

Q Fever - Diagnostics

A diagnosis of Q Fever can be a challenge for several reasons including:

- ▶ Infected animals can be asymptomatic but still be shedding the bacteria
- ▶ Animals can shed from differing routes and the amount of shedding can vary significantly over time
- ▶ In cattle the presentation is often subclinical and can be confused/diluted by other factors

When to consider Q Fever:

In cattle herds:

- ▶ Increased abortion or reabsorption, still births or weak calves
- ▶ Increased retained foetal membranes (RFM)
- ▶ Increased metritis/endometritis
- ▶ Fertility issues:
 - ▶ Extended calving to conception intervals
 - ▶ Increased returns to service
 - ▶ Poor pregnancy rate

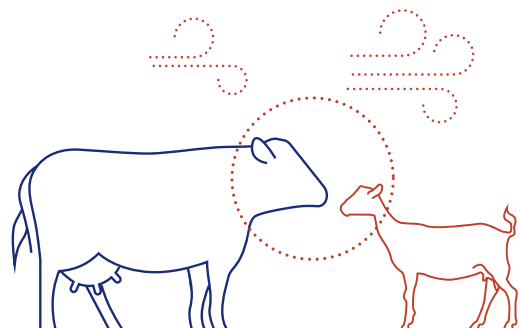
It is important that other (more common) possible causes of the issue are investigated and ruled in or out for example:

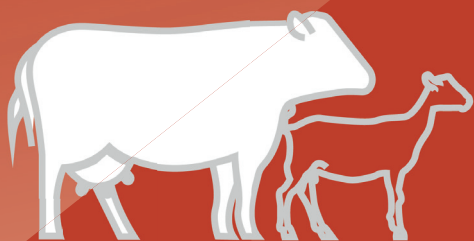
Nutritional issues and other infectious diseases such as BVD, IBR or Leptospirosis.

In small ruminants:

- ▶ Increased abortion/abortion storms, still births or weak newborns
- ▶ Increased RFM
- ▶ Milk drop

Rule out other infectious or management causes of losses.





Q Fever - Diagnostics

What tests can be run?

PCR:

This can be run on a variety of biological (e.g bulk milk or cervical fluid) and environmental samples to demonstrate presence of the bacteria. Due to its zoonotic nature fresh samples can be a risk to the laboratory staff.

► Q Test - BTM

Recent work has validated the Q Test for use on bulk milk samples from dairy cow and goat herds¹.

The Q Test uses a FTA card which uses cellulose paper with lyophilized chemicals to capture and bind DNA from the samples.

The DNA is then extracted, before amplification for a real time PCR which is fast, sensitive and semi – quantitative.

DNA is stable for up to 28 days on the FTA cards and detection was higher using FTA cards (91.4%) than raw milk (77.6%)¹.

Please contact your Ceva territory manager to request subsidised Q Tests.

► Abortive Materials

PCR on a minimum of 2 abortive samples. Please do not use wooden handled swabs, use plastic type.

APHA will test samples of fresh placenta (with cotyledon) from ruminants where there is a suspicion of Q fever. APHA recommend sending a sample of fresh placenta (with cotyledon) from the affected cow or small ruminant. APHA can also test foetal fluid, however placenta is the preferred sample.

► Vaginal Swabs

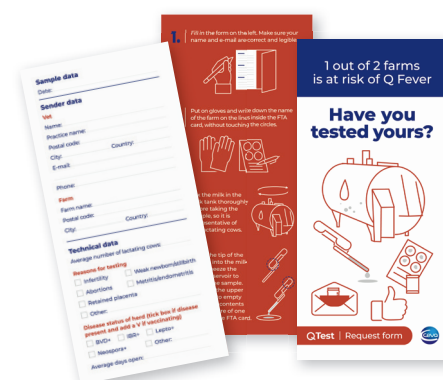
APHA run the PCR on other samples including swabs (as non-validated), however it is advisable to discuss with the APHA Penrith PCR department prior to sending.

Serology:

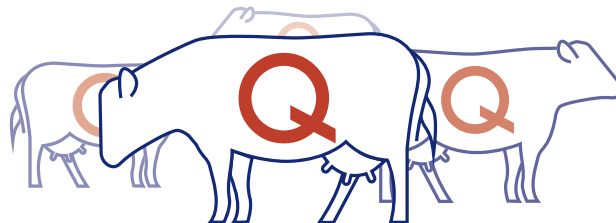
ELISAs are available to measure antibody levels which can be useful as an indicator of exposure to the bacteria in unvaccinated animals.

The ELISA is reported to be 82.6% sensitive in cattle so false negatives can occur⁽²⁾. Seroconversion does not always occur in cows that are shedding bacteria^(3,4).

BTM serology is available from some of the UK private laboratories as an additional screening of antibodies.



Field situations - Cattle



.....Cattle Herds

For herds experiencing infertility, abortions or reabsorptions, and/or increased incidence of RFM/endometritis.



Bulk milk PCR (Q Test)

- ▶ Test at anytime however a positive diagnosis is most likely when there is an introduction of fresh calved cows milk into the bulk tank.

The following diagnostic options may also be useful depending on each individual case. Please discuss with your Ceva tech vet for advice.

PCR on abortive samples

- ▶ On **minimum 2 aborted dams** PCR on placenta or on the aborted foetus (stomach contents)
- ▶ **Sampling must be fresh**, immediately following the abortion
- ▶ Samples should be refrigerated and sent to the lab **as soon as possible**

Serology

- ▶ **Blood sampling** - select cows with clear recent history of reproductive issues (RFM, metritis and stillbirth, for example)
- ▶ **BTM sampling** is an option to screen for circulating antibodies



BTM PCR negative - Q Fever may not to be involved, retest BTM in 3 months.



Look for other cause & retest BTM 3 months

PCR abortive sample negative - Q Fever may not to be involved in specific case/s.



Look for other cause & consider BTM PCR

BTM PCR positive - *Coxiella burnetii* likely to be circulating in herd and Q Fever may well be involved.



Consider putting Q Fever control plan in place & vaccinate herd

PCR abortive sample positive - Q Fever may be involved in abortion and *Coxiella burnetii* likely to be circulating in the herd.



Consider putting Q Fever control plan in place & vaccinate herd

Ceva supports subsidised diagnostics for Q fever, please speak to your Ceva technical vet to access support.

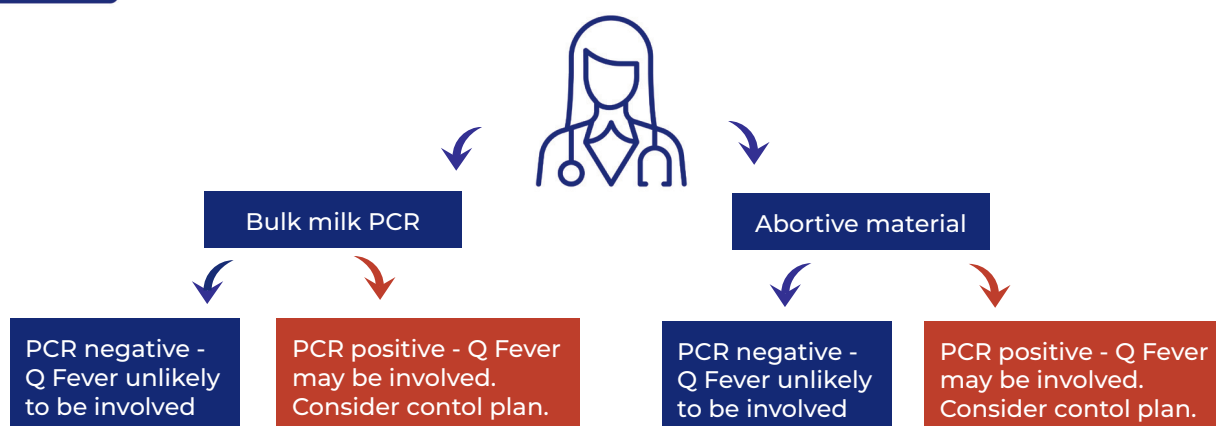
Field situations - Small Ruminants

.....Small Ruminants

Increased abortions/abortion storms



Bulk milk (Q Test) - validated for goats milk
PCR of abortive materials (APHA)



Vaccination

- **COXEVAC®** is a phase one inactivated vaccine against *Coxiella burnetii*. Dose is 2 ml for goats and 4 ml for cattle given under the skin. The primary course is 2 injections given 3 weeks apart. A vaccine protocol needs to be implemented over at least 3 years to maximally reduce shedding and therefore environmental contamination and disease. Ideally primary vaccination should be completed before first service.



For further information:
contact your Ceva technical vet or territory manager, visit
www.qfever.co.uk or email cevak@ceva.com

Q Fever

References: 1. Treilles M. *et al.* 2021. QTest: A new way to easily sample, store, and ship samples to perform Q Fever PCR analysis on bulk tank milk. JDS Communications 2:6 (2021): 409-414. 2. Biobest Laboratories Ltd, 2023: *Coxiella burnetii* serology diagnostic reports 3. Guatteo R *et al.* 2007 Assessing the Within-herd Prevalence of *Coxiella burnetii* Milk-shedder Cows using a Real-time PCR Applied to Bulk Tank Milk. 4. Guatteo R *et al.* 2012. Shedding and serological patterns of dairy cows following abortions associated with *Coxiella burnetii* DNA detection.

COXEVAC® suspension for injection for cattle and goats contains inactivated *Coxiella burnetii*, strain Nine Mile ≥ 72 QF Unit/ml. *Q-fever Unit: relative potency of phase 1 antigen measured by ELISA in comparison with a reference item. **Legal Category:** UK [POM-V] IE [POM] Further information is available from the product SPC, data sheet or pack insert. Prescription decisions are for the person issuing the prescription alone. Use medicines responsibly (www.noah.co.uk/responsible)

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