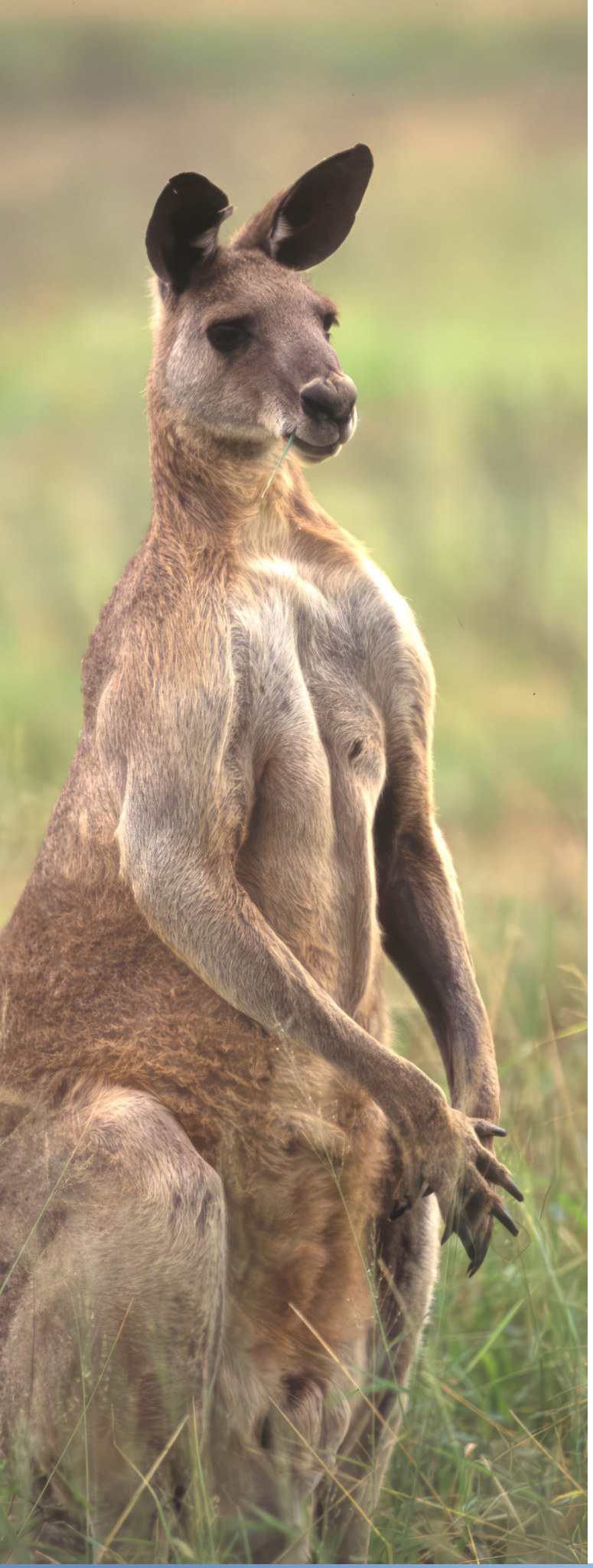
QUEENSLAND MUSEUM

Q fever

COMMUNITY AWARENESS

Queensland Government



This resource is to help the community learn more about Q fever, a zoonotic infectious disease.

This information is intended to be an introduction to Q fever, but may be useful for those doing further research in biology, infectious disease and epidemiology. It supplements other resources published by the Queensland Museum: **QM Health and Safety Resources** and QM Loans: **QM Loans**

The information profiles the following:

- Q fever - an infectious zoonotic disease.
- Identify key features of the bacteria.
- Modes of the disease transmission and including direct and indirect contact.
- Sources of outbreak and factors that affect the spread of disease.
- Vaccine development, immunisation and effectiveness of different strategies in controlling the spread of disease.
- Personal hygiene measures.

NOTE: After reading this booklet, an editable online workbook is available to test your knowledge on Q fever: **QM Health and Safety Resources**

Contents

2 Q fever – what is it?

3 The Q fever bacterium

4 Transmission and other factors

5 Spread of the disease

6 People at risk

7 Q fever control

8 Prevention

9 Exposure

10 Symptoms

11 Diagnosis and treatment

11 Complications

12 Vaccination

13 References

13 Further Queensland Museum resources

Q fever – what is it?

Q fever is an infectious zoonotic disease which can be transmitted from animals to humans.

Q fever is caused by the bacterium *Coxiella burnetii*, which can infect cattle, goats, sheep, and many other mammals and marsupials, as well as ticks.

Due to its public health significance, Q fever is a notifiable disease in all Australian states and territories under the National Notifiable Diseases Surveillance System (NNDSS), and, in Queensland, under the *Public Health Act 2005*. More than 450 cases of the disease are notified in Australia annually.

The bacterium is transmitted to humans by direct and indirect contact with infected animals, animal products or contaminated material. It can cause a range of symptoms from severe flu-like illness to debilitating fatigue and/or heart complications.

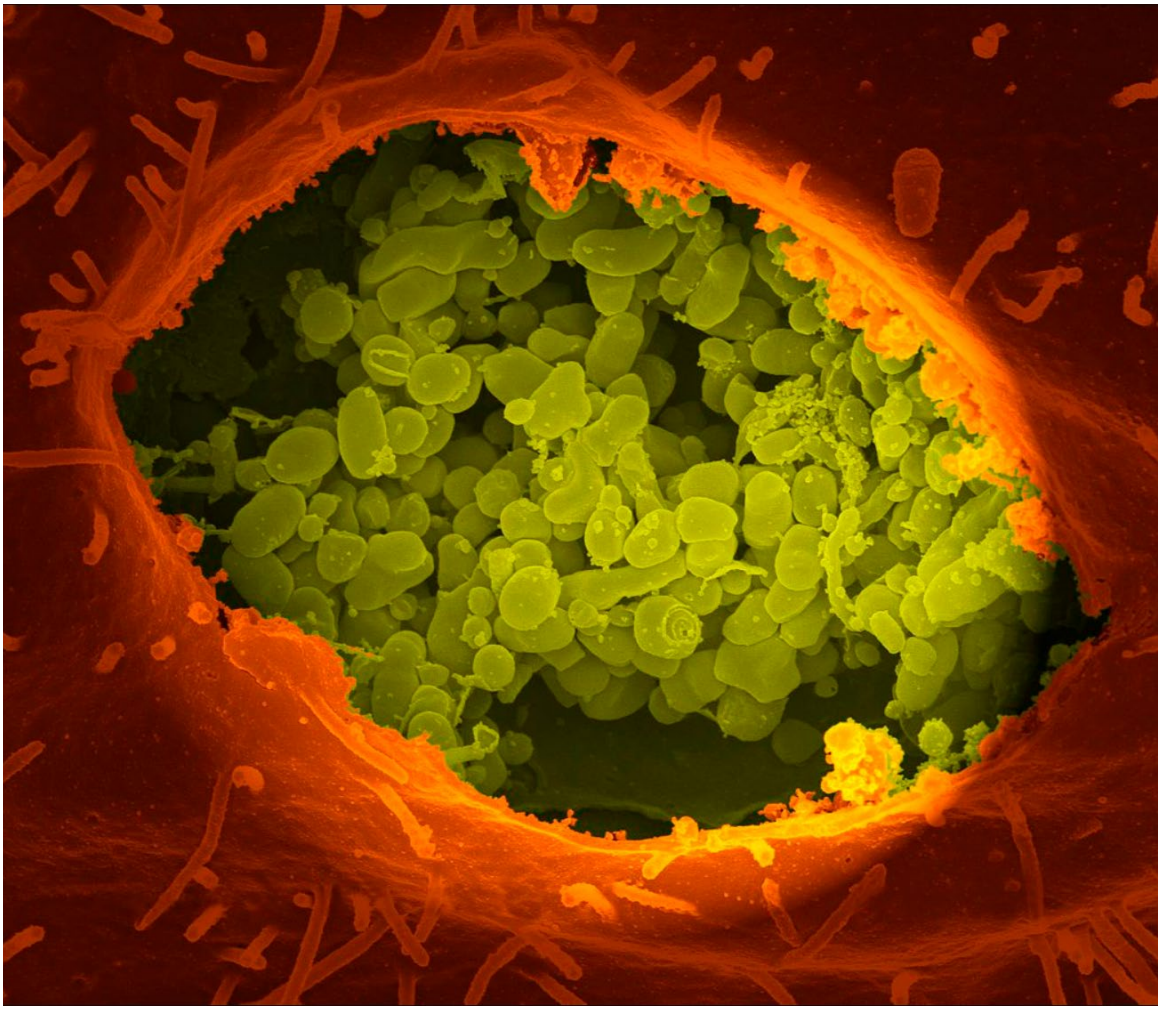
Cattle, sheep and goats are a common source of the infection, but a wide range of domestic and wild animals also can be infected and spread the disease.

The Q fever bacterium

The *Coxiella burnetii* bacteria is highly infective and can survive in the environment (in dust and soil) for months or years, so Q fever can be caught through contaminated farm products such as wool, hair, straw or hay.

Q fever bacteria are resistant to heat, drying, sunlight and many common disinfectants, allowing them to survive for more than a year in the environment.

The bacterium is transmitted to humans by direct and indirect contact with infected animals, animal products or contaminated material. As it is circulated through the body in the blood stream, any organ system can become affected, including the central nervous system, lungs, liver, kidney, testes and heart muscle and tissue.



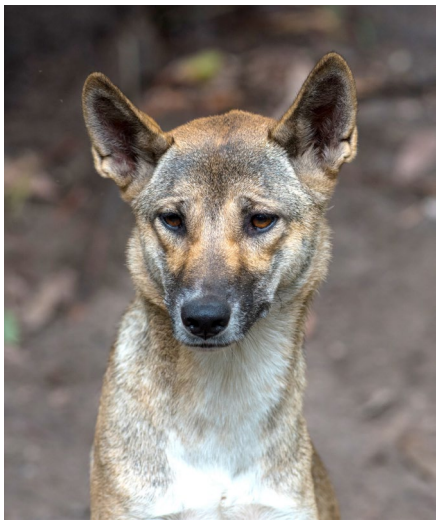
Transmission and other factors

Cattle, sheep and goats are a common source of infection, but a wide range of domestic and wild animals can be infected including: camels, llamas, alpacas, rodents, kangaroos, wallabies and other Australian wildlife, cats, dogs, horses, rabbits, pigs, foxes and bandicoots.

It is mainly spread from animal to humans via inhalation of infected particles in the air (such as contaminated dust) or through direct infection from contact with contaminated animal blood, faeces and urine, milk, meat, wool, hides, soil, grass, straw, clothes, and particularly animal birthing products.

Q fever is also recognised as an Australian endemic tick-borne disease. Ticks may transmit the infection from animals to humans through bites or through their tick faeces.

Spread of infection from person to person is very rare but can occur through transfusion of blood from a person with the infection and mother-to-baby transmission.



Spread of the disease

Humans may inhale infected dust or air particles, which can blow for a kilometre or more in dry and windy weather. People living in regional and rural areas are more at risk of breathing in contaminated dust and particles.

Areas contaminated with heavily infected animal birthing products can remain a risk for weeks after the birth of the young animals.

The bacterium can survive harsh conditions for many months in a dried state, either in the ground or attached to buildings, machinery, stock transport vehicles, straw, wool, hides or work clothing.

Infection to the general public may occur by visiting farms, zoos and animals shows, living in or near regional and rural areas where there is livestock and wildlife, or breathing in infected dust and air particles from fields and animal transport.

As housing estates expand into wildlife habitats throughout Queensland, humans are at increased risk of exposure to Q fever infection from wildlife and feral animals.

People at risk

Anyone who works or is in close contact with animals and animal products and waste produced from them.

Pregnant women; the elderly; people who have underlying illnesses that weaken the immune system; and people with aneurysms or heart disease are more likely to have severe illness and or complications.

The following occupations put an unvaccinated person at greater risk:

- Farm workers (cattle, sheep, goat farmers and graziers)
- Abattoir, slaughterhouse and tannery workers
- Meat workers and meat-packing plant workers
- Veterinarians (veterinary nurses/assistants/students)
- Agricultural college staff and students
- Wildlife workers
- Wool workers (shearers, sorters and pelt/hide processors)
- Laboratory workers (working with biological specimens)
- Animal shooters and hunters
- Dog and cat breeders (and anyone regularly exposed to animals who are due to give birth)
- Pet food manufacturing workers
- Dairy industry workers and those who work with raw milk
- People who mow lawns in areas with livestock and wild animals
- Laundry workers handling clothing from places that work with animals or animal products.

Q fever control

Prevention

1

- Vaccination Q-VAX® (15 years & over) – check with your doctor
- Wash hands after touching animals and before eating/drinking
- Eat and drink only pasteurised products
- Wear personal protective equipment for dirty animal work
- Shower and change clothes and shoes after dirty animal work
- Cover open wounds

Exposure

2

- Touching poo, urine, blood from infected animals
- Watching and assisting animal births
- Drinking raw (unpasteurised) milk
- Bites from ticks that have fed on infected animals
- Breathing in dust that contains the Q fever bacteria by living farms, visiting zoos and animals shows, mowing or digging (particularly if the land has kangaroos)

Symptoms

3

- Most people who are infected have no or mild symptoms:
- High fever, chills or sweats
- Tiredness
- Headache, sore throat, cough
- Nausea or vomiting
- Shortness of breath, chest or stomach pain
- Weight loss

See a doctor

4

- See your doctor if the flu-like symptoms persist and you have had exposure to animals (particularly cows, sheep, goats, kangaroos)
- The doctor will make the diagnosis and offer treatment

Diagnosis

5

- A diagnosis by the doctor is based on the symptoms and if you have come into contact with the bacteria in the previous six weeks
- Diagnosis usually requires a skin and blood test

Treatment

- Acute Q fever – early treatment is effective over approximately two weeks with course of antibiotics
- Chronic Q fever – usually requires a longer course of antibiotic therapy

Prevention

When handling animals — particularly sheep, cattle and goats — wash hands and arms thoroughly in soapy water (for at least 20 seconds) after any contact and before eating and drinking.

Eat and drink only pasteurised products (as the disease can be transmitted to humans through contaminated raw milk). Pasteurisation of milk and milk products will help prevent infection.

Wear personal protective equipment (following and correctly fitted to the manufacturer's instructions) when in contact with animal blood, faeces, urine and fluids.

Shower and change clothes and shoes after high-risk activities or being around animals. Wash clothes in detergent (disinfectant if heavily soiled with animal matter) to reduce the risk of infection to your household.

Cover open wounds when handling or disposing of animal products and waste.

Exposure

Direct exposure

- Contact with animal faeces (poo), urine (pee) or blood from an infected animal
- Drinking raw (unpasteurised) milk
- When observing or assisting with animal births and contact with animal birth products/fluids (tissue, placenta, blood, mucus)
- While being present for the slaughtering or butchering of infected animals or handling infected animal tissue, fluids or excretions, animal products or materials
- Contact with contaminated wool, hides and straw, or manure fertiliser and clothes that have been worn when working with animals
- Transfer of the infection via tick bites that have fed on the blood of infected animals
- While herding, shearing or transporting animals.

Indirect exposure

- Breathing in infected dust or air particles carrying dried up infected animal and tick excreta from an infected area
- While mowing grass in areas contaminated by infected animal excretions
- When visiting, living or working in or near livestock farms, abattoirs, sale yards or stockyards housing cattle/sheep/goats, meat works, agricultural exhibitions/shows, land being fertilised with untreated animal manure
- From contaminated clothes, shoes or equipment.

Symptoms

Symptoms in animals

Animals with Q fever don't usually look sick, but they can spread the bacteria to humans.

Q fever can sometimes cause animals to miscarry or have stillborn babies. These births are likely to contain infectious bacteria.

Symptoms in humans

Many infected people have no symptoms. People who do become sick often have a severe flu-like illness. Symptoms begin about two to four weeks after coming into contact with the bacteria.

Others will experience signs or symptoms (mild or severe) that include:

- fever, chills or sweats (profuse perspiration)
- fatigue (tiredness)
- headaches (often behind the eyes)
- sore throat
- muscle aches
- nausea, vomiting or diarrhea
- chest pain
- upper respiratory problems
- weight loss
- cough.

Diagnosis and treatment

Most people who are infected with *Coxiella burnetii* have no or mild symptoms and will recover without antibiotic treatment.

If flu-like symptom persists, consult a doctor. Early treatment for acute Q fever is effective with a course of oral antibiotics, but any chronic Q fever may require a longer course of antibiotic therapy.

Q fever is diagnosed through examination of a skin test and a blood sample from the patient.

A diagnosis is based on symptoms and whether the person may have come into contact with the bacteria in the previous six weeks.

Complications

If flu-like symptoms persist, consult your doctor immediately.

Acute Q fever can develop with a fatigue syndrome, which could last more than 12 months.

Untreated or inadequately treated Q fever can go into long periods of remission, sometime lasting years.

In a very small number of cases (less than 4%), Q fever leads to a more serious illness known as chronic Q fever.

Some symptoms of chronic Q fever are:

- inflammation of the inner lining of the heart (endocarditis)
- damage to other organs
- hepatitis (inflammation of the liver)
- osteomyelitis (inflammation of the bone or bone marrow)
- infections of the bone (osteitis).

Death from Q fever is very rare.

Vaccination

Vaccination (Q-VAX®) is the best way to prevent Q fever infection. Currently Australia is the only country with the licenced Q fever vaccine.

Q fever is a notifiable disease in Australia and Q fever vaccinations are recorded on the Australian Immunisation Register (AIR) by your doctor or vaccine service provider.

Vaccination is recommended for anyone aged 15 years and over who work in at risk occupations or at risk of exposure to Q fever.

As part of the vaccination process, pre-screening tests are required first to identify who can be vaccinated (consultation with the doctor, a blood test and skin test to check for immunity).

Vaccination should not be given if you have already had Q fever (due to possible serious reaction to the vaccine), to pregnant women, children under 15 years of age, anyone with an egg protein allergy or weakened immune system.

Minor skin reactions are common three to four days after the skin test, however, these reactions usually go away in seven days, which is when the skin test is read by the doctor.

After seven days, if a negative result is achieved for both blood and skin tests, it is safe to have the vaccine. Allow 15 days after the vaccination before starting work at a high animal risk environment.

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Further Queensland Museum resources

QM Health and Safety Resources

- Q fever - Discover more
- The Tick and Q fever
- Q fever - factsheet

QM Loans

- Queensland Museum Loans Q fever Toolkit (available for loan to Queensland schools and the community)

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