



BOTSWANA

Veterinary laboratory



The contribution of livestock, especially the cattle industry's beef exports to the countries of the European Union, is an important socio-economic activity in Botswana. However, the livestock sector faces major threats from the transboundary animal diseases (TADs) that enter Botswana from neighbouring countries. Until recently, the Botswana National Veterinary Laboratory (BNVL) dealt with TADs by using conventional disease diagnostic methods. In order to speed up diagnosis and establish methods for early warning, prevention and control of TADs and other infectious diseases, the Joint FAO/IAEA Division assisted BNVL in developing and adopting modern molecular techniques such as polymerase chain reaction (PCR) and isotopic methods. This enabled BNVL to implement a quality management system according to ISO Standard 17025, which led to accreditation of 22 tests.

Botswana National Veterinary Laboratory

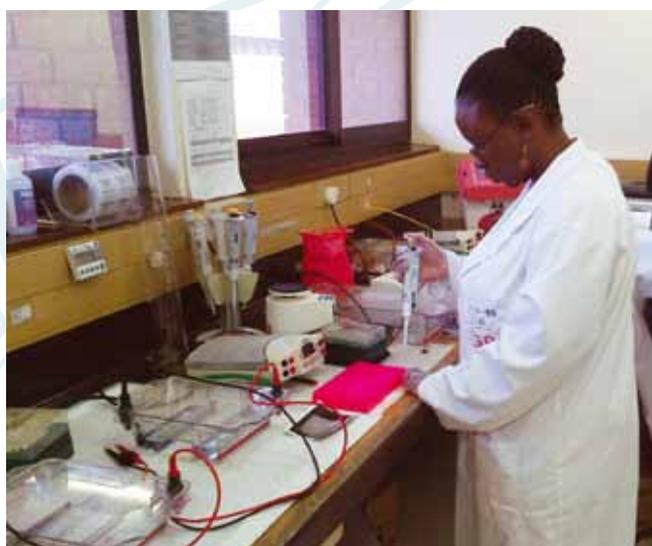
Improves cattle exports

The agricultural sector of Botswana, especially its cattle industry and beef exports to the countries of the European Union, remains a fundamental source of national subsistence and income. It occupies a place of importance alongside the diamond export industry which has been the principal driver of the high growth rate that lifted the country's annual per capita GDP to US \$16 400 in 2013. The major livestock species in the country include 2.5 million beef cattle, 600 000 dairy cattle, one million goats and 500 000 sheep.

Yet the sector continuously faces the threat of transboundary animal diseases such as foot-and-mouth disease (FMD) and contagious bovine pleuro-pneumonia (CBPP), which are present in neighboring countries. If they come across the border into Botswana, they can have a significant economic impact on trade, demand and supply. At the same time, other infectious diseases such as tuberculosis, rabies and brucellosis pose significant threats to public health.

Increasing laboratory diagnostic capacity

Until recently, BNVL relied mostly on conventional disease diagnosis methods. These methods are not sensitive or fast enough to provide timely and reliable results, which delays disease detection and response to disease outbreaks.



The Joint FAO/IAEA Division supported the BNVL in strengthening its diagnostic capacity by training BNVL laboratory personnel and introducing modern techniques such as nucleic acid amplification tests (also known as PCR tests) and isotopic methods, which can detect a virus or bacteria in a very early stage of the disease. These tests not only help countries to adopt effective prevention and control measures, but they also help to establish early warning systems.

Providing control for many animal diseases

CBPP is a cattle lung disease, endemic in several countries in southern Africa, including Angola, Democratic Republic of Congo, Namibia and Zambia. After 56 years of freedom from that disease, Botswana had an outbreak in 1995 which led to the loss of 300 000 cattle at a cost of US \$96 million before it was successfully eradicated in 1997. In order to maintain Botswana's freedom from CBPP, the Joint FAO/IAEA Division worked with BNVL to improve its molecular diagnostic capacity by providing training of laboratory personnel and by supplying equipment and reagents to strengthen its surveillance capacities. As a result of the improved capacity attained through the help of the Joint FAO/IAEA Division and collaboration with national and international laboratories, BNVL was granted the status of a World Organisation for Animal Health (OIE) reference laboratory for CBPP in May 2012.

Rift Valley fever (RVF) is a zoonotic disease of domestic ruminants caused by a mosquito-borne virus. Most severe in sheep, cattle and goats, the disease causes high mortality rates in newborn animals and abortion in pregnant animals. Historically, RVF was first recognized in 1930 in Kenya's Rift Valley. Since then, outbreaks of the disease have been reported in susceptible populations of several other countries in Africa including Botswana, Namibia and South Africa.

In 2010, tests conducted at BNVL indicated a RVF outbreak in Botswana, but the final confirmation came from South Africa's Onderstepoort Veterinary Institute (OVI). OVI used PCR and serological techniques for the diagnosis, techniques which were not available at BNVL at the time. Immediately after the disease was diagnosed, the outbreak was controlled by vaccination.

Through training and equipment provided by the Joint Division, the Botswana Department of Veterinary Services (DVS) is now able to carry out passive surveillance on animal abortion cases to ensure early disease detection and control. In addition, the BNVL has established PCR



testing systems within their labs and enzyme-linked immunosorbent assay (ELISA) systems to improve diagnostic capacity for rapid detection of RVF. This facilitates timely decision making by the authorities which, in turn, helps to improve the protection of public health.

BNVL implemented a quality management system according to ISO Standard 17025 and received accreditation for seven of the tests in 2007, and continues to work towards complete accreditation. Implementation of the management system is important for ensuring the quality of test results, which is required for effectively controlling diseases in the country and also for export purposes.

The Joint Division supported BNVL in the improvement of its management system through scientific visits to accredited laboratories and expert missions. By 2012, BNVL had increased its number of accredited tests to 22 – comprising food microbiology (14), histopathology (1) and serology (7). This accreditation, which is an on-going process that requires continuous improvement, contributes to the competitiveness of the livestock industry in accessing international markets.

Partners:

Ministry of Agriculture, Botswana

Botswana National Veterinary Laboratory

For further information

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Joint FAO/IAEA Programme
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