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Faculty of
Veterinary Science

Fakulteit Veerartserykunde
Lefapha la Diseense tsa Bongakadiruwa

Zoonotic Diseases

Department of Tropical Diseases

Make today matter



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Introduction

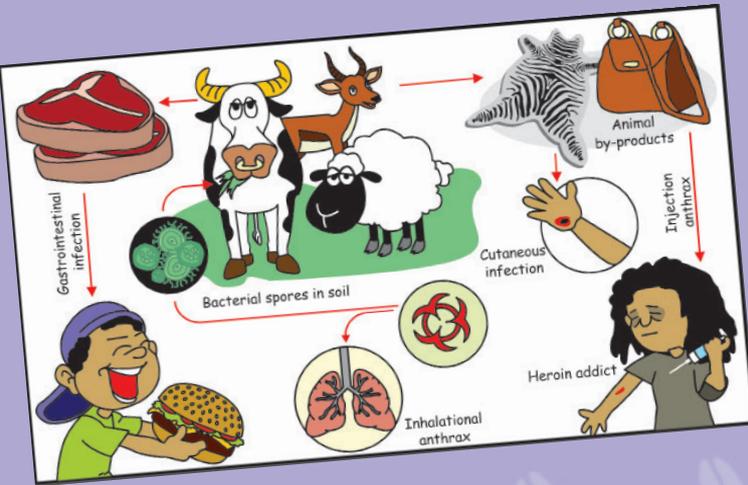


The idea for Zoonotic Diseases awareness material was initiated by the Department of Tropical Diseases at the Faculty of Veterinary Science, University of Pretoria, where the researchers found that very limited awareness material of zoonotic diseases was available. Expert(s) on each diseases contributed towards the zoonotic diseases awareness material. The researchers that contributed to the information where from different faculties at the University of Pretoria, Gauteng Department of Agriculture and Rural Development (GDARD) and Agriculture Research Council – Onderstepoort Veterinary Research campus. The graphic designer of the faculty of Veterinary Science designed the awareness material in a user-friendly format.

A multidiscipline and multi-university postgraduate student group used this awareness material in a One Health Day in 2016. The student project won the South Africa (national) student-led One Health-initiative competition in 2016 and was awarded a special recognition prize for the international student One Health day.

Anthrax

Anthrax is an infectious bacterial disease transmitted from animal to human (zoonosis) through consumption and industrial handling of contaminated meat and animal by-products and from animal to animal through exposure to infected forage or animal remains in the environment.



Causes

Bacillus anthracis is a gram positive endospore forming environmental bacterium

Transmission

Humans get anthrax through skin abrasions with contaminated animals products (hides and wool) or through consumption of infected meat. It is also transmitted through contaminated illegal opiates and exposure to large concentrations of spores (latter only when used as bioweapon).

People at risk

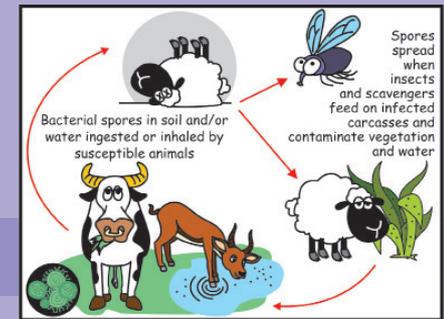
- People who consume infected meat
- Tannery workers
- Wool shearers and sorters
- Heroin addicts
- Laboratory technologists
- Butchers

Clinical symptoms in humans-

Dependent on mode of infection:

- Oedema
- Black eschars
- Fever
- Fatigue
- Diarrhoea
- Coughing up blood
- Chest pain

How does this disease affect animals?



Clinical signs in animals

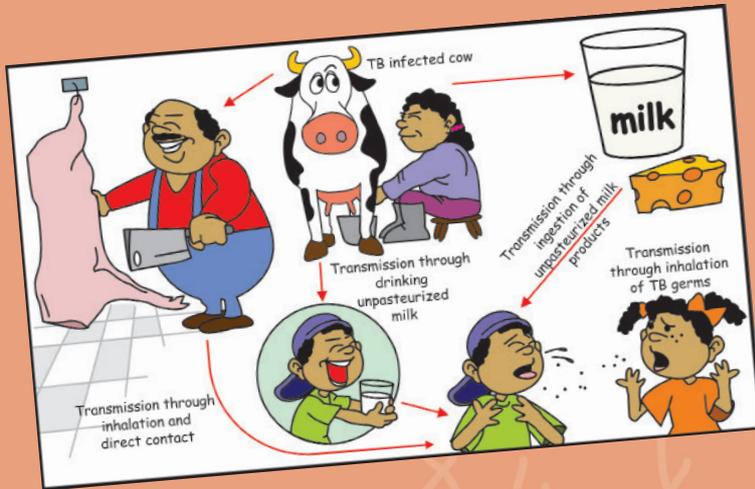
- Sudden death
- Oedema
- Dark non-clotting blood
- Bleeding from orifices
- Shortly before death, fever, muscle tremors, convulsions and collapse

Preventative measures

- Vaccinate animals yearly against anthrax
- Antibiotic prophylaxis when exposure is suspected
- If, animal dies of anthrax, notify state veterinarian and ensure proper disposal of carcasses

Bovine Tuberculosis (BTB)

Bovine tuberculosis (BTB) is a chronic debilitating disease in cattle and other mammalian species including humans.



Causes

Bovine tuberculosis is caused by *Mycobacterium bovis* (*M. bovis*), a member of the complex species. The primary bacterium that causes tuberculosis in humans is *M. tuberculosis*.

Transmission

People are most commonly infected with *M. bovis* by drinking or eating contaminated and unpasteurised milk and milk products. Infection can also occur through direct contact with a wound of an infected animal during slaughter or hunting, or by inhaling the bacteria exhaled by animals infected with *M. bovis*. Direct transmission from animals to humans through inhalation is thought to be rare, but *M. bovis* can be spread directly from person to person when infected people cough or sneeze.

People at risk

- People who drink raw milk and products made from it
- People eating undercooked meat from infected animals
- Veterinarians
- Abattoir and farm workers
- Animal Health Technicians
- Butchers
- Hunters

Clinical symptoms in humans

- Fever
- Coughing
- Night sweat
- Loss of appetite
- Weight loss
- Abdominal pain
- Diarrhoea
- Infected person can die if the disease is untreated
- Coughing up blood
- Chest pain

How does this disease affect animals?

Clinical signs in animals

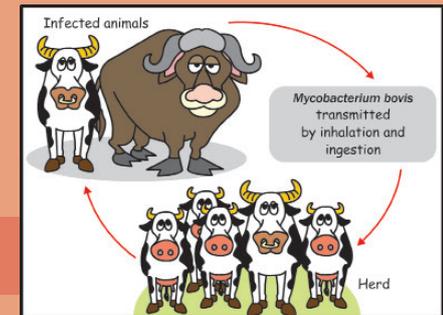
- Clinical signs are absent in early stages
- Advance stages: emaciation, weakness, anorexia, pneumonia with a chronic cough, dull coat colour
- Lymph nodes may be enlarged

Preventative measures

- Purchase tuberculosis negative animals
- Regular testing
- Remove sick animals from the herd

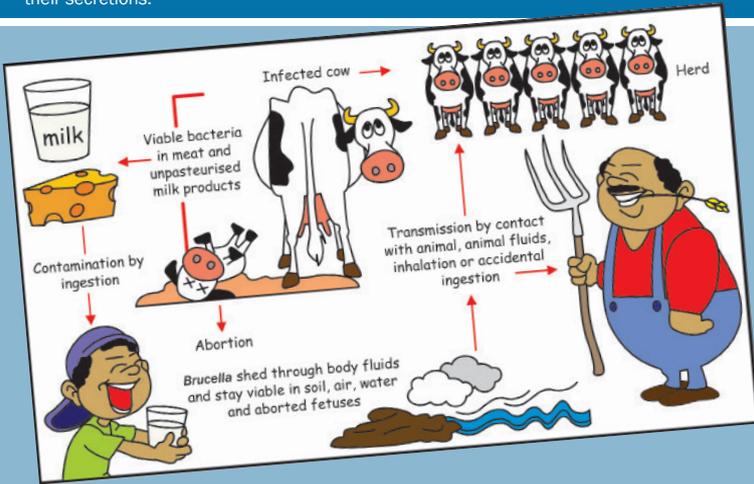
Preventative measures

- Don't drink unpasteurized milk
- Don't eat unpasteurized milk products
- Don't eat uncooked meat
- Avoid close contact with infected animals, their wounds or meat
- Always wash and disinfect hands after working with animals/or animal by-products



Brucellosis

Brucellosis is a highly infectious bacterial disease of cattle, sheep, goats and pigs caused by ingestion of raw milk or undercooked meat from infected animals or close contact with their secretions.



Causes

- *Brucella abortus* (from cows)
- *Brucella mellitensis* (from sheep/goat)
- *Brucella suis* (from pigs)

Transmission

Brucella can be transmitted from animals to humans by ingestion of infected food products, direct contact with infected animals or inhalation of aerosols.

People at risk

- Veterinarians
- Animal health assistants
- Abattoir workers
- Livestock handlers

Clinical symptoms in humans

Clinical signs may occur from week, months to years

- Septicemia
- Loss of appetite
- Headaches
- Chills
- Night sweating
- Weight loss
- Joint pain
- Muscle pain
- Back pain
- Orchitis

Preventative measures

- Vaccinate animals
- Always put on your protective clothes (gloves, boots and overalls) during work
- Do not eat raw or improperly cooked meat
- Do not drink unpasteurized milk
- Wash and disinfect hands after working with animal byproduct

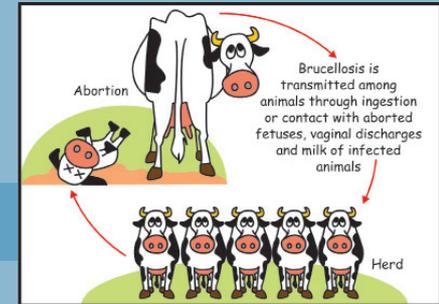
How does this disease affect animals?

Clinical signs in animals

- Abortion (abortion storm), especially at last trimester of pregnancy
- Reduced fertility rate and low calve crop yield
- Weak calves
- Prolonged calving interval
- Arthritic joint (joint pain)
- Retained placenta
- Reduced milk production
- Swelling of joints (hygroma)

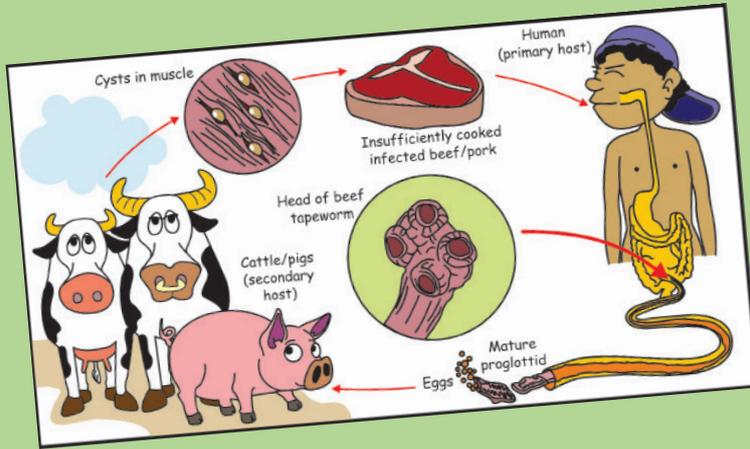
Preventative measures

- Vaccinate your animals against brucellosis
- Report any abortion in the herd to your local veterinarian and test the herd
- Remove sick animals from the herd or flock
- Purchase brucellosis negative animals with vaccination record



Cysticercosis

Cysticercosis is a muscular infection of cattle and pigs commonly known as beef/pork measles caused by zoonotic tapeworms. Humans can also suffer from cysticercosis, if they accidentally ingest beef/pork tapeworm eggs.



Causes

Larval stage of the zoonotic tapeworms:

- *Taenia saginata* (beef tapeworm)
- *Taenia solium* (pork tapeworm)

Transmission

- Animals become infected either by ingesting tapeworm eggs directly from human faeces, or by ingesting food/water contaminated with sewage sediment distributed on pasture
- Humans become infected by consuming food/water contaminated with beef and pork tapeworm eggs to large concentrations of spores (latter only when used as bioweapon).

People at risk

Human cysticercosis:

- Anyone drinking untreated water or consuming foods (e.g unwashed vegetables) that might be contaminated with tapeworm eggs from human faeces

Taeniosis:

- Anyone consuming raw/under cooked beef/pork
- Anyone consuming uninspected beef/pork

Clinical symptoms in human

There are no clinical signs for bovine and porcine cysticercosis, however in humans, once ingested, the eggs hatch into larvae which penetrate the intestinal wall and circulate to various tissues such as:

- skin (subcutaneous cysticercosis): associated with lumps under the skin
- eyes (ocular cysticercosis): associated with blindness

- brain (neurocysticercosis): associated with headaches, epileptic seizures, blindness, mental disturbances and death

Preventative measures

Cysticercosis

- Improvement in sanitation
- Both humans and animals to avoid ingesting feeds from sewage, contaminated pastures/crops and water from contaminated sources

Taeniosis (adult tapeworm infection in humans)

- Wash hands with soap and water after handling carcasses and using the toilet
- Do not eat raw or improperly cooked meat

Treatment

Regularly take anthelmintic treatment to kill tapeworms

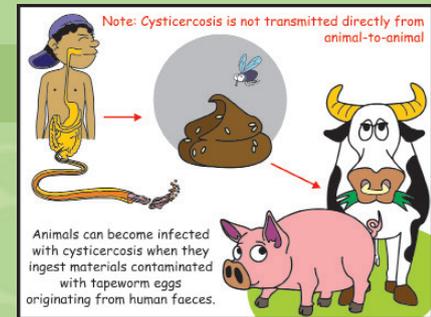
How does this disease affect animals?

Clinical signs in animals

- Cysticercosis infections in cattle and pigs are unlikely to produce any clinical signs

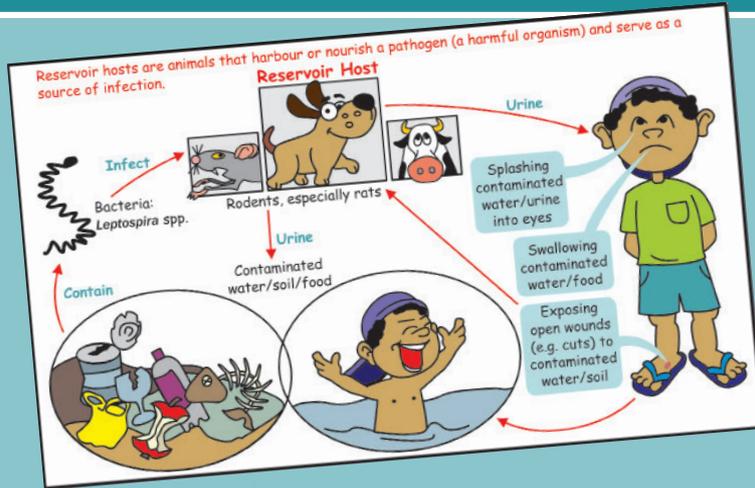
Preventative measures

- Avoid human faecal contamination of animal feed and feeding areas



Leptospirosis

Leptospirosis is an infectious disease transmitted from animal-human-animal (zoonosis) and from animal to animal through infected urine.



Causes

Leptospira species

Transmission

Leptospira can be transmitted through water and soil contaminated through infected animal urine, swimming in contaminated water or body fluids of infected animals.

People at risk

- Farmers
- Mine workers
- Sewer workers
- Slaughterhouse or abattoir workers
- Veterinarians/animal caretakers
- People swimming in contaminated water

Clinical symptoms in humans

- Petechial rash, conjunctivitis (red eye), sneezing, sore throat

Other symptoms include:

- Fever, chills, headache, muscle aches, vomiting, diarrhoea, abdominal pain, jaundice, etc.

Preventative measures

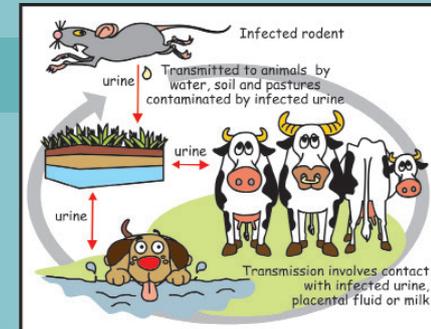
- Avoid contact (swim, walk, or swallow water) with animal urine or body fluids
- Cover up (gloves, boots, eye protection, overalls and face masks)

- Remove protective clothing before going home
- Wash hands with soap and water after handling animals or carcasses
- Control rodents
- Minimise dust where animals are housed
- Vaccinate dogs against leptospirosis to break the chain of transmission from animals to human

How does this disease affect animals?

Clinical signs in animals

- Drop in milk, abortion, mastitis and low fertility/infertility in cattle
- Fever
- Vomiting
- Diarrhoea
- Refusal to eat
- Severe weakness and depression
- Stiffness
- Infertility



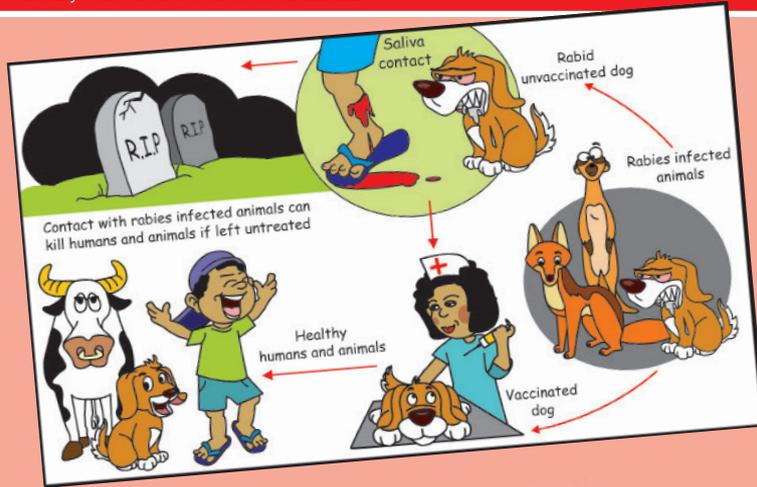
Preventative measures

- Control rodents from the environment
- Isolation of infected animals
- Treatment of infected animals using antibiotics (contact local veterinarian)
- Pasteurise milk
- Quarantine or testing of newly acquired animal(s)

*** Contact a veterinarian to vaccinate animals against leptospirosis.

Rabies

Rabies affects humans and other mammals but is most common in carnivores. Rabies is an acute viral disease of the central nervous system that is transmitted through saliva - usually from the bite of an infected animal.



Causes

Rabies virus, all rabies-related lyssaviruses

Transmission

Bites, licks and/or scratches from an infected animal

People at risk

- All people are at risk in
- South Africa
- Children under the age of 15 years that come into contact with animals are more susceptible to bite exposure
- Veterinarians
- Laboratory workers
- Animal handlers
- Farmers

Clinical symptoms in humans

- Tingling, pain or numbing sensation at the site of the wound
- Fever
- Hyperactivity
- Excited behaviour
- Hydrophobia (fear of water) and sometimes aerophobia (fear of moving air e.g. fan, wind)
- Paralytic rabies victims exhibit signs

of muscle paralysis, starting at the site of the wound

- All cases will result in coma and death

Preventative measures

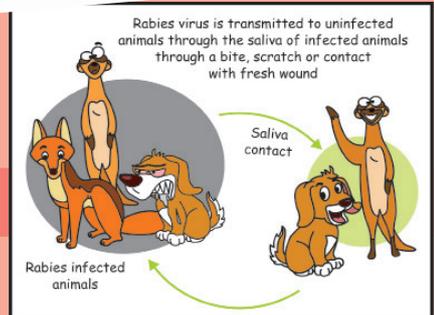
- Vaccinate dogs and cats
- Vaccination for humans is available (only high-risk individuals)
- Stay away from wild animals

PLEASE NOTE:
If exposed to saliva or a bite from an animal, wash the wound with soap and running water immediately. Go to nearest healthcare facility without delay and tell them about the possible rabies exposure.

How does this disease affect animals?

Clinical signs in animals

- Fever
- Loss of appetite
- Licking or chewing at the bite site
- Sudden behavioural changes
- Inability to swallow
- Lack of coordination, staggering
- Unusual shyness or aggression



- Progressive paralysis
- Excessive salivation or frothy saliva

Preventative measures

- Vaccinate dogs and cats



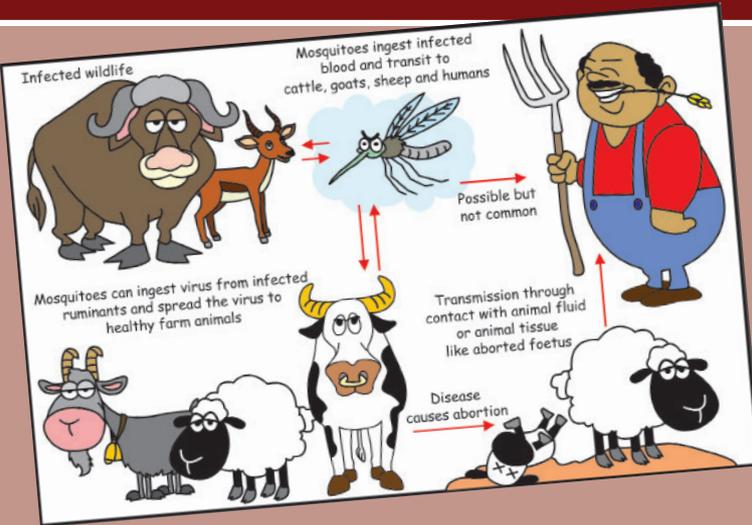
What can you do when you see an animal showing signs of rabies?

Stay clear of the animal and warn any other person nearby to do the same. Notify your local veterinarian or animal welfare organisation (e.g. SPCA) about the animal.

Do not try to approach, handle or restrain the animal yourself.

Rift Valley fever

Rift Valley fever is an infectious disease transmitted from animal to human (zoonosis) and from animal to animal through mosquito bites and contact with infected animal tissue.



Causes

Rift Valley fever virus within the genus Phlebovirus that is transmitted through mosquito bites.

Transmission

Rift Valley fever virus can be transmitted to animals through mosquito bites and contaminated tissue like abortion carcasses. Humans get infected when handling infected tissue from infected animal carcasses.

People at risk

- Farmers
- Slaughterhouse or abattoir workers
- Veterinarians/Animal caretakers
- Livestock handlers

Clinical symptoms in humans

- Fever
- Severe headache
- Malaise
- Muscle pains
- Nausea
- Severe infection can manifest either as encephalopathy, haemorrhagic syndrome or retinopathy

How does this disease affect animals?

Clinical signs in animals

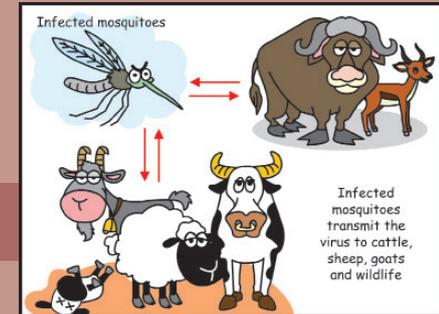
- Abortion storms
- High mortality in lambs less than 5-6 days old
- High fever
- Poor appetite
- Weakness
- Elevated respiratory rate
- Nasal discharges
- Vomiting and often abdominal pain
- Haemorrhagic diarrhoea in cattle

Preventative measures

- Vaccinate goats, sheep and cattle

Preventative measures

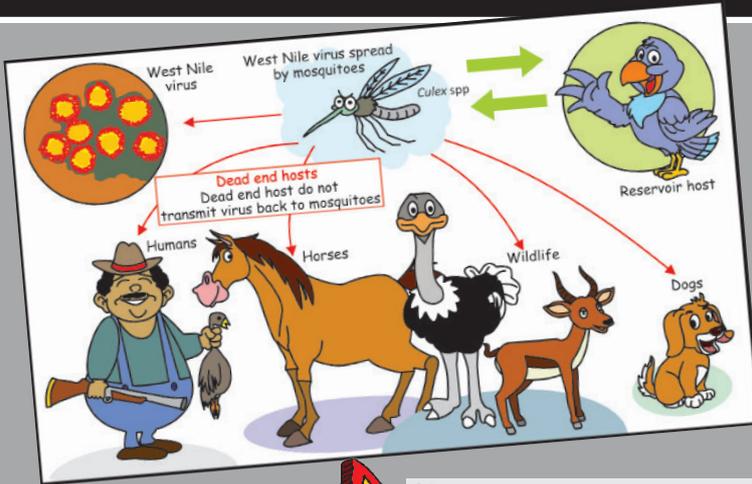
- Wear protective clothing (gloves, boots, eye protection, overalls and face masks)
- Wash hands with soap and water after handling animals or carcasses
- Remove protective clothing before going home
- Vaccinate animals against Rift Valley fever virus



Note: Notify veterinarian

West Nile virus

West Nile virus (WNV) is an infectious disease transmitted to humans, horses and other animals by mosquitoes that have fed on infected birds.



Causes

West Nile virus (WNV)

Transmission

WNV is an infectious disease transmitted to humans, horses and other animals by mosquitoes that have fed on infected birds. Horses and humans are dead end hosts and do not transmit WNV back to mosquitoes. Birds are the natural host of WNV.

People at risk

- People living in area where there are WNV infected mosquitos, especially those who work outside or participate in outside activities
- Animal handlers, laboratory personnel and veterinarians in contact with neurological tissue from infected animals

Note: WNV has the potential to infect many species and should be considered in unexplained neurological cases in species other than humans and horses although the importance has not been established in South Africa.

- People over 60 years old
- People with pre-existing conditions e.g. cancer, diabetes, hypertension, kidney disease and immunosuppression, including people that received organ transplants

back, stiff neck, eyes sensitive to light, and death

- Orchitis

Preventative measures

- Use mosquito repellents
- Protective clothing against mosquitoes
- Vaccinate horses against WNV (before the start of the rainy season following African horse sickness virus (AHSV) vaccine)

Clinical symptoms in humans

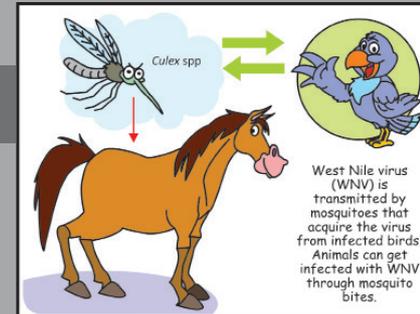
- Most people show no symptoms
- About 20% of infected people will develop West Nile fever with symptoms such as rash, fever, headache, nausea, joint and muscle pain
- <1% of cases develop WNV neurological disease with symptoms such as fever, severe headache, changes in mental status, weakness or paralysis, sore

Note: No vaccine to prevent WNV infection in people. People who suspect that they have symptoms of WNV should contact their nearest healthcare facility.

How does this disease affect animals?

Clinical signs in animals

- Fever, stumbling, general weakness, hind and/or front leg paralysis, muscle tremors, tongue paralysis, seizures and death.



Note: About 20% of infected horses show clinical signs and up to 90% of these animals have neurological signs; once signs appear the death rate is approximately 30%.

Contact Information



Antrax

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact henriette.vanheerden@up.ac.za or kidanemariama@arc.agric.za

Bovine Tuberculosis

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact Hlowkwe@arc.agric.za

Brucellosis

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact Henriette van Heerden or pottsA@arc.agric.co.za

Cysticercosis

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact TsetetsiA@arc.agric.za

Leptospirosis

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact pottsA@arc.agric.za

Rabies

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact paracon@rabiesalliance.org; an.dre.coetzer@rabiesalliance.org or terence.scott@rabiesalliance.org

Rift Valley Fever

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact jannie.crafford@up.ac.za

West Nile Virus

This brochure provides information for humans regarding the cause, transmission, clinical symptoms, people at risk and preventative measures as well as clinical signs and preventative measures for animals.

For more information, contact www.zoonosesresearchunit.up.ac.za or ZRU@up.ac.za



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