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# Namibia: an example of international cooperation in the study of emerging diseases

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**Summary**

The *Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise 'G. Caporale'* (IZS A&M) has been engaged for many years in research and studies designed to increase knowledge and expertise when dealing with 'exotic diseases' namely, those diseases which are not present in a country. To achieve these objectives, it is important to create cooperation networks with laboratories and research organisations at national and international levels. The relationship between the IZS A&M with Namibia in particular and, more recently with Botswana, are proving to be very valuable to mutual technical/scientific growth. In 2005, the National Reference Centre for the Study of Exotic Diseases set up its own Virology Laboratory at the Windhoek Central Veterinary Laboratory where the Namibian and IZS A&M personnel, working towards common goals, share diagnostic responsibilities and scientific research. The authors describe the activities involved in this joint project.

**Keywords**

Animal, Cooperation, Exotic disease, Health, Italy, Namibia.

## Introduction

For many years, the *Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise 'G. Caporale'* (IZS A&M) in Teramo, Italy, has been involved in research and studies designed to further knowledge and expertise in dealing with 'exotic diseases', namely diseases that are not present in Italy or diseases which, though present in Italy, are considered to require a high level of expertise to ensure that the disease does not become endemic or does not spread.

To achieve these objectives, cooperation networks were established with laboratories and research organisations at both national and international levels; these must include countries of the Mediterranean Basin, the Balkans, the United States and countries of Latin America, Central and southern Africa. As a result of this constant commitment over the years, the Institute was appointed by the former Ministry of Health as the National Reference Centre for the Study of Exotic Diseases (CESME) by decrees of 2 May 1991 and 4 October 1999 (1, 2).

At the international level, the World Organisation for Animal Health (*Office International des Épizooties*: OIE) designated the IZS A&M as a collaborating centre for veterinary training, epidemiology, food safety and animal welfare and as a reference laboratory for contagious bovine pleuro-pneumonia, bluetongue and brucellosis.

These designations encouraged further improvements of the performance and skills of staff working in these specific fields. To obtain the skills, the Institute improved and reinforced its working relationships with several countries in Africa.

These projects are useful to both parties, since:

- market globalisation and climate changes that have taken place in recent years increase the risk that some diseases, which were limited to sub-Saharan Africa until a few

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years ago, will occur in the Mediterranean Basin, as has already occurred in the case of bluetongue and West Nile disease

- they lead to an in-depth knowledge of diseases that would otherwise only be studied academically
- they improve the possibilities of developing valid, sensitive and specific diagnostic methods, to ensure that all parties are ready to deal with epidemic emergencies
- they enable the testing of vaccines for disease control
- they facilitate the manipulation of pathogens in the areas in which they are present naturally
- they provide a technical and scientific contribution to developing countries and are a useful aid for the improvement of the safety of animal products, which is essential for the alleviation of poverty and for increasing food safety and sustainable development; in the southern hemisphere, animal diseases, especially epizootic diseases, cause high rates of morbidity and mortality, endanger the quality and quantity of animal products and discourage private investment in the sector
- with the globalisation of markets and the introduction of health measures to protect the international market system and consumers, it has become essential to focus on the control and eradication of all diseases that hinder the free circulation of products of animal origin; to meet this challenge, it is essential to achieve and maintain high-quality health standards.

The relationship between the IZS A&M and Namibia in particular, and recently Botswana, are stimulating mutual technical/scientific growth. Strong ties and cooperation exist with Namibia since 1996.

Namibia is an arid and semi-arid country; many of its regions have no more than 400 mm of rainfall a year and only half of its territory can be used for arable farming and animal husbandry. Stock rearing is the most important sector of the economy after mining. Its strong point is cattle rearing, with 2.4 million head, and sheep and goat husbandry, with 2.7 and 2.1 million head, respectively. Approximately one million inhabitants, half the country's population, earn a living from agriculture.

However, livestock is under the constant threat of epidemics, such as foot and mouth disease and contagious bovine pleuro-pneumonia, which remain the greatest dangers due to movements of animals from neighbouring countries.

To control these two diseases, the border area between Angola and Zambia is classed as a quarantine area by the veterinary authorities. A physical barrier, which runs into Namibia at a depth of approximately 100 km from the northern border of the country, separates the quarantine area from the rest of its territory. Traditional animal husbandry in communal areas predominates to the north of the barrier, while the numerous commercial farms to the south export beef and lamb to countries in the European Union and to South Africa.

Every year, the Namibian Directorate of Veterinary Services performs approximately 500 000 foot and mouth disease vaccinations and 900 000 contagious bovine pleuro-pneumonia vaccinations in the area to the north of the health barrier. Stockbreeders also contribute, on their own initiative, to the control by vaccination of some diseases, such as anthrax, brucellosis, rabies, clostridiosis, botulism, lumpy skin disease, Rift Valley fever, bluetongue and African horse sickness.

The breeding of horses, which do not exceed 50 000 head, is also well established. Most of the animals are sports horses, racehorses and thoroughbred stud horses that are exported to South Africa, Europe and the Arabian Peninsula.

Since 1996, the collaboration between the IZS A&M and the Central Veterinary Laboratories (CVL) of the Ministry of Agriculture, Water and Forestry (MAWF) in Windhoek has focused on contagious bovine pleuropneumonia and specifically on studying the pathogenesis of the disease and the efficacy of vaccines in use.

This collaboration became official in 2005; the first stage was a Memorandum of Under-standing between the MAWF Veterinary Services and the IZS A&M followed, in 2007,


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by a scientific cooperation agreement between the MAWF and the Italian Ministry of Health.

Lately, the MAWF has requested the services of an IZS A&M senior veterinary officer to act as the CVL's head of research and diagnostic activities.

In collaborating with the Namibian Veterinary Services, the IZS A&M is also providing technical/scientific support, guidelines and international directives to increase the size of the areas authorised to export beef to both European Union and other countries.

In 2005, the CESME set up its own virology laboratory at the Windhoek CVL (Fig. 1), where the Namibian and IZS A&M staff work together to achieve common goals, share diagnostic responsibilities and scientific research. Common interests have been focused on diseases such as African horse sickness, equine encephalosis, Rift Valley fever, ephemeral fever, lumpy skin disease (Fig. 2), dourine and heartwater.



Figure 1
Virology Laboratory of the National Reference Centre for the Study of Exotic Diseases (CESME) at the Windhoek Central Veterinary Laboratory

Between 2006 and 2008, particular attention was paid to African horse sickness and differential diagnosis with equine encephalosis. African horse sickness was identified as a priority due to its close aetiological and epidemiological links with bluetongue and the consequent risk of its introduction to the European continent. The aim of the IZS A&M was to train a task force of Italian veterinary surgeons who were able to



Figure 2
Bovine affected by lumpy skin disease

recognise the disease clinically and take prompt action should it occur in Italy. Great importance was placed on the production of innovative diagnostic assays and the development of safe vaccines which can be used in case of need. The requirement to conduct differential diagnoses between equine encephalosis and African horse sickness, identified by the Namibian Veterinary Services as a priority, is a perfect example of the positive results of joint work between IZS A&M and the Namibian Veterinary Services (Fig. 3).



Figure 3
Tiberio Di Mattia with a horse breeder in Namibia

Support for Namibian veterinarians working in the field and engaged in the diagnosis and prevention of African horse sickness took the form of practical applications of traditional diagnostic tests, such as virus isolation and the

development of more innovative tests such as reverse transcriptase-polymerase chain reaction (RT-PCR) and real-time RT-PCR, which enable rapid identification of sick animals. These methods were subject to the quality standards used at the IZS A&M. Standard operating procedures were drafted and the virology laboratory was managed in accordance with UNI ISO 17025. The activities performed by the CESME virology laboratory in Namibia have had repercussions throughout the CVL which has gained new diagnostic expertise and skills in the use of the quality system. It has been decided that the CVL will apply to the South African National Accreditation System for accreditation in 2009; this of course makes the scientific collaboration provided by the IZS A&M, highly strategic.

The collaboration with government and private veterinarians was characterised by the identification of leaders, namely the vets with the greatest experience, who act as 'informal consultants' to numerous colleagues. Telephone and e-mail contact has been established with them, leading to the collection of information from the field, thus providing real-time test results.

The provision of reliable and rapid services has increased the confidence of clients in the diagnostic laboratory. A mechanism has been created which has resulted in an increasing supply of samples submitted for examination.

Moreover, using the CVL's experimental farm, hyperimmune sera have been produced for the African horse sickness serotypes and hyperimmune sera are produced for Rift Valley fever, lumpy skin disease and heartwater. These reagents have been and will be used both in Italy and at the CVL.

During meetings with Namibian veterinarians, during the stage of raising awareness of the IZS A&M activities, the veterinarians highlighted the need for inactivated monovalent African horse sickness vaccines, specific for the serotypes circulating in the country. Tests are currently being conducted to evaluate the safety and efficacy of such a product.

## Conclusions

Veterinary public health, food safety and safeguarding the health of livestock are the core of the national and international cooperation policy adopted by the IZS A&M which has produced and exported innovations for over 15 years. Over 100 international cooperation projects have been implemented in recent years and the Institute's staff are constantly engaged in making their technical/scientific skills available to European and non-European countries alike. Since 1996, the Institute has conducted cooperation and support activities with the Namibian Government in the field of scientific research into diseases of domestic animals, considered as 'exotic diseases' as far as Italy is concerned (Figs 4, 5, 6 and 7). The activities of the IZS A&M in Namibia are also designed to reduce the quarantine area in the north of the country where the largest number of traditional stockbreeders are located. This policy falls within the framework of inter-laboratory cooperation projects between the southern and northern countries of the world, promoted by the OIE by means of twinning projects.



Figure 4
Massimo Scacchia in front of Central Veterinary Laboratory in Luanda

The result of the measures described will undoubtedly lead to an increase in the scientific knowledge of both Italians and Namibians alike and, above all, will lead to a reduction in poverty among the rural


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populations of Namibia. This approach is summed up by the following motto: 'Treating animals makes life better for humans'.



Figure 5
Massimo Scacchia with cattle breeders in Zambia



Figure 6
The Livingstone Laboratory, Zambia



Figure 7
Cattle breeding in Kasungula, Zambia

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