



Kenya Veterinary Capabilities Summary

Note: Throughout the Kenya country study, referenced open-source information describing standards, laws, regulations, programs and capabilities is presented to the reader. In some topic areas, information obtained by private research analysts in the course of their normal research projects through discussions with knowledgeable individuals in Kenya possessing good access to information has been included for consideration. This referenced interview material will appear in italics as well as being identified as referenced footnotes.

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Executive Summary

Overview

Kenya has a developing veterinary services infrastructure struggling to meet the challenges facing their country. A lack of funding, educated personnel, national infrastructure and strong and effective central government currently undermine the efficacy of all veterinary services infrastructure. The information of the following summary has been extracted from the full report to follow and is based on information gathered from firsthand accounts collected during in-country research studies and web based open source research.

Background

Basic Information

Kenya has a population of approximately 41 million people and occupies 224, 960 square miles. The territory covers a wide range of biomes from coastal plains along the Indian Ocean and up through higher elevation plateaus up to 9000 feet in elevation. Kenya also has the agriculturally productive Highlands in the south and the Great Rift Valley bisects the country.

Kenya's two principal cities, Nairobi and Mombassa have large populations; with Nairobi cresting three million people and Mombassa roughly nine hundred thousand. Kenya's gross domestic product (GDP) is estimated at \$31B with Kenya's annual per capita income estimated to be less than one thousand dollars per year. The economy is highly agrarian with approximately 80% of the population involved in agriculture; while the other large percentage of GDP is related to food processing comprising approximately 19% of GDP.

Environmental Information

Kenya covers 224,960 square miles, ranging across diverse biomes, covering regions that range from tropical to arid climates. Only 4,247 square miles of the total area Kenya encompasses are surface water and only 48% of the total landmass is used for agriculture with only 16% of the total area having potential for medium to high intensity agricultural exploitation. The bulk of the arid and semi-arid lands (receiving between 8 and 30 inches in rain fall annually) are exploited as rangelands or used for game parks; whereas tropical lands are largely used for medium to high intensity agriculture.

Livestock Industry Information

Livestock is crucial within the Kenyan economy serving as a significant employment opportunity for half of the national agricultural workforce. Beef dominates food production with sheep and goats ranking second, camel meat providing another important food source as do meats procured from donkeys. Poultry also serves a prominent role in the animal foods sector but due to costs pork, except for some exclusive markets, is largely too expensive for most Kenyans. Other minor livestock sources include horse meat, other poultry types, ostrich and rabbits.



Figure 1 – Map Location for the Country of Kenya

The following two graphics presented in Figures 2 and 3 below were supplied by the Kenyan Bureau of Statistics and the World Organisation for Animal Health (OIE) supplying statistics on Kenyan livestock by type/category. While both estimates are essentially in agreement it is noteworthy to point out that Kenyan livestock population numbers do vary according to source. While the exact cause of disagreement between these two organizations is unclear there are several possible speculations; namely:

- Culturally, many Kenyan communities do not disclose accurate livestock counts for fear of confiscation
- All livestock age groups may not have been taken into consideration
- All livestock types/categories may not have been considered
- Various economic livestock production aspects were overlooked with infrastructure and support systems needing to be taken into account

Kenya Bureau of Statistics - 2009 survey illustrating livestock production by type:

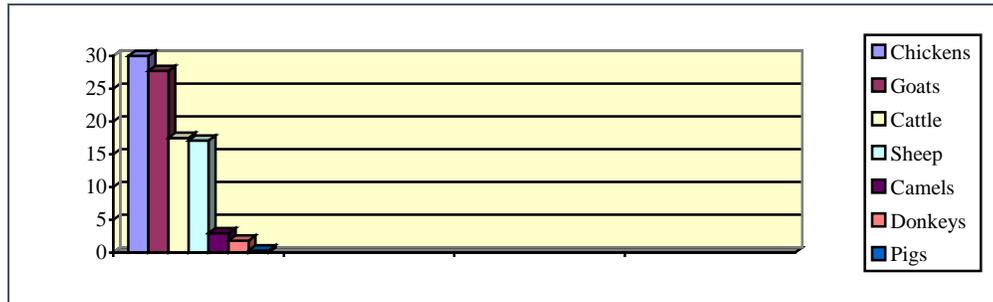


Figure 2 - Production numbers of major livestock species, in millions (2009 Statistics)

OIE - 2010 survey illustrating livestock production by type:

Species	Country Population
Birds	31,827,529
Camels, etc.	2,969,111
Cattle	17,467,774
Goats	27,740,153
Sheep	17,129,606
All Animals	142,338,621

Figure 3 - Selected Kenyan Domestic Animal Species (2010 Statistics, OIE)

Disease Information

Kenya faces a host of threats from endemic and emerging animal and/or zoonotic diseases of national, regional, and international interest; the following is a summary of relevant information compiled using our own research gathering and reporting supplied by OIE. This information has been developed based upon 2010 resources. Reporting range was compiled between the years of 2005 through 2010:

- Anthrax in animals - Occurs frequently
- Bovine Anaplasmosis - Occurs very infrequently
- Bovine Babesiosis - Present but without quantitative data
- Brucellosis (*Brucella Abortus*) - Periodic, low numbers of incidences over the years¹
- Contagious Bovine Pleuropneumonia - Sporadic low number incidences for some years
- Contagious Caprine Pleuropneumonia - Low number incidences throughout the years
- Foot-and-mouth Disease - Ongoing incidences throughout the years involving numerous serotypes²

¹ (3 June, 2011. Pper the Animal Diseases Act, the Minister for Livestock Development declared Brucellosis a notifiable disease in Kenya

² Mostly O, SAT 1, SAT 2, and a few occurrences of A

- Fowl Cholera – Suspected, but not confirmed
- Fowl Typhoid - Low number incidences throughout the years
- Heartwater - Suspected but not confirmed
- Infectious Bursal Disease - Low number of incidences for most years and confirmed infection/infestation without clinical signs for a few years
- Marek's Disease - Few incidents reported in 2005-2007 with one report in 2010
- Newcastle Disease - Incident reported in 2005, but greatest number of incidences reported in 2006 and 2010. Some incidences also reported in 2007 and 2008. Disease still present but without quantitative data or suspected cases in 2009 or 2011
- Peste Des Petits Ruminants - Most incidences reported in August 2006. Few incidences in 2007 with an outbreak in 2008. Only confirmed infection/infestation without clinical signs in other years
- Porcine Cysticercosis - Suspected but not confirmed
- Rabies - Large number of incidences reported each year
- Rift Valley Fever - Significant outbreak in 2007 with 36 incidents reported, no other reported incidents for this period
- Surra (*Trypanosoma Evansi*) - Single incident reported in August 2007. Suspected, but not confirmed instances in other years
- Theileriosis - Incidents reported in 2006, 2007, 2009 and 2010; with confirmed infection/infestation without clinical signs for other years
- Trypanosomiasis - Suspected but not confirmed

Additional Information on Livestock Diseases

The following tables detail transboundary animal diseases broken down by importance at the community, national and international levels. An additional chart within the bottom of this section also describes susceptibility to Avian Influenza. The immediate chart below details diseases of national and international importance:

Disease	Domestic/Wildlife Association	Status
Rinderpest	There is a wide host range for the disease in ruminants and suids. Wildlife species are poor maintenance hosts. Those most affected are buffalo, kudu, eland, and warthog. Acute disease is seen in cattle, wild ruminants, and pigs.	In 2011 Rinderpest was declared eradicated worldwide.
Peste Des Petits Ruminants	Wild/domestic small ruminants are the hosts. Disease cycles endemically in nomadic herds, and transhumance* introduces it to native populations.	Serological evidence was found in sheep and goats in Kenya, 2001 and a significant outbreak in 2008. Significance is due to the importance of sheep and goats for food security.
Rift Valley fever	Many species of <i>Culex</i> and <i>Aedes</i> mosquitoes can transmit the disease. No vertebrate reservoir host has been identified. The reservoir is drought-resistant eggs of <i>Aedes</i> .	The disease causing virus is endemic in East Africa and causes sporadic animal and human epidemics after long inter-epidemic periods.
Foot-and-mouth Disease	Wildlife species are not reservoirs for the disease except buffalo, which are persistent carriers of SAT1 and SAT2 serotypes. The disease is highly contagious and spreads rapidly. Cattle, pigs, sheep, goats, and wildlife (e.g., wildebeest in Serengeti) are affected. Types A, O, C, SAT1, and SAT2 have been isolated in Kenya.	The disease is widespread and endemic in cattle and wildlife. There is major epizootic potential. Livestock movement control and vaccination are priorities for control.
African Swine Fever	Domestic and wild pigs contract the disease. Maintenance hosts are argasid ticks (<i>Ornithodoros</i> spp); with a secondary role played by free-ranging porcine hosts (warthogs are asymptomatic carriers of the virus).	This disease has major epizootic potential. It was first reported in 1921, and reappeared after 30 years and involved movement of pigs.
Contagious Bovine Pleuropneumonia	The disease is closely associated with livestock movement and is not dependent on a wildlife reservoir. Sources of new outbreaks are chronic livestock carriers.	The disease is endemic in northeastern Kenya, but is periodically seen in central Kenya. The rest of the country is at risk for infection via uncontrolled animal movements. Livestock vaccination is critical to control spread of the disease.

Figure 4 - Transboundary Diseases of National and International Importance

Chart below details diseases of importance at the national and community levels:

Disease	Wildlife/Livestock Interaction	Status
Malignant catarrhal fever	All wildebeest species are reservoirs for the disease. Cattle are infected when exposed to the virus from nasal secretions of wildebeest calves. The disease is fatal in cattle and limited to areas where cattle and wildebeest interact (e.g., Maasailand). Cattle are dead-end hosts.	The risk period for contracting this disease is greatest over four months in the wildebeest calving period. Morbidity is low, but the case-fatality rate high, with up to ten percent losses of the herd.
African horse sickness	The disease is endemic in zebra, which is the wild maintenance host, and it cycles throughout year. The prevalence rate of antibodies in elephants is high, but role of elephants as maintenance host seems unlikely. This is an important disease in horses.	This disease has moderate epizootic potential. Midges of the <i>Culicoides</i> species transmit it.
Rabies	Sylvatic rabies has been diagnosed in 33 carnivorous and 23 herbivorous species in sub-Saharan Africa, including jackals, honey badger, mongoose, bat-eared fox, and the civet cat in Kenya. This disease is transmitted from wildlife to livestock and vice versa, but domestic dogs thought to be principal host.	Incidence of this disease has increased over the past 30 years. Most cases are reported in domestic dogs and cattle. Better control/vaccination protocols are required. This disease has significant zoonotic potential.
Theileriosis or corridor disease	The African buffalo is reservoir for <i>Theileria</i> parasites, which can cause disease in livestock. Cattle are dead-end hosts and unable to infect intermediate host's vectors.	This disease has moderate epizootic potential. Only <i>Theileria parva</i> (corridor disease) derived from buffalo is known to have a serious economic impact on livestock production. Cattle can be protected by immunization.
Trypanosomiasis	The protozoan trypanosomes that caused this disease are carried by the tsetse fly. Wildlife including elephant, rhino, buffalo, warthog, hippo, and various artiodactyls are maintenance hosts for this disease and are trypano-tolerant, but can show high infection rates with various trypanosome species. Domestic livestock, horses, and dogs are affected.	This disease has moderate epizootic potential. It is an important disease of cattle and horses. It severely hampers the livestock industry in tsetse fly endemic belts.
Brucellosis	There is a low prevalence of antibodies against this disease in wild bovids in Kenya. It is not thought to be a major problem in wildlife (although subtle impacts on fertility may be easy to miss). This is a difficult disease to eliminate from pastoral livestock.	The prevalence and incidence of this disease is not well documented. The disease carries a limited epizootic potential, but has zoonotic potential. Vaccination of livestock is possible.
Anthrax	Outbreaks of this disease have been documented in domestic species in absence of wildlife. Anthrax in wildlife is reported as both sporadic cases and major epidemics. Links between disease in wildlife and domestic species is unclear.	Anthrax has moderate epizootic potential.

Figure 5 - Transboundary Diseases of National and Community-Level Importance

Based upon bird migration, the figure below details areas that exhibit a high degree of risk for Avian Influenza outbreaks:

Region on Migratory Birds Flyways	Population Concentration		Hygiene Standards	Risk Levels	Special Remarks
	Human	Poultry			
1. North West	Low	Low	Neutral	Low	Region is very arid and populations are sparsely distributed
2. Western	High	High	Low	High	Culture promotes close contact with chickens
3. Central Rift	High	Medium	High	High	High potential for interaction between migratory & resident wild/domestic birds
4. Nairobi & Central Highlands	High	High	Mixed	High	Dense population with low hygiene in slums & high concentration of commercial poultry farms and open air bird markets
5. Tsavo	Low	Low	Low	Low	High potential for interaction between migratory & resident wild birds
6. Amboseli	Low	Low	Low	Low	Potential for introduction of HPAI from Tanzania
7. Coast	High	Low	High	High	High humidity favors transmission of respiratory infections in humans and animals & open bird markets

Figure 6 - Avian Influenza High Risk Areas

Government Infrastructure

This section is broken down into 8 parts developing an overview for key Kenyan government organizations and as information is available, for providing overviews of these ministry core functions. Each sub-section covers core functions, capabilities, structure, training and services.

Kenyan Ministries summarized within:

- Ministry of Agriculture
- National Livestock Market Information System
- The Ministry of Livestock Development
- Department of Veterinary Services
- The Department of Livestock Production
- Kenya Veterinary Board
- Kenya Dairy Board

Ministry of Agriculture

The Ministry of Agriculture (MOA) is a separate entity from the Ministry of Livestock Development and is tasked with promoting and facilitating the production of food and raw agricultural materials for the purposes of food security and economic development. MOA seeks to fulfill its mission by promoting a competitive agricultural environment for their farmers and producers through support services and by fostering environmentally sustainable natural resource management. An organizational chart of MOA is presented below in Figure 7:

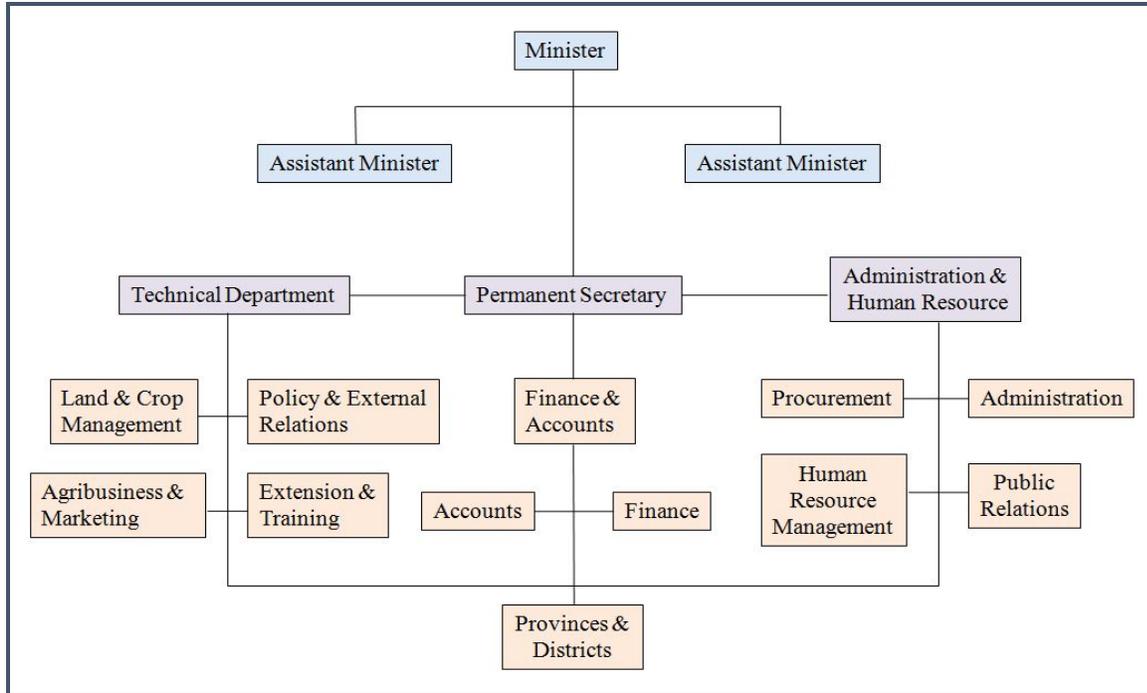


Figure 7 - Ministry of Agriculture (MOA) Organizational chart

Core Functions of the Ministry:

- Formulation, implementation and monitoring of agricultural legislation, regulations and policies
- Provision of agricultural extension services
- Supporting agricultural research and promoting delivery
- Facilitating and representing agricultural state corporations within Government
- Development, implementation and coordination of programs within the agricultural sector
- Regulation and quality control of produce and products from the agricultural sector
- Management and control of pests and crop diseases
- Promoting management and conservation of the natural agriculture resource base
- Collecting, maintaining and managing information from the agricultural sector

National Livestock Market Information System, Kenya

The National Livestock Market Information System, Kenya (NLMIS) evolved out of efforts for creating the Livestock Information Network and Knowledge System (LINKS). The LINKS system maintains information on livestock pricing. The culmination of these efforts is disseminated to livestock keepers, traders and policy makers.

The Ministry of Livestock Development

The Ministry of Livestock Development (MLD) was formed in 2008 from the mandate for promoting, regulating and facilitating livestock production. The MLD consists of two technical departments and three parastatal organizations. Those parastatals being:

- Kenya Dairy Board (KDB)
- Kenya Meat Council (KMC)
- Kenya Veterinary Vaccine Production Institute (KEVEVAPI)

The MLD strategic plan covering 2008-2012, launched in 2010, highlights five objectives: develop an appropriated policy and regulation environment; increase livestock productivity through increasingly accessible services and inputs

for farmers and pastoralists; enhance investment within the livestock sector; increase market access and enhancing institutional efficiency and efficacy in service delivery. There are four major challenges identified by the ministry in achieving its strategic goals: underfunding, understaffing, transport, and office accommodations.

Core Functions of the Ministry:

- Formulation, implementation and monitoring of policy
- Development and coordination of programs
- Regulatory management and quality control of inputs, produce and products
- Management and control of diseases and pests
- Provision and facilitation of extension services
- Research agenda settings, liaison and coordination
- Promotion and development of emerging livestock such as crocodiles and ostriches
- Management of information and agenda for monitoring and management of food security
- Management and conservation of the natural resource base

Training Institutions Under the Ministry

Three institutions train pre-service students and offer two-year certificate courses. The fourth trains in-service students

- Dairy Training Institute - Naivasha
- Ahiti Kabete
- Meat Training Institute - Athi River
- Ahiti Ndomba Animal Health And Industry Training Institute
- Ahiti Nyahururu Institute

Department of Veterinary Services

The Department of Veterinary Services (DVS) is positioned under the authority of the MLD and incorporates a relatively elaborate organizational structure including over 300 veterinary surgeons and over 1,000 support staff spread across the national territory. DVS manages delivery of veterinary services, collaborating with other ministries, local/international NGOs and other governments and development partners to achieve its objectives.

Veterinary related services provided by the DVS include:

- Disease control
- Laboratory work
- Epidemiological,
- Surveillance and economic research and investigations
- Public health services

Undermining the DVS's efforts are the realities of underfunding, understaffing, insufficient transportation, inadequate infrastructure and a lack of adequately educated personnel.

Additional Services of the Department Include:

- Veterinary Training and Clinics
- Artificial Insemination Services
- Veterinary Extension services
- Veterinary Project Management Support Unit
- Veterinary Administration and Management Support Services

Department of Veterinary Services organizational chart is presented below:

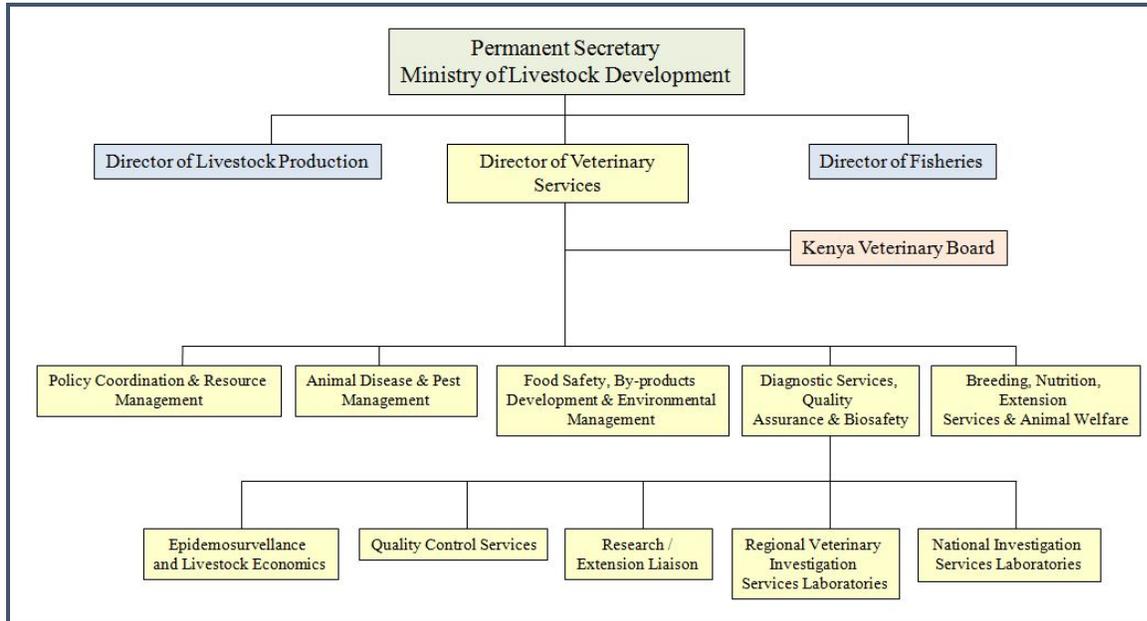


Figure 8 - Department of Veterinary Services Org chart

The Department of Livestock Production

The Department of Livestock Production (DLP) is also under the MLD and is structured for promoting sustainable livestock production, marketing and for adding value to the livestock sector by fostering appropriate legal and policy frameworks for encouraging product quality standards. DLP focuses on information and technology dissemination as well as implementation supporting the larger MLD mission.

Core Functions of the Department:

- Formulation, implementation and monitoring of livestock production policies
- Coordination of livestock production programs
- Facilitation of livestock marketing and value addition of livestock products/by-products
- Facilitate regulatory management and quality control of livestock inputs, produce and products
- Provision and facilitation of livestock extension services
- Setting livestock research agenda, liaison and coordination
- Enhance and promote production of emerging livestock
- Promote management of livestock information and the agenda for monitoring and management of food security
- Promote conservation and management over the natural resource base
- Mainstreaming gender and HIV/AIDS concerns into livestock production programmers

Department Divisions

- Animal production
- Range management
- Livestock marketing
- Extension services
- Apiculture and emerging livestock
- Monitoring and evaluation
- Training

Kenya Veterinary Board

The Kenya Veterinary Board (KVB) was established in 2010 under the *Veterinary Surgeons Act* with the purpose of regulating the veterinary profession as well as facilitating vertical/horizontal public/private partnerships covering veterinary and livestock related issues.

As a regulatory body for the veterinary profession the eight member board is constituted in the following manner:

- Four members elected by registered veterinary surgeons and appointed by the minister in charge of DVS
- Minister nominates two members and two additional members are *ex-officio* members i.e. Director of Veterinary Services and the Dean of the Faculty of Veterinary Medicine, University of Nairobi
- Minister also nominates the board chairman

Board Core Functions:

- Register all veterinary surgeons and for maintaining a registry of retained veterinary surgeons
- License and regulate private veterinary practice
- Establish and strengthen veterinary specialist colleges
- Formulation and enforcement of a code of ethics across the veterinary profession
- Regulate veterinary education while promoting continuous professional development
- Inspect and accredit animal health training institutions, veterinary laboratories and clinics
- Maintain registry of animal health institutions and animal health service providers
- Monitor animal research and ensure maintenance of minimum animal welfare standards
- Provide technical advice to the MLD on prevailing and pertinent issues
- Promote national, regional and international cooperation on veterinary and livestock matters

The board also regulates the University of Nairobi and provides supervisory services over other academic institutions listed below:

- Animal Health and Industry Training Institute (AHITI)
- Meat Training institute
- Kenya Wildlife Service Training Institute
- Dairy Training Institute - Naivasha

Kenya Dairy Board

The Kenya Dairy Board (KDB) was established to facilitate development of a sustainable and competitive dairy industry that produces safe, quality products and for contributing to national economic development. Defined in the Dairy Act, the functions of the KDB are to:

- Organize, regulate and develop the efficient production, marketing, distribution and supply of dairy produce
- Improve dairy produce quality
- Secure reasonable and stable prices to producers of dairy products
- Promote market research in relation to dairy products
- Permit the highest degree of private enterprise involvement within the production, processing and sale of dairy produce
- Adopt measures and practices that promote efficiencies within the dairy industry

Additional Responsibilities Include:

- Promoting quality assurance for attaining high quality products with an emphasis on milk production hygiene
- Encouraging proper use of milk containers during milk transportation and storage
- Regulating the sales of raw milk and importation of dairy produce
- Promoting the consumption of quality milk and milk products
- Developing, promoting and providing advice on proper packaging equipment and materials
- Licensing milk producers and processors

- Enforcement of the Dairy Industry Act through anti-hawking operations and prosecutions. This also includes short courses and seminar training for farmers to produce milk within sanitary conditions and using modern techniques.

Non-Governmental Infrastructure

Kenya Veterinary Association

The Kenya Veterinary Association (KVA) is the legally chartered and registered professional association for all veterinary and para-veterinary workers in Kenya. The mandate of the KVA is to act as custodian of the profession, ensuring proper management of veterinary issues affecting the welfare of veterinarians with a view toward improving animal welfare. Supporting these measures, KVA maintains in-depth checks and balances structure across the country for sponsoring publications, events and continuing education programs. They also provide member benefits and coordination for the government enacted Strategic Plan.

Institutions and Laboratories

Kenya Agricultural Research Institute

The Kenya Agricultural Research Institute (KARI) incorporates a number of research facilities which focus on a variety of research programs including food crops, horticultural and industrial crops, livestock and range management, land and water management and socio-economics.

Kenya Agricultural Research Institute locations and laboratory information is presented below:

KARI Institutions and Laboratories by Title and Location			
KARI Headquarters PO Box 57811-00200	KARI – Muguga South PO Box 30148-00100 Nairobi, Kenya	KARI – Mugunga North PO Box 32-00903 Kikuya, Kenya	KARI – Embu PO Box 27-60100 Embu, Kenya
KARI – Kitale PO Box 450-30200 Kitale, Kenya	KARI – Kabete PO Box 14733-00800 Nairobi, Kenya	KARI – Naivasha PO Box 25-20117 Naivasha, Kenya	KARI – Mtwapa PO Box 16-80109 Mtwapa, Kenya
KARI – Kibos PO Box 1490-40100 Kisumu, Kenya	KARI – Thika PO Box 220-010000 Thika, Kenya	KARI – Marsabit PO Box 147 Marsabit, Kenya	KARI – Perkerra PO Box 32-30403 Marigat, Kenya
KARI – Molo PO Box 100-20106 Molo, Kenya	KARI – Mwea Tebere PO Box 298-10300 Kerugoya, Kenya	KARI – Kiboko PO Box 12-90138 Makindu, Kenya	KARI – Lanet PO Box 3840-20100 Nakuru, Kenya
KARI – Njoro Private Bag-20107 Njoro, Kenya	KARI – Katumani PO Box 340-90100 Machkos, Kenya	KARI – Kakamega PO Box 169-50100 Kakamega, Kenya	KARI-TRC, Muguga PO Box 362-00902 Kikuyu, Kenya
KaRI – Tigoni Research Center PO Box 338-00217 Limuru, Kenya		KARI – Kisi PO Box 523-40200 Kissi, Kenya	KARI Biotechnology Centre PO Box 14733-00800 Nairobi, Kenya

Figure 9 - KARI Research Centers

Additional Institutions and Laboratories:

The International Livestock Research Institute (ILRI) - Kenya Headquarters
The Hub for Biosciences eastern and central Africa (BecA)

Kenya National Veterinary Laboratory Network:

Regional reference laboratories under the Kenya National Veterinary Laboratory Network are listed below:

- Mariakani - Serves Coast Province (*Two satellite laboratories at Ukunda and Witu*)
- Eldoret - Serves Northern Rift Valley (*Satellite laboratory at Lodwar*)
- Karatina - Serves Central and Eastern Provinces (*Satellite also in Isiolo*)
- Nakuru - Serves Southern Rift Valley
- Kericho - Serves Nyanza and the Western Rift Valley
- Garissa - Serves North Eastern Province

Presented below is an organizational chart for the National Veterinary Laboratory Network (KNVLN):

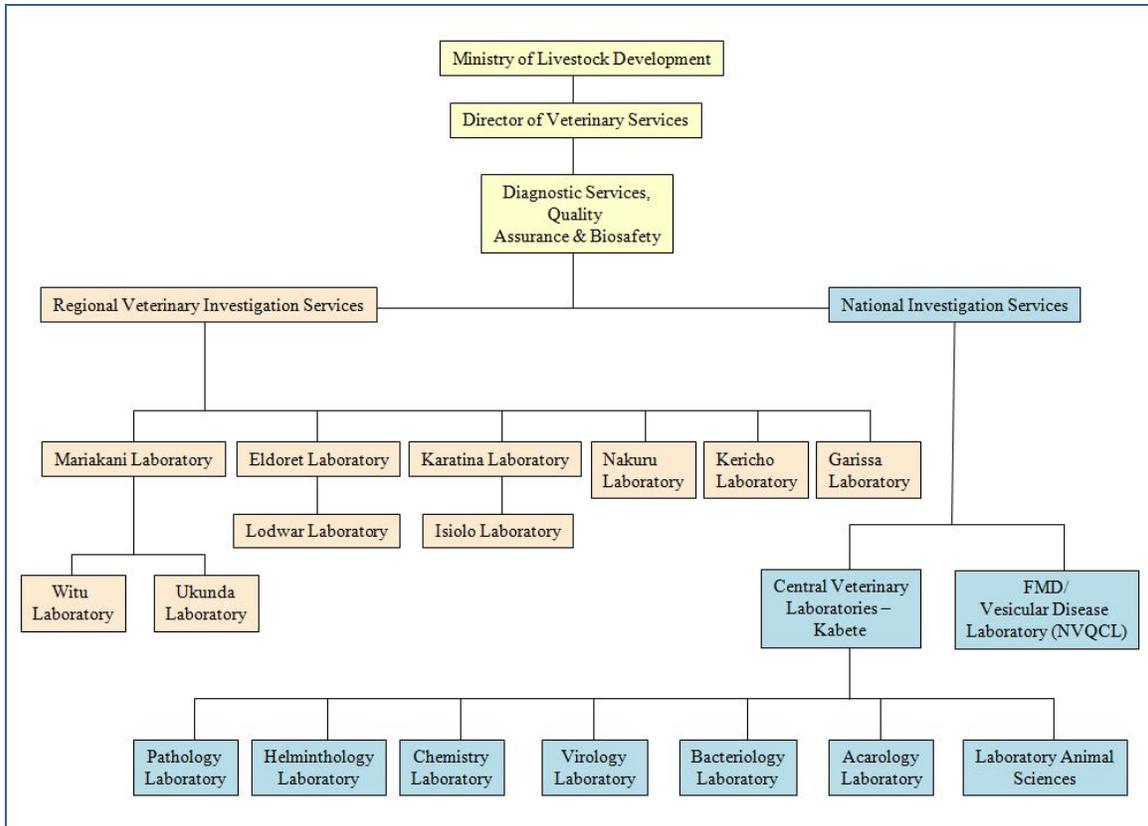


Figure 10 - National Veterinary Laboratory Network (KNVLN) Org chart

The Central Veterinary Laboratories, Kabete

We do not possess in-depth information concerning the Central Veterinary Laboratories (CVL) Kabete, but we do know that it does contain the:

- Foot-and-Mouth Disease/Vesicular Diseases Laboratory
- Kenya Veterinary Vaccines Production Institute

Biosecurity Capabilities and Procedures

There are biosecurity laws in Kenya that fall under the National Environment Management Authority, established under the Environmental Management and Coordination Act in 1999. Further biosafety responsibilities fall under the mandate of the Department of Veterinary Services. Other than the Department of Veterinary Services and the National Environment Management Authority, other key biosafety regulatory organizations include the Kenya Plant Health Inspectorate Service; the Pest Control Products Board; the Public Health Department and the Kenya Bureau of Standards.

Biosafety Issues Under the Department of Veterinary Services Mandate Include:

- Regulating the import/export and safety of animal health and production inputs such as feed, drugs and vaccines to include genetically modified organisms
- Certifying and regulating import/export of foods of animal origin
- Regulating the control of other biological materials
- Regulating genetically modified products and providing regulatory activities Kenya does not currently use or participate in. This includes scientific studies that employ animal genetic modification or cloning³
- Interacting with other agencies with similar responsibilities: The Kenya Ministry of Health is mandated to ensure safety of all foods while the Department of Veterinary Services handles food of animal origin; and collaboration with the Ministry of Agriculture in handling animal feed of plant origin and with the Kenya Bureau of Standards on issues of standards
- Providing food safety assessments for foods of animal origin per local and international regulations and protocols
- Monitoring and inspecting contained and confined field trials for research in animals, animal health and production inputs
- Release and post environmental release monitoring and ensuring the safety of genetically modified organisms

Kenya faces major biosecurity issues across all sectors of the poultry and livestock industries. Examples of which are cited below:

- Carrier vehicle drivers do not follow biosecurity procedures when moving between hatcheries, farms and on to other poultry enterprises
- Poor staff hygiene and lack of clean clothing and personnel protective equipment (PPE) are an issue. Over eighty percent of the small-scale farmers do not practice good staff hygiene
- Lack of integration between suppliers, feed mills and abattoirs is a problem. There are no integration activities between small-scale commercial farms or to the backyard system
- In the backyard system, different age groups and different poultry species (geese, chicken, ducks and turkeys) are reared together. This is not a problem in commercial systems
- Vaccination teams that cover more than one farm do not necessarily disinfect thoroughly between premises. This is a nationwide problem.
- Vehicles, containers and catching teams used for transport to production units are not routinely cleaned nor sanitized before/after visits
- Data on hygiene and sanitary standards is lacking in most hatcheries

Acts and Laws Regarding Food Safety and Livestock

The Acts of Parliament directly or indirectly associated with the governing of veterinary matters include:

- Veterinary Surgeons and Veterinary Para-Professionals Act - *ACT NO. 29 of 2011*
- Animal Technicians Act - *ACT NO. 11 of 2010*
- Agricultural Development Corporation Act - *Chapter 444*
- Meat Control Act - *Chapter 356*
- Dairy Industry Act - *Chapter 336*

³ Reportedly, the Ministry of Livestock has not proposed legislation or regulations dealing with genetically modified organisms and has not broached the topic with regulators of other governments

- The Agriculture Act - *Chapter 318*
- Animal Diseases Act - *Chapter 364*
- Biosafety Act - *ACT NO. 2 of 2009*
- Cattle Cleansing Act - *Chapter 358*
- Public Health Act - *Chapter 242*
- Radiation Protection Act - *Chapter 243 (In the case of irradiated Foods)*
- Food, Drugs and Chemical Substances Act - *Chapter 254*
- Customs & Excise Act - *Chapter 472*
- The Standards Act - *Chapter 496*
- Pest Control and Products Act - *Chapter 346*

Vaccines Produced

Kenya invests in vaccine production and maintains plans, strategies and institutions (*KEVEVAPI*) for research, development and production.

Products of KEVEVAPI include:

- Live attenuated Newcastle disease virus vaccine - *AVIVAX-F™*
- Live attenuated bluetongue disease vaccine - *BLUVAX™*
- Live attenuated CBPP vaccine - *CONTAVAX™*
- Inactivated fowl typhoid (*Salmonella gallinarum*) vaccine - *FOWLVAX™*
- Live attenuated contagious pustular dermatitis virus vaccine - *ORFVAX™*
- Live attenuated Rift Valley fever virus vaccine - *RIFTVAX™*
- Live attenuated Rinderpest virus vaccine - *RINDERVAX™*
- Live attenuated Newcastle disease virus vaccine - *AVIVAX-L™*
- Inactivated contagious caprine pleuropneumonia vaccine - *CAPRIVAX™*
- Inactivated FMD vaccine - *FOTIVAX™*
- Live attenuated lumpy skin disease virus vaccine - *LUMPIVAX™*
- Live attenuated fowl pox virus vaccine - *POXVAX™*
- Live attenuated sheep and goat pox virus vaccine - *S&G VAX™*
- Live attenuated turkey pox virus vaccine - *TURKEYVAX™*

Note: Since the major Rift Valley fever outbreak in 2007, the Kenyan government has noted that it has been manufacturing livestock (only) vaccines for Rift Valley fever at *KEVEVAPI*. The goal is the vaccination of two-million livestock across the nation.

KEVEVAPI Production Information compiled below:

Disease	Vaccine Type	Qty Doses Produced	Qty Doses Exported
Contagious Bovine Pleuropneumonia	Live Attenuated Vaccine	7,368,300	2,860,000
Foot-and-mouth Disease	Inactivated Vaccine	3,900,000	580,000
Fowl Cholera	Inactivated Vaccine	5,349,800	1,650,000
Newcastle Disease	Live Attenuated Vaccine	5,152,750	0
Peste Des Petits Ruminants	Live Attenuated Vaccine	765,000	0
Rift Valley Fever	Live Attenuated Vaccine	4,419,400	615,000
Sheep Pox and Goat Pox	Live Attenuated Vaccine	2,262,005	360,000
TOTALS:		29,217,255	6,065,000

Figure 11 - Animal Vaccines produced (2010 Statistics)

Vaccine Acquisition, Stockpiling and Use Plans

Kenya has standard minimal provisions for vaccine production, stockpiling, distribution and use.

Epidemiological Surveillance

The DVS's surveillance network covers large parts of the country and periodically generates reports on routine activity and outbreaks. DVS also makes use of geographic information systems (also known as *GIS*) for tabulating data and maintaining records in conjunction with other national and international organizations.

Surveillance Activities with Illustrative Diseases

Documented examples of surveillance systems currently indicate that Kenya is ill equipped.

Vector Control

Kenya maintains a vector control program in conjunction with regional and international organizations, but the primary focus is on tsetse and tick control.

Risk Analysis

Kenyan specialists use up to date information, albeit somewhat outdated methodologies, to achieve some success in risk analysis of high consequence disease events or outbreaks.

Models and Systems

Knowledgeable individuals confirm Kenya does possess methods for developing modeling systems predicting the economic impact of outbreaks.

Port Control

Government authority's efforts reflect only a moderate overall commitment to port and border security. Port and border inspection procedures are also only moderately effective and consistent for live animals, animal products and relatable goods.

Quarantine Standards

Kenya's quarantine standards during a high consequence/notifiable animal and/or zoonotic disease event and/or outbreak are consistent with OIE specifications.

Traceability Systems

Kenya has a livestock identification and food distribution traceability system (LITS) in place but it is neither well established nor particularly effective.

Government Communication and Coordination

During an event and/or outbreak capabilities, communication and coordination between intra-national parties is limited.

International and Regional External Coordination

Kenya regularly works with regional and international organizations such as the OIE, Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) and Vaccines for the Control of Neglected Animal Diseases in Africa (VACNADA).

Preparedness Examples

Kenya's response to recent avian influenza events, the 2006-2007 rift Valley Fever outbreak and response to peste des petits ruminants are all indicative of poor levels of national preparedness.

Education and Training Issues

Kenya only maintains one internationally recognized veterinary educational institution, the University of Nairobi. Simultaneously there are also shortages of veterinary specialists, crop and animal husbandry scientists.

Cleaning and Disinfection Following Outbreak or Event

Cleaning and disinfection plans to include costing procedures, administrative accountability and recordkeeping are entirely inadequate.

Livestock Slaughter Practices

Provisions do exist for standard minimal slaughter safety practices involving the inspection, permission, testing and animal disposal; if and when necessary.

Depopulation and Disposal Plans

Carcass disposal provisions are outlined within the Animal Diseases Act. Corpses infected with notifiable diseases are to be disposed of according to instructions of a veterinary officer or inspector. Persons disregarding these instructions are guilty of an offense. In turn the minister is allowed to improve provisions of the Act through defining new regulations and guidelines.

Loss Valuation

Official and publicized mechanisms for compensation of lost/destroyed animals after diagnosis and/or exposure to a notifiable disease are reported to be in place. However, these loss valuation mechanisms are unreliable.

Wildlife Surveillance and Disease Containment

The Kenyan Wildlife Services Veterinary Unit is tasked with wildlife surveillance duties and their current capabilities are limited due to underfunding.

Personnel Protective Equipment

There are insufficient guidelines for Personnel Protective Equipment (PPE). Additionally, equipment and materials are in short supply.

Physical Security at Research Facilities

Research and development facilities are adequately secured with physical security and make use of guarded/controlled entrances. Facilities have security measures in place that include personnel identification badges and background checks. Visitor controls are required and safety standards are generally universally accepted. Biosecurity incident plans are also in place.