vaccine for Paratuberculosis. Paratuberculosis is a domestic ruminant disease that is also suspected to have links with the crohn's disease in humans caused by the Mycobacterium Paratuberculosis.

The project brought on board different stakeholders

including University of Göttingen, University of Khartoum, Ibn Sina Specialized Hospital, Sudan and different veterinarians across the continent.

On 10th February 2020, the DFG Project on Infectiology held a workshop to share ideas on the control of Mycobacterium Paratuberculosis in Africa, at Protea- by Marriot Hotel, Entebbe.

The Vice Chancellor, in representation by Prof. John David Kabasa applauded the Evolution of Mycobacterium

Paratuberculosis Project for ensuring that the environment where the farmers and his animals are, is safe and clean. "Farmers must be prosperous and have employment from their animals. This project is very important and critical for the development of farmers and employment of people," stated Prof. Kabasa.

On giving a brief background of the Winter School, Dr. Ahmed Ab El Wahed emphasized the strong need for collaboration with farmers and policy makers to



*The Chief Veterinary Officer and Commissioner Animal Health, MAAIF, Dr. Anna Rose Ademun pose for a photo with the German Research Foundation delegates and Makerere University Collaborators*

what they need.

The Deputy Director, Directorate of Research and Graduate Training, in representation by Dr. Robert Wamala applauded the German Research Foundation for sponsoring this initiative. He further commended Makerere University's Vice Chancellor and Ugandan Government for strongly supporting research.

The Principal, COVAB, who was represented by Associate Prof. Samuel Majalija, appreciated the German government for supporting African activities. He as well commended the One Health Agenda which is applied in addressing African problems.

The Dean School of Veterinary Medicine COVAB, Associate Prof. Robert Tweyongyere informed delegates that farmers with diary animals face a lot of Paratuberculosis

challenges which needs real time diagnosis. He therefore implored upon collaborators to extend solutions to this problem across all regions in Africa.



*“Correct treatment requires a correct diagnosis.”*

In representation by Prof. Joseph Erume, the Head of Department Biomolecular Resources and Biolab Sciences he termed Paratuberculosis as an

insidious agent which requires joint effort to be addressed.

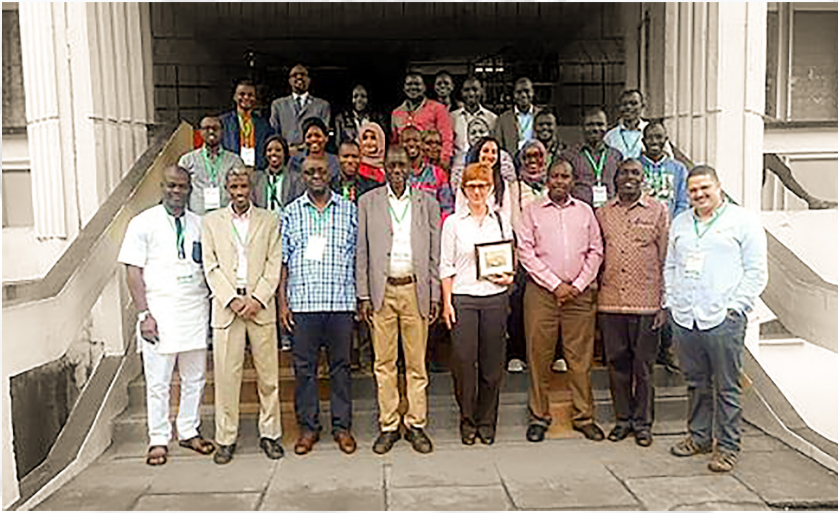
“In 1990, we encountered an experience where two zero grazing units in Kampala closed down due to Paratuberculosis. As a department, we are happy to host this gathering which is a great opportunity to engage with different stakeholders to devise ways of controlling this disease,” stated Prof. Erume.

The Evolution of Mycobacterium Paratuberculosis Initiative is one of the German-African Cooperation Projects in Infectiology, funded by the German Research Foundation. According to Associate

Prof. Okuni's 2013 scientific research, Mycobacterium avium subspecies paratuberculosis (MAP) is an emerging pathogen in many livestock and wildlife populations around the world.

Concerns range from the serious economic impacts





*Delegates from the Germany Embassy, together with other researchers pose for a group photo at CoVAB on 14th February 2020.*

on livestock productivity livestock. to its suspected role in the human inflammatory bowel disease syndrome. Milk and stool of infected animals are the main vehicles through which the organism spreads from infected to susceptible hosts. Infection with this microorganism results in substantial farming economic losses and animal morbidity.

The convention brought together scientists from different African countries, Academia, Policy makers, students, and the media, who brain stormed ideas on how to suitably address the issue of paratuberculosis in Africa's

*As the Guest of Honor, the Chief Veterinary Officer and Commissioner Animal Health, MAAIF, Dr. Anna Rose Ademun as well appreciated the German Research Foundation and CoVAB for their endeavors on addressing health issues pressing the African continent.*

She further informed delegates that government rolled out several programs to address issues in the ecosystem. She added that Paratuberculosis never gets

enough attention and this form informs the government to include the neglected sector.

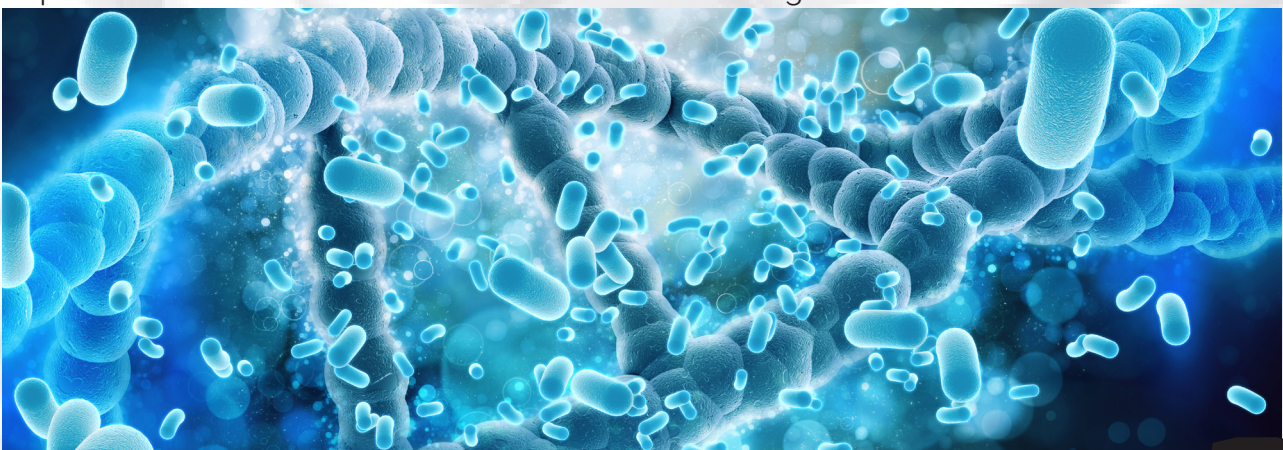
"Paratuberculosis as a zoonotic disease tends to hit us away in silence. Therefore, we need to rearrange our priorities in zoonotic diseases control. The joint strength exhibited in this meeting gives hope that this issue will be addressed," said Dr. Ademun.

The coordinator of the 2020 Winter School workshop,

Associate Prof. Julius Okuni welcomed all delegates.

He further informed them of project's collaboration with the Government of Uganda, which has provided policy to see that Paratuberculosis among the country's livestock is addressed.

He also reported that this workshop was one of his milestones in graduate trainings, as they build capacities among farmers to address the issue.









## 1.1.5. Pigboost Project to Empower Pig Farmers in Uganda Launched *(Lead Scientist -Associate Prof. Clovice Kankya)*



Collaborative partners from UK; AbacusBio and University of Edinburgh together with Vetline Services and Makerere University in Uganda held an inception workshop for the PigBoost Project, which ran from 20th to 22nd January 2020 at Ridar Hotel, Seeta Mukono District.

The workshop was coupled with visits to pig farmers in Mukono District on 22nd January 2020 for a pig tagging initiative. The pig tagging initiative is one of PigBoost's data driven activity which will influence pig farmers' decisions to improve Uganda's pig production, health, and welfare. It will also inspire proper management of smallholder pig farms

through accurate recording of breeding, production and disease data.

Under its organization by the Department of Biosecurity, Ecosystems and Veterinary Public Health (BEP), Makerere University, the workshop was based on the theme; Sustainable data driven pig production for Uganda.

The PigBoost project focuses on digital transformation of the Vetline pig Artificial Insemination (AI) business and the pig production supply chain, which is digitized for accurate recording of breeding, production and disease data. It is funded by the Government of UK through Innovate UK.

The meeting commenced with opening remarks from the Commissioner Animal Health- Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Dr. Anna Rose Ademun, who was represented by Dr. Robert Mwebe, a Senior Veterinary Officer at MAAIF.

In her remarks, she appreciated the PigBoost project, mentioning that it will address a number of issues in the pig production industry. She added that MAAIF is committed to improve animal production, health, and extension services.

The Commissioner affirmed the need for private partnerships to achieve this improvement in the animal industry. She honored the PigBoost project's focus, assuring that the improvement of data shows that this project is timely, since farmers need to know the different breeds of pigs. She also informed delegates that the Ministry is committed to improve the nutrition of animals. Pig farmers will also be informed about the best feeds for pigs and also get to know about the genetic improvements through





Artificial Insemination. While she officially opened the meeting, Dr. Ademun concluded her remarks by thanking all the development partners in the PigBoost Project. On behalf of the Ministry, she committed herself to work hand in hand with the project's development partners for a positive achievement in the assessment of pig products. She also guaranteed that this partnership will ensure that the use of drugs is controlled in the animal industry to address concerns of Anti-

He petitioned the Government of Uganda to ensure that technical expertise is enhanced in every district. Vetline Services is an agricultural consultancy firm, with preference towards the pig industry. It uses innovative technologies and services that include pig artificial insemination, no-smell, no-cleaning method of pig rearing.

The Managing Director of AbacusBio International, Dr. Timothy Byrne together with a Consultant from AbacusBio,

actors such as scientists, farmers, technicians, veterinarians, and business managers from Uganda, New Zealand, and the United Kingdom to share ideas on how to boost data recording for farm performance benchmarking, genetic and animal health improvement, as well as disease management in Uganda.

The PigBoost tool was developed from the existing Dtreo data platform, developed by AbacusBio, which is an agri-business firm. Breeding records and delivery of artificial insemination services by Vetline Services will be digitized allowing accurate recording of breeding, production and disease data. Data will then be used to benchmark individual farm performance and provide feedback to farmers.



*Dr. Robert Mwebe reading out the Animal Health Commissioner's remarks to delegates during the PigBoost Inception Meeting on 20th January 2020 at Ridar Hotel Mukono District.*

#### Microbial Resistance.

The Executive Director of Vetline Services, Dr. Leonard Kawule recognized the Government of Uganda for their support in developing his career as a Veterinarian at National Animal Genetic Resource and Data Bank (NAGRC&DB). He assured delegates that pig farmers need a system that easily blends with them which the PigBoost Project will avail.

Dr. Bruno Santos introduced the PigBoost project and its tool, DTREO, which will help to monitor pig production performance in Uganda. Dr. Byrne informed delegates that AI technicians and pig farmers will be trained on how to use this tool, which will also serve as an early warning system regarding issues on pig farms in the country. The three day workshop brought together pig production supply chain



*A pig tagging initiative which was conducted at one of the farms in Mukono District.*



## 1.1.6 Initiative for Development of Bacteriophage Cocktails as Disease Biocontrol Agents for Improved Aquaculture Productivity, Food and Nutrition Safety in Ghana And Uganda (SAFEFISH) - Aurg li-2-225-2018 (Lead Scientist- Dr. Jesca Nakavuma)



**SafeFish**

Duration: 22nd Dec 2018 – 21st Dec 2021

Funding agency: African Union



Dr. Jesca Nakavuma

### ACTION OR PROJECT SUMMARY

The action aims at developing bacteriophage cocktails as fish disease biocontrol agents for improved aquaculture productivity among tilapia farmers, for economic and social development by addressing food and nutrition safety in Ghana and Uganda. The project goal Project is to develop phage products for integrated fish disease management and minimize

antibiotic use in animal production systems through actualizing phage application on the continent.

The project aims at developing bacteriophage cocktails as fish disease biocontrol agents for improved aquaculture productivity among tilapia farmers in Ghana and Uganda. The major project outcome is to enhance fish farm productivity through management of bacterial diseases using a biocontrol agent, which is more specific, safer and cheaper than use of antibiotics. The project implementation duration is three years and activities were embarked on in 2019, however, year 2 funds have not been released probably due to COVID-19 related challenges. Nevertheless, applied for supplementary funds from MAK-RIF II and some year two activities have been embarked upon.

The project is implemented in Ghana and Uganda and the project partners include CSIR- Food Research Institute, Ghana; CSIR-Water Research Institute of Ghana; Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana; Noguchi Memorial Institute for Medical

Research, Department of Electron Microscopy and Histopathology; University of Ghana-Legon; Ghana and Department of Infection, Immunity & Inflammation, University of Leicester UK. National Fisheries Resources Research Institute, specifically The Aquaculture Research and development Center at Kajjansi the affiliated partner to Makerere -COVAB, which is the beneficiary institute.

For Uganda, four undergraduate students have benefited by carrying out their special project research under the project activities; and so far, two MSc students have been involved.

### RESEARCH PARTNERS



Food Research Institute

Water Research Institute



## 1.1.7 Initiative to Assess the Impact of Domestic Dog Ecology on the Spread and Control of Infectious Diseases (Lead Scientist, Dr. Terence Odoch, BEP)



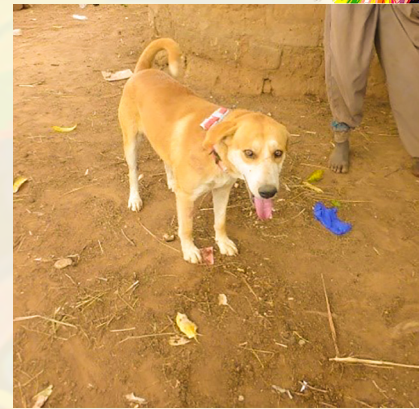
*Dr Terence Odoch presenting the project to stake holders in Kyegegwa district, February 2020*

In 2018, the Veterinary Public Health Institute (VPHI) of the University Bern Switzerland, the College of Veterinary Medicine Animal Resources and Biosecurity (COVAB) of Makerere University, Uganda, the Section of Epidemiology of the Vetsuisse Faculty University of Zurich, Switzerland and International Livestock Research Institute (ILRI), Nairobi signed an MoU for collaborative research.

Within that framework, a research project on free roaming domestic dog (FRDD) ecology was conducted in Uganda, a similar project

was undertaken in Chad, Guatemala and Indonesia. Free roaming dog are implicated in transmission of diseases. The overall aim of the project is to contribute to the control of zoonotic diseases transmitted by dogs. This is being achieved through identifying factors influencing dog behaviors and transmission of infectious diseases particularly rabies. In Uganda, the FRDD ecology project has so far been implemented in Soroti, Masaka and Kyegegwa.

*So far, the implemented activities include mapping movement of dogs using GPS collars in Soroti, collection of blood samples from dogs to analyze for rabies and other zoonotic diseases. Collection of fecal samples for parasitological examinations, and in addition, hair samples for genetic analysis.*



*A dog carrying a GPS collar*

As part of the benefit, community sensitization and education on control of rabies and other zoonotic diseases were carried out in all the study sites, and all participating dogs were dewormed and vaccinated against rabies. Under this project 1 PhD student (University of Berne, Switzerland) and 3 MSc students (Makerere University) are being supported



*Research partners preparing for field activities in Soroti*



*Sample Collection*



## 1.1.8 Initiative for Discovery of Phyto-Biomolecules for Novel Cancer Drugs *(Lead Scientist: Dr. Alice Nabatanzi; Senior Mentor Scientists: Prof. John David Kabasa, Prof. Lyndy McGaw, Prof. Namrita Lall)*

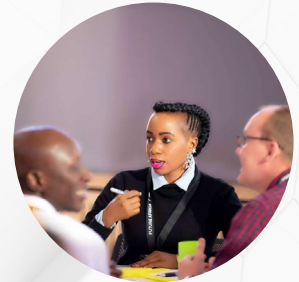


Prof. Namrita Lall,  
University of Pretoria

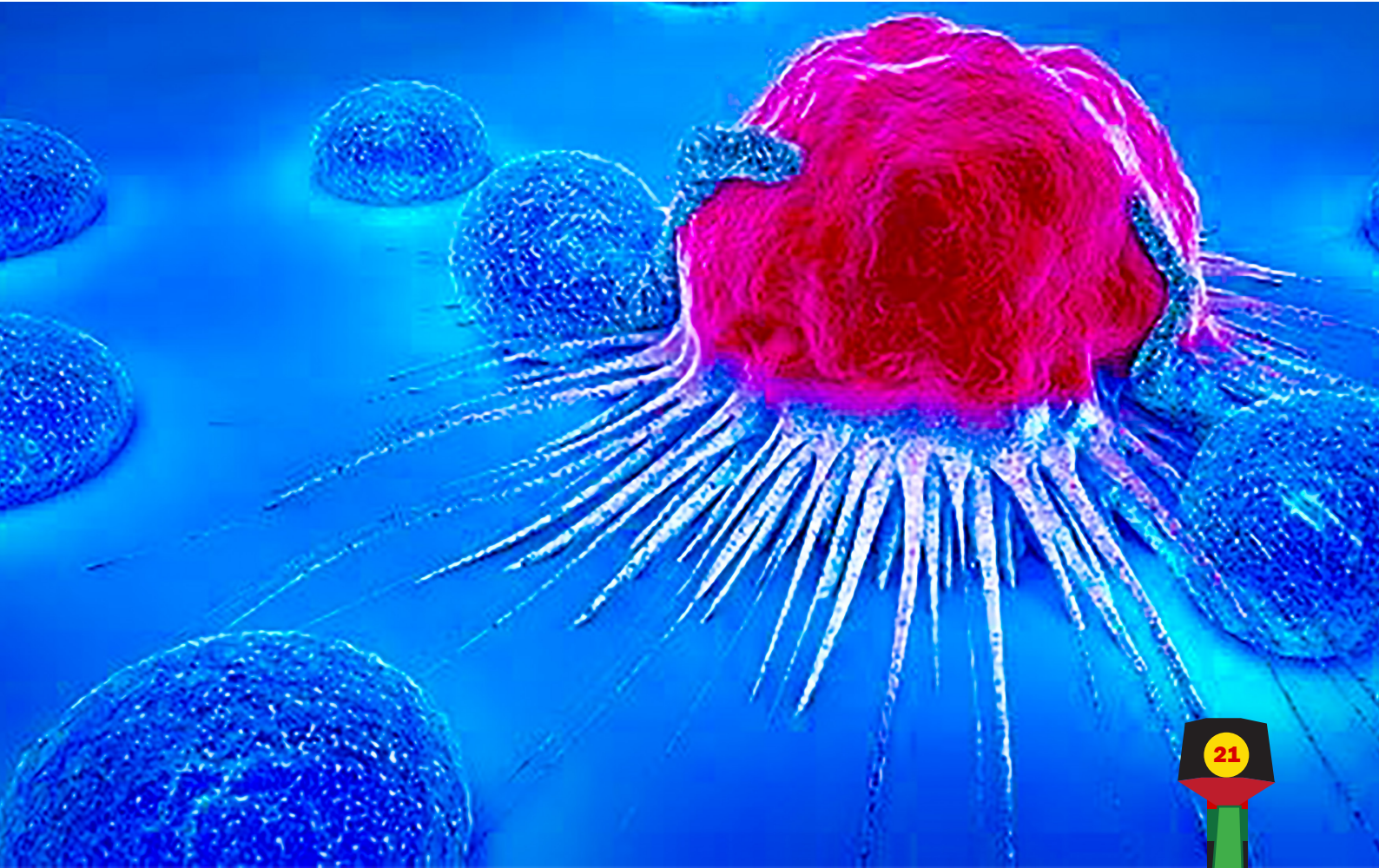
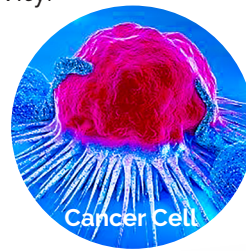


Prof. Lyndy McGaw  
University of Pretoria

This project seeks for phyto-biomolecules with anti-inflammatory and anti-proliferative effects for developing novel cancer drugs. This is a collaborative project between scientists at the University of Pretoria (UP) and Makerere University (Mak). The lead scientist Dr. Alice Nabatanzi works with senior mentor scientists; Prof. Kabasa, Prof. Lyndy McGaw, and Prof. Namrita Lall. The research team has unearthed specific phyto-biomolecules that are safe on vero cells and scavenge free radicals; inhibit the activity of COX-2 and 15-LOX enzymes; inhibit the activity of cytokines (interleukin IL-6, IL-1, tumor necrosis factor- (TNF-) and inhibit the proliferation of human cancer cell lines (MCF-7, HepG2, Caco-2 and A549). The phyto-biomolecules have had no effect on IL-10 activity.



Dr. Alice Nabatanzi  
University of Pretoria





## 1.1.9 Understanding Campylobacteriosis and Transmission Dynamics Using “One Health”, Computational and Systems Dynamics Modeling Approaches (Lead Scientist, Dr. Terence Odoch)



*Dr Terence Odoch*

This Postdoctoral project is being funded by Virginia Tech, Department of Population Health Sciences. It focuses on *Campylobacter*, a major global foodborne pathogen that causes enteric infections. The overall goal of this project is to generate information on the diversity, sources, transmission pathways, geo spatial distribution, and antimicrobial resistance of *Campylobacter* organisms in children and animals in Uganda.

The study is being conducted in Kampala and Jinja. The activities involve collection of fecal samples from poultry, pigs and children. Fecal samples from poultry and pigs are being collected from wet poultry markets and abattoirs, while stool samples from children are being collected from selected health facilities. All the samples are being analyzed at Food Hygiene and Molecular Biology Laboratories at the College of Veterinary Medicine, Animal Resources and Biosecurity (CoVAB).



# 1.2 COVAB Trail in Government Funded Research & Innovation Grants (RIF)



## RIF Projects Won by COVAB Scientists *(Source; RIF Secretariat)*

S/N	PROJECT TITLE	PRINCIPAL INVESTIGATOR
1	Agrochemical Residues in Meat and Milk of Cattle in the Acaricide-Tick-Resistant infested Areas: A Case Study of Gomba District	Dr. Peter Waiswa
2	Antibiotic Usage and Levels of Residues of Antibiotics in Cow Milk in Sentinel Dairy Farms in Mukono District	Dr. Sylvia Baluka Angubua
3	Application of Bacteriophages in the Management of Diabetic Foot Wounds Among Patients attending Regional Referral Hospitals in Uganda	Dr. Alice Namatovu
4	Application of Drone Technology to Support Control of Livestock Movement and Livestock Welfare in Uganda	Prof. Francis Ejobi
5	Assessment of Animal Source Foods Quality and Safety Standards Compliance To Enhance Market Access	Dr. Joseph Kungu
6	Assessment of integrated Control of East Coast Fever (Ecf) By induction of Acquired Immunity in Ankole Cattle After Natural infection By Early Diagnosis and Early Treatment	Dr. Ann Nanteza
7	Assessment of Major Public Health Threats and Zoonotic infections in Free Roaming Domestic Dogs in Selected Districts of Uganda	Dr. Terence Odoch
8	Assessment of the Effectiveness of Newcastle Disease Vaccines in the Ugandan Market and the Evaluation of the Vaccination Schedules Used By Poultry Farmers in the Country	Dr. Zachary Nsadha
9	Assessment of Veterinary Drug Residues in Milk, Chicken and Eggs and Development of A Residue Monitoring Plan For these Foods in Uganda	Dr. John Kateregga
10	Cytokines As Novel therapeutic Agents in the Management of Late Stage Trypanosoma Brucei Rhodesiense Sleeping Sickness: A Preclinical Trial (Cantms)	Dr. Charles Drago Kato
	Deciphering the Virome of Tick Along the Wildlife-Livestock interface	Dr. Eddie M Wampande
11	Developing A Community-Based Model For integrating Bioenergy and Poultry Production Using Rice Agro-Waste (integrated Bioenergy Agriculture Model)	Prof. John David Kabasa
12	Developing Monitoring System For Quantifying and Mapping Antibacterials Used in Livestock Farming Systems in Uganda	Associate Prof. Lawrence Mugisha



13	Developing Novel Phytonutraceuticals from Wild Edible Fruits and Vegetables for Mitigating Malnutrition Among Pregnant Women and School Going Children	Dr. Anne Juliet Nalunkuma Kazibwe
14	Development of A Students' Practice and Community attachment Model for Enhancement of Youth Employable Skills in the Animal Resources Sector	Dr. Maria Nassuna-Musoke
15	Enhancing the Role of Farmers in the Fight Against Antimicrobial Resistance	Dr. Dickson Tayebwa
16	Establishment of A Platform to Strengthen Production of Safe and Healthy Dairy and Chicken Derived Foods Using One Health to Counter Antimicrobial Resistance and Drug Residues in Uganda. (Plas-Safe)	Dr. Paul Ssajjakambwe
17	Harnessing Microbial Probiotics for Improving Pig Health and Productivity	Associate Prof. Samuel Majalija
18	Optimization of the Dosage, Adjuvant and Route for the Candidate Anti-Tick Vaccine	Dr. Kokas Ikwap
19	Optimizing Smart Dairy Technologies for Efficient Sustainable Productivity of Dairy Farmers in Uganda	Associate Prof. Robert Tweyongyere
20	Peste Des Petits Ruminants (Ppr) in Uganda: Spatial Risk Analysis, Molecular Characterisation and Sero-Prevalence Drivers	Dr. Peninah Nsamba
21	Profiling the Role of Escherichia Coli in the Etiology of Piglet Diarrhea in Selected Pig Producing Districts of Central Uganda: towards Adoption or Development of Vaccines for Prevention	Prof. Joseph Erume
22	Strengthening the Capacity of Small Holder Fish Farmers and Fisheries Extension officers to Mitigate the Risk of Fish Diseases in Fish Farms in Uganda	Dr. Samuel Ponsian Wamala
23	Strengthening Veterinary Clinical Research, Training and Outreach at Makerere Through A Learner-Centered Herd-Health and Community Action Research Program (Sharp) for Improved Animal Welfare, Health and Productivity	Associate Prof. James Okwee-Acai
24	Unravelling the Burden and Transmission Dynamics of Antimicrobial Resistance Between Humans, Animal and Environment	Prof. Denis Karuhize Byarugaba
25	Using a One Health Approach to Develop Feasible Strategies for Surveillance of Antimicrobial Resistance and Stewardship of Antimicrobial Use.	Ms. Sarah Syedde Tegule
26	Using the One Health Approach to Design interventions to Reduce the Fish Disease Burden in Aquaculture Production Systems in Uganda	Dr. Irene Naigaga

27	Exploring Potential COVID-19 infection at the Human-Domestic animal interface in Uganda: a Case Study at Selected Hot Spots	Prof. John David Kabasa
28	Was the Novel Coronavirus Circulating in Uganda Before Being Detected in China? a Retrospective Study of Humans Sampled Before 2019 in Uganda To assess for Igg antibodies against SARS COV-2	Dr. Luke Nyakarahuka
29	Determination of Cross-Species Transmission of COVID-19 at animal-Human interface Using a One Health approach for Improved Disease Surveillance and Control	Dr. Jesca Nakavuma
30	Development of a Fluorescent Marker Sanitizer	Prof. Francis Ejobi
31	Risk assessment of Heavy Metals in Vegetables Consumed in Kampala Uganda	Dr. Andrew Tamale
32	Enhancing Capacity for Mobile and Rapid Field Laboratory Diagnosis of Bovine Trypanosomiasis	Dr. Rose Azuba
33	Enhancing the Efficiency of Emerging Entomic Meat and Protein Value Chains in Uganda	Dr. Claire Mack Mugasa
34	Epidemiological investigation of Brucellosis in Livestock in Selected Agro-Pastoralist Districts of Eastern Uganda	Associate Prof. Frank Norbert Mwiine
35	Genomic Epidemiology and Transmission Dynamics of Zoonotic Tuberculosis in Karamoja as a Predictor for the High TB Prevalence and Poor TB Treatment Outcomes in Karamoja Region.	R
36	Are Domestic animals Reservoirs for Emerging Viral infections: investigating the Role of Domestic animals in the Transmission Dynamics of Ebolaviruses, Marburg Viruses and Coronaviruses in Uganda.	Dr. Luke Nyakarahuka
37	Enhancing institutional Capacity for Ethical Conduct of Research involving animals (Icecoria)	Dr. Muhangi Denis
38	Accelerating Anti-Tick Vaccine Discovery Using Bioinformatics-Guided Wet Laboratory approaches	Dr. Muhanguzi Dennis
39	Assessing Ethical Conflicts and Moral Distress among Veterinarians in Uganda	Dr. Samuel George Okech
40	Development of Local Calibrations for Nutritional Evaluation of Commercial Poultry Diets Using Near Infrared Reflectance Spectroscopy (NIRS)	Associate Prof. Samuel Okello
41	Development and Validation of Lateral Flow Based Multiplex Test Device to Detect and Differentiate SARS COV-2 from Other Human Coronaviruses	Dr. Steven Odongo

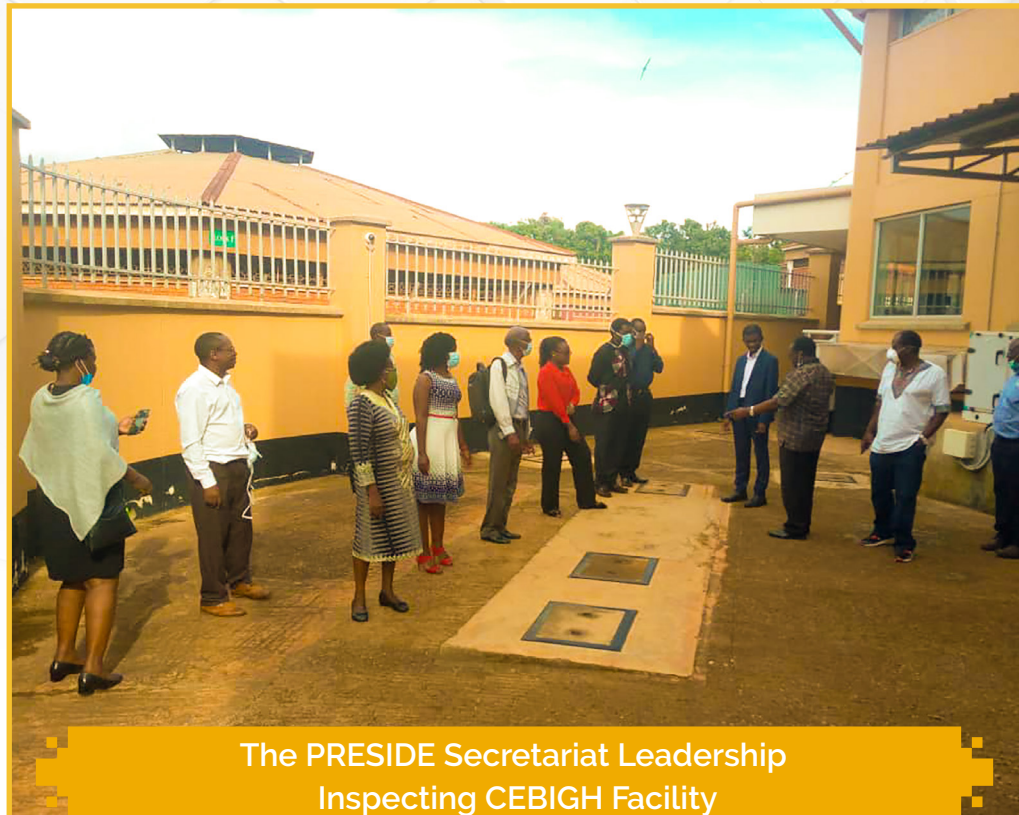


## 1.2.1. Presidential Scientific Initiative for Epidemics (PRESIDE) Strengthens the Center for Biosecurity and Global Health (CEBIGH) at COVAB

Uganda and the global community are facing a severe and unprecedented episode of COVID-19 pandemic, the worst of its kind in the history of humanity. The consequences of this shut-down are devastating. Initial estimates indicate mass erosion of Uganda's economy, with millions of Ugandans sliding into abject poverty.

Since 2012, the College of Veterinary Medicine, Animal Resources and Biosecurity has been establishing a Center for Regional Biosecurity and Global Health. The overall aim of initiative is to provide solutions for the preparedness, prevention, response as well as overall management of complex epidemic biotreats to Uganda and the region.

Thus, in 2020, the Presidential Scientific Initiative on



The PRESIDE Secretariat Leadership Inspecting CEBIGH Facility

Epidemics (PRESIDE) decided to strengthen the Center for Biosecurity and Global Health with additional research funds (over UGX 3 billion) to contribute to the development of COVID-19 biotech research and establishment of Central Laboratory Animal Research Facilities (CLARF).

### PROJECTS AWARDED:

a) Moulding novel subunit vaccine against novel COVID 19 virus using reverse vaccinology. *Lead Scientist: Dr. Kato Drago Charles, Department of Biotechnical and Diagnostic Sciences.*

b) Development of ELISA for SARS-CoV-2 detection using commercially available viral antigens.

*Lead: Scientist: Associate Prof. Enock Matovu, Department of Biomolecular Resources and Biolab Sciences.*

c) Upgrading Central Laboratory Animal Research Facilities for enhanced Vaccine, Drug and Biotech Quality Management. *Lead Scientists: Prof. John David Kabasa and Dr. Edward Wampade.*

# 2. Teaching and Learning





## 2.1

# Curricula and Programs Reviewed

To appropriate the market-oriented value-chain education and training, the college has expanded the range of training programs to cater for other occupational opportunities available in the animal world which hitherto were under-harnessed. As a result, the college has transformed from a mono-degree (veterinary medicine) institution of 150 students to a multi-professional and multidisciplinary degree college of over 2000 learners in the following programs:

	PROFESSIONAL TRAINING PROGRAM	DEGREE ENROLMENT (GRADUATE AND UNDERGRADUATE)	DIPLOMA AND CERTIFICATE*
1.	Veterinary Medicine	350	
2.	Biomedical Laboratory Technology	530	-
3.	Animal Production Technology & Management	120	40
4.	Wildlife Health and Management	60	-
5.	Industrial Livestock Farming and Business		
	a. Leather Technology & Industry		
	b. Insect Technology & Industry		
	c. Dairy Technology & Industry		
	d. Feed Technology & Industry		
	e. Meat Technology & Industry		
	f. Fish Technology and Industry		
	g. Avian Technology and Industry	100	150
6.	Livestock Development and Management	50	-
7.	Molecular Biology & Biotechnology	60	-
8.	Natural Products Technology & Value-chains Development	10	-
9.	Epidemiology, Preventive Medicine & Public Health	40	-
10.	Biosecurity and Infectious Disease Management	30	-
11.	Food Animal Health and Production	10	-
12.	Laboratory Sciences and Management	15	50
<b>TOTAL</b>		<b>1375</b>	<b>240</b>

\* Diplomas and Certificates are tenable at affiliated institutions (AFRISA and ISTVS)

## 2.2 Admissions 2019/2020

<b>PROGRAM</b>	<b>NUMBER OF ADMITTED STUDENTS</b>
Bachelors of Veterinary Medicine	76
Bachelors of Biomedical Laboratory Technology	224
Bachelors of Wildlife Health and Management	11
Bachelors of Industrial Livestock and Business	51
Bachelors of Animal Production Technology and Management	23
Diplomas and Certificates in Livestock Industry and Business	106
<b>Total</b>	<b>491</b>





# 3. Community Outreach, Knowledge & Technology Transfer





### 3.1 Program for Mass Skilling, Production, Enterprise Development and Accreditation (SPEDA) through AFRISA and Nakyesasa Incubation Center (Lead Scientist- Prof. John David Kabasa)

**SPEDA** is a joint Initiative of the Government of Uganda and Makerere University which is the result of the Presidential Initiative for Science and Technology (PIST). It is implemented through Academic-Community-Public Private-Partnerships (ACP3). Through this initiative a number of facilities and innovation are being developed.



#### 3.1.1 Leather Business Research, Innovation & Skilling Laboratory (BRISL) at Nakyesasa.



Front view of Leather BRISL



Interior view of the Leather BRISL



Working table and Scoring Section



Stitching section



Some of the finished leather products from the center



### 3.1.2 Feed Business Research, Incubation and Skilling Facility at Nakyesasa.



The Fish feed factory with a daily production capacity of 6 tonnes per day has been established for business, skilling, and research support. There is urgent need to get it running with a start-up capital of 100 million UGX. The factory has pending orders. Current funding from SPEDA project is inadequate to capitalise the factory.

### 3.1.3 Korea - Uganda Dairy Technology Training and Service Facility (KUDaP)

**K**orea Uganda Dairy Project (KUDaP) is a project being implemented by the School of Veterinary Medicine and Animal Resources (SVAR), College of Veterinary Medicine Animal Resources and Biosecurity (COVAB) Makerere University led by Robert Tweyongyere and Chonbuk National University (CNBU) lead by Lee Hank Kyo.

The project proposal was submitted to and is funded by Korea Rural Community Cooperation (KRC) under the MoU signed between the Ministry of Agriculture, Food and Rural Affairs (MAFRA) – Republic of Korea and the Ministry of Finance, Planning



The KUDaP Launch



and Economic Development (MFPED) - Republic of Uganda in December 2018. The main objective of the project is to increase dairy farmers' household income in Uganda by increased access to dairy farming knowledge, improved breeds of dairy cattle, dairy husbandry equipment, facilities and value addition.

The main components of KUDaP are

- Construction of Dairy Demonstration Farm facilities at Makerere University including farm structures and implements
- Provision of Dairy cows high quality semen and Embryos for farmers
- Feeds production i.e. Pastures and fodder Crops
- Upgrading breeding Laboratory capacity at NAGRC & DB
- Human capacity development in Uganda through training programs for farmers, AI technicians and veterinary and dairy production professionals

## KEY MILESTONES OF THE INITIATIVE

The project was launched with a ground-breaking ceremony for construction of a dairy demonstration farm on November 08th, 2019. Works achieved up to 31st December 2020

### 1. Construction of dairy demonstration farm facility

- cattle pen superstructure has been constructed pending completion of partitionings and finishes
- management office building has been constructed
- milking parlour superstructure erected
- milking parlour equipment procured and pending installation
- spray race constructed
- Perimeter fence and biosecurity gate installed
- Two feed silos constructed
- Two farm tractors and accessories

Advanced machinery at the demonstration facility



Hay baler

Hay rake

Silage Chopper



Biosecurity gate at the farm entrance

including one plough, disc hallow, seeding machine, silage chopper, hay collector and bailer, trailer, front roader, and a TMR mixer were procured.

### 2. Administrative and operational support

- Two project vehicles (Ford Ranger XLT double cabin pickups) procured
- assorted office furniture (chairs, tables, book file shelves, six computers).

### 3. Capacity building

- Conducted three training workshops for farmers/stakeholders,
- Participated in training of 30 AI technicians,
- Conducted a special refresher training workshop for A.I technicians,
- Secured additional funding from MaKRIF for research training in dairy improvement.



Refresher training workshop for Artificial inseminators held at NAGRC&DB on 02nd December 2020



## 3.2 Internationalisation of Makerere University Technical Support to the Horn of Africa

COVAB has been supporting the Inter-Governmental Authority on Development (IGAD) to establish a regional technical veterinary school in the Horn of Africa, in a bid to promote regional peace, trade and socio-economic development in the arid and semi arid lands (ASALs).

In 2020, the University reviewed and endorsed the continuation of technical assistance and support to the Horn of Africa and the Somali ecosystem. In this regard the affiliation of IGAD Sheikh Technical Veterinary School (ISTVS) was extended for five years. Students from the Horn of Africa will access

quality diploma training in livestock health sciences and production from Makerere University tenable at ISTVS. Affiliation of other programs will be explored. We are grateful for the enabling support and collaboration of the IGAD, Government of Uganda and development partners.

# ISTVS

IGAD Sheikh Technical Veterinary School (ISTVS) built and affiliated to Mak-COVAB



ISTVS, a well-established tertiary education institution located in Sheikh, Somaliland, was adopted by IGAD in July 2012 in line with its strategy to explore the viability of establishing a dedicated institution working for improved resilience in the pastoral areas of the ASALs region



### 3.3 AFROHUN Strengthens Engagement

#### Skills, Technology and Knowledge Transfer Accorded to COVAB with Support from AFROHUN Uganda.

COVAB is host to the Africa One Health University Network (AFROHUN) country office. The network is advancing One Health approaches across educational and health delivery establishments. In 2020, together with various Makerere University Colleges and other partners attained a number of achievements.

In year one of the One Health Work Force-Next Generation project, with funding from USAID through AFROHUN, the Uganda country chapter has supported Makerere University and Mbarara University of Science and Technology.

Specifically, at the College of Veterinary Medicine, Animal Resources and Bio security, knowledge transfer was done during an on-line training which ran for a month from June-July 2020 offered to ten faculty. The training steered by College of Education and External studies enabled faculty to acquire skills to deliver courses on-line, transform courses/course

content from a face to face approach to on-line.

Over thirty (30) students, 28 undergraduates and two graduate students from COVAB were supported to undertake activities in one health including; Participation in the Worlds' Rabies day (Led my MAAIF in partnership with FAO and AFROHUN), Completion of 5 weeks training in one health principles and practice and participation in

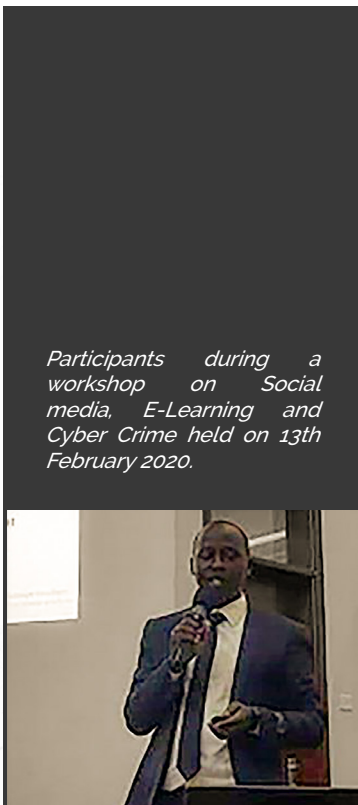


COVID-19 related activities. On COVID-19, students conducted observatory studies looking at the adherence to Standard Operating procedures and Use of face mask in Makerere University during the lock down period.





### 3.4. Embracing E-Learning and Mitigating Cyber Crime



Given the COVID 19 Pandemic which struck the entire globe, our education system of academic staff interfacing with students was much affected. We therefore adjusted to online teaching and learning as a university policy to control the spread of COVID 19. Fortunately, our students and staff have come to embrace this system following the online trainings held by our ICT team.

We thus appreciate the College of Education and External studies for spearheading the extension of online usage skills to all

our students and staff. We also appreciate Makerere University for providing the tools required for the online education. Our appreciations as well go to the college administration and our ICT team for their support towards introducing the E-Learning system to all our staff and students.

On 13th February 2020 social media enthusiasts around Makerere University held a workshop at the Makerere University College of Engineering, Design, Art and Technology (CEDAT) to brainstorm ideas on how social

media has become an enabler to Effective Communication, E- Learning & Cyber Crime.

The engagement sought to dissect the role of social media in higher Education systems and possible strategies to mitigate cyber crime around the university and beyond. With the challenges that were waved by COVID 19 all over the world,

*COVAB has continued to embrace E-Learning as a way to control the spread of the corona virus.*





### 3.5. Veterinary Students Conduct Mass Vaccination in Mubende District

COVAB students continue to contribute to good health promotion in the country. This was exhibited on 22nd February 2020 when the Makerere University Veterinary Students' Association organized a health community outreach in Mubende District. During this exercise, a number of kittens and dogs were diagnosed and vaccinated. Students also sensitized the residents on basic animal health and how best dogs can be lived with.



*Veterinary students carrying out dog and cat spaying exercises during the community outreach in Mubende district.*



# 4. Human Capital Development

*Strengthening the Shift*

*from a Veterinary Medicine Training Institution Only to a Multi-profession One Health College Involving Veterinarians, Biomedical Laboratory Technologists, Wild Life Technologists, Animal Production Technologists, Livestock Farm Industrialists, Aquatic Health Technologists, Animal Value Chain Technicians, Biomolecular Technologists, Biosecurity & Transboundary Infectious Disease Managers, Field Epidemiologists, Livestock Economists and Social Economists, Animal Sector Development Planners & Managers, Among Others*



## 4.1 Broadening Science Disciplines

In line with the value-chain education development paradigm, science discipline specialties at the college have expanded from the nine traditional disciplines of veterinary medicine to embrace at least 22 disciplines essential for comprehensive veterinary medicine, animal resources and biosecurity development. These are summarized below.

MULTIDISCIPLINARY DEPARTMENT	DISCIPLINE SPECIALTIES	FACULTY PER DISCIPLINE	TECHNICAL STAFF
Department of Vet Pharmacy, Clinical & Comparative Medicine (PCM)	Veterinary Surgery	4	1 (temporary)
	Theriogenology and Reproductive Technology	5	1 (retiring)
	Veterinary Medicine	8 (1 is Dean)	2 (temporary)
	Veterinary Pharmacy, Pharmacology & Toxicology	3	1 (temporary)
	Veterinary Pathology	5 (1 retiring)	1
Department of Livestock & Industrial Resources (LIR)	Livestock and Entomic Production Technology	5	1
	Animal Product Technology and Value Addition	3	
	Livestock Economics, Entrepreneurship and Policy	3	
Department of Wildlife & Aquatic Animal Resources Management (WARM)	Wildlife Health and Production	5	1
	Aquatic Health and Production	4	1
	Wildlife and Animal Resources Management	5	1
Department of Bio-technical & Diagnostic Sciences (BDS)	Biomedical Laboratory Technology	3	1 (study leave)
	Microbiology	5 (1 is Deputy Principal)	1
	Immunology & Vaccinology	1	-
	Parasitology & Entomic Vector Technology	3	1
Department of Biomolecular Resources & Biolab Sciences (BBS)	Physiology, Biochemistry & Nutrition	6	3
	Molecular Biology, Computational & Biosynthetic Technology	4 (1 is Dean)	
	Anatomical Sciences	4	
Department of Biosecurity, Ecosystems & Vet Public Health (BEP)	Veterinary Public Health & Food Safety	3	1
	Epidemiology and Preventive Medicine	3 (1 on study leave)	1
	Biosecurity and Ecosystem Health	3 (1 is principal)	1
	Research, Biometry & Decision Sciences	3 (1 on study leave)	



## 4.2 Staff Affairs

### 4.2.1 Promotions

1.	Dr. Baluka Sylvia Angubua	M	Promoted to Senior Lecturer	Department of Livestock and Industrial Resources
2.	Dr. Kizito Kahoza Mugimba	M	Lecturer	Attained a Phd

### 4.2.2 Appointments to Academic Leadership

1.	Associate Prof. Robert Tweyongyere	M	Dean - School of Veterinary Medicine and Animal Resources	
2.	Dr. Claire Mack Mugasa	F	Head – Department of Biotechnical and Diagnostic Sciences	
3.	Dr. Sarah Agnes Nalule	F	Head–Department of Wildlife and Aquatic Animal Resources	
4.	Dr. Immaculate Nakalembe	F	Head–Department of Biomolecular Resources and Biolab Sciences	

### 4.2.3 Staff Transfers

1.	Godwin Okiror	M	Human Resource Officer	Transferred to COVAB
2.	Ben Mugisha	M	Custodian	Transferred to CONAS
3.	Godfrey Makubuya	M	Former Human Resource Officer(COVAB)	Transferred to CONAS

### 4.2.4 Newly Appointed Staff

1.	Dr. Andrew Tamale	M	Department of Wildlife and Aquatic Animal Resources	Lecturer	Appointed w.e.f 4th January 2021
2.	Dr. Celsus Sente	M	Department of Wildlife and Aquatic Animal Resources	Lecturer	Appointed w.e.f 4th January 2021
3.	Dr. Patrick Mawadri	M	Department of Veterinary Pharmacy, Clinical and Comparative Medicine	Assistant Lecturer	Appointed w.e.f 4th January 2021
4.	Dr. Benedicto Byamukama	M	Department of Veterinary Pharmacy, Clinical and Comparative Medicine	Assistant Lecturer	Appointed w.e.f 4th January 2021

## 4.2.5 Staff Exit from University Service

S/N	NAME	DEPARTMENT	REASON	EFFECTIVE DATE
1	Associate. Prof. John Bosco Nizeyi	Veterinary Pharmacy, Clinical and Comparative Medicine (PCM)	Retirement	9th June 2020
3	Dr. Godfrey Bigirwa- Assistant Lecturer	Veterinary Pharmacy, Clinical and Comparative Medicine (PCM)	Deceased	15th September 2020
4	Ms. Rosette Tumushabe – Lab. Attendant	Veterinary Pharmacy, Clinical and Comparative Medicine (PCM)	Retirement	3rd August 2020
5	Mr. Mukasa Michael Kiberu-Senior Technician	Veterinary Pharmacy, Clinical and Comparative Medicine (PCM)	Retirement	7th August 2020
6	Ms. Joyce Margaret Ekopai- Technician	Wildlife and Aquatic Animal Resources (WAAR)	End of Contract	31st December 2020



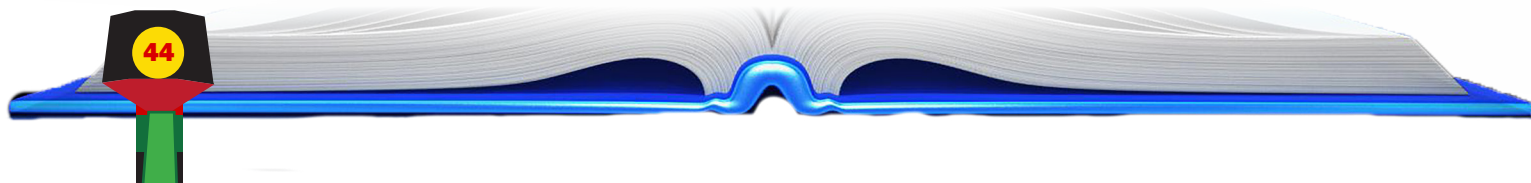


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