

# EPIDEMIOLOGY REPORT

### Bovine brucellosis: what is going on?

In the veterinary community, brucellosis is a well-known zoonotic disease and the importance of its control is understood. Most veterinarians can name a friend or colleague who has contracted brucellosis and suffered greatly as a result. Even the famous veterinarian and author, James Alfred Wight (better known by his pen name of James Herriot) contracted brucellosis during his career and suffered for many years from recurring attacks of fever and depression caused by the bacterium. Additionally, brucellosis can have a devastating economic effect on herds that become infected, in the form of production losses and direct losses of livestock that must be slaughtered to control the disease.

Western Cape

Government

Aariculture

Despite its severe influence in the agricultural community, lay people are largely ignorant of the existence of brucellosis. This was not always the case. As recently as the beginning of the 20th century, over 3600 cases of brucellosis were reported in British soldiers stationed on the Mediterranean island of Malta per year, warranting the military hospital to have a special ward reserved for soldiers suffering from "Malta fever", today known to be caused by Brucella melitensis. When researchers discovered that the disease was contracted by the drinking of unpasteurized goats' milk, the British Armed services banned the drinking of goats' milk by soldiers. The hospital ward was soon converted into a ballroom due to the dramatic decrease in the number of Malta fever patients.

Today, there are public health measures in place worldwide to protect members of the public against contracting the disease, namely, regular testing of commercial dairy herds and pasteurisation of milk. However, due to the nature of the disease, it is not possible to say with certainty that the prevalence in the human population is low. Clinical brucellosis in people causes non-specific signs such as fever, malaise, joint pain and depression and many doctors are not aware of the disease or how to diagnose it. As a result, those who are diagnosed are usually diagnosed late into the progression of the disease when treatment is less effective and the illness can become chronic. It is therefore possible that many people in South Africa are affected by brucellosis without knowing the cause.

In South Africa, several *Brucella* species are present, but bovine brucellosis caused by *Brucella* abortus constitutes by far the majority of reported cases. The number of outbreaks of bovine brucellosis in the country is high (fig 2), and in the last decade, the incidence of bovine brucellosis has been increasing. The reasons for this observed increase are not clear, but there are several factors which may have played a role, including an increase in the uncontrolled movement of cattle and a lack of vaccination of susceptible animals, possibly due to ignorance or lack of access to vaccine.

An erroneous belief exists that because brucellosis is a state-controlled disease by law, that the state alone is responsible for controlling it. This is, of course, false. Without the co-operation of the public, control of any disease is impossible. Without commitment and pro-active participation of all involved parties in a disease control programme, no progress towards disease eradication can be made. For instance, while the state handles the guarantine and action plan for farms where the disease is already present, livestock producers and their private veterinarians are responsible for putting in place several measures to prevent infection of their cattle with brucellosis, and/or minimize the effect of the disease, including strict biosecurity, vaccination and regular herd testing. In fact, animal owners are required by the Animal Diseases Act to take all reasonable measures possible to protect the health of their animals and prevent the spreading of any pathogen.

That commitment from all parties is essential to control brucellosis can be seen in the example of the eradication of Brucella melitensis from Malta. Despite knowing the cause and transmission methods of the disease since 1906, it took Malta almost 100 years before it could declare the country free of brucellosis in 2005. When pasteurization became available on the island in the 1930s, a control prgramme commenced to rid the island of brucellosis using vaccination of susceptible animals, public health measures to ensure safe milk was sold and regular testing and movement control to ensure healthy goat herds. The programme was largely unsuccessful due to lack of co-operation from the local population, many of whom refused to believe that their goats could be carrying a disease, moved goats at night to avoid movement control and didn't observe hygiene practices. Finally, a massive education programme started in 1996 reached all people on the island and together with strict legal control of animal testing and movement, often enforced by vigilantes, resulted in the eradication of the disease from the island.

In South Africa, in an effort to combat the current situation, State Veterinary Services and the National Animal Health Forum have come together to control brucellosis with the aim of eradicating the disease from South Africa in the future.

#### **Bovine brucellosis continued**

The first step in designing an effective brucellosis control strategy in South Africa is to determine the true prevalence of the disease in the country. While regular testing of dairy herds is compulsory, it is not for beef herds, leading to the belief that the prevalence of the disease is higher than that which has been reported.

At the same time, key factors that help or hinder the current control of brucellosis should be identified in order to modify the current control programme for maximum efficacy.

To assist with the first step of a new brucellosis control strategy, information regarding farms currently infected with brucellosis in the Western Cape was collated. There are currently 12 farms under quarantine in our province for bovine brucellosis (fig 1).

Although the observation has been made in other provinces that bovine brucellosis is especially a problem in smallholder or non-commercial farmers, this does not appear to be the case in the Western Cape. Veterinary Services officials perform regular *Brucella* testing for noncommercial farmers and in areas where livestock are kept communally. All current outbreaks of brucellosis in the province are occurring on commercial cattle farms.

While it is encouraging that the evidence suggests that brucellosis has not established itself in communal livestock of the Western Cape, it is vital to prevent the disease from entering these populations. In situations where there are no fenced-off pieces of land that can be placed under quarantine, disease control becomes much more difficult.

#### **References and further reading**

Mbizeni, S. (2015) Brucellosis in South Africa: Progress and challenges. Department of Agriculture, Forestry and Fisheries. http://repository.up.ac.za/bitstream/ handle/2263/49187/mbizeni\_brucellosis\_sa2015.pdf? sequence=1&isAllowed=y

Wyatt, H.V. (2013) Lessons from the history of brucellosis. Scientific and Technical Review 32, 17-25. http:// www.oie.int/doc/ged/D12396.PDF



Figure 1: Farms in the Western Cape currently under quarantine for brucellosis

### Bovine brucellosis continued



Figure 2: Reported outbreaks of bovine brucellosis in South Africa between 2011 and 2015 (DAFF, 2016)

## **Disease and Surveillance**



### **Outbreak events**

- A cattery near Malmesbury experienced acute illness and deaths of two-week old kittens from several litters. Although there were no macroscopic post-mortem changes observed, Escherichia coli and Erysipelothrix rhusiopathiae (the causative organism of swine erysipelas) were cultured from liver samples. While E. rhusiopathiae is a pathogen that can infect most domestic animals, in this case it cannot be said with certainty to what extent each cultured bacterium contributed to the clinical signs seen in the affected kittens.
- Two ostrich farms near Heidelberg and Oudtshoorn, respectively, tested positive for H5N2 avian influenza in birds being raised for slaughter. While the first farm has had only serological reactions thus far, the second farm has tested PCR positive for H5 and N2. Further sequencing of the virus is underway. Wild birds are the suspected source of the infection.
- A hand-reared orphan calf on a farm near Beaufort West showed chronic keratoconjunctivitis, lacrimation, nasal discharge, weight loss and diarrhea. Blood sample taken revealed that the calf was infected with wildebeest-associated malignant catarrhal fever virus. The wildebeest are kept further than 10km away on the farm, but the calf may have had indirect contact with them through other animals with which they had been in contact. The affected calf was euthanased.



Control Animal Health Technician Malmesbury was called out to a suspect case of canine rabies. On inspection the dog showed classic nervous signs of distemper. The local SPCA removed and euthanased the dog.

A neonatal kitten (Photo: morguefile.com)

- Two sheep farms in the Malmesbury state vet area tested positive for Johne's disease after observing animals losing condition. The affected farms were placed under quarantine.
- A single case of clinical lumpy skin disease was observed in a herd of 30 cattle near Atlantis.
- Eight farms in the greater Vredendal area tested positive for *Brucella ovis*. On one farm, the affected rams had recently been brought in and were still in isolation, facilitating the control of the disease.
- A farm owner near Clanwilliam heard his dogs barking in the night and awoke to see them attacking and killing a bat-eared fox. When the fox tested positive for rabies, the farmer opted to have his two dogs euthanased as they had no record of being vaccinated against rabies. Dogs and cats in the area were vaccinated in a 10km radius of the case.
- Another bat-eared fox near Hopefield entered a property where it attacked a horse by jumping against it. It
  left the horse temporarily to attack a hosepipe and when it returned, was kicked and knocked unconscious.
  The farmer killed the incapacitated fox, which subsequently tested positive for rabies. The horse and two
  pot-bellied pigs on the property were vaccinated. Co-incidentally, a vaccination campaign of dogs and cats
  took place in Hopefield on the day of the attack.
- A clinical case of diamond skin disease (erysipelas) was picked up in the carcass of a pig that originated from a free-range farm near Worcester. Several pigs had been caught and kept on a trailer for the night (a practice which is not legal) before being transported to the abattoir. It is likely that the stress of this treatment contributed to the development of clinical signs in the pig.

Epidemiology Report edited by State Veterinarian Epidemiology: Dr Lesley van Helden (lesleyvh@elsenburg.com) Previous reports are available at www.elsenburg.com/vetepi Disclaimer: This report is published on a monthly basis for the purpose of providing up-to-date information regarding epidemiology of animal diseases in the Western Cape Province. Much of the information is therefore preliminary and should not be cited/utilised for publication