

When to suspect Q Fever/coxiellosis on a dairy cattle herd?

You've probably heard of Q Fever before, because it is a major cause of abortion in ruminants, and/or because it can be transmitted to humans (zoonosis). The largest European outbreak to date occurred in the Netherlands in 2007–2009, where infection of milking goats was linked to almost 3,500 human cases over these three years.

Q Fever is a disease caused by a bacterium, *Coxiella burnetii*. Most infections in a herd typically don't show outward signs (subclinical) and are of longstanding subacute or chronic nature. However, new (acute) infections can occur as new heifers calve into a herd or purchased animals enter. A proportion of infected animals can develop detectable (acute or chronic) clinical signs from their longstanding latent infection, causing reproductive disorders.

At herd level, infection by *C. burnetii* (coxiellosis) is therefore often not recognized, unless aborted fetuses and stillborn calves are all investigated thoroughly. In France, a seroprevalence study showed that 65% of



dairy cattle herds (and 20% of beef herds) are exposed to *C. burnetii* ^[1], which was not expected by farmers nor veterinarians. Most studies all over the world tend to find comparable results: at global level 44% of investigated cattle herds have been found exposed to *C. burnetii*. Whenever it has been explored, the proportion of exposed herds is significantly higher in dairy than in beef cattle herds (49.0% vs. 14.5%, respectively) ^[2].



ABOUT THE PATHOGEN

Coxiella burnetii is an intracellular bacterium, which means it is able to evade the immune system during infection. In the environment, it is able to resist durably desiccation (for several months), disinfection (such as 0.5% sodium hypochlorite) or UV radiation. It can survive several days in moisture (at least 7 days in water or milk at room temperature), but is inactivated by pasteurisation. All mammal species can be infected by *C. burnetii*, although ruminant species (including wildlife) are considered its main reservoir. People professionally exposed to cattle or small ruminants (veterinarians, farmers, slaughterhouse personnel...) are at risk of infection.



PURPOSE OF THIS FACTSHEET

To present the clinical signs that may be associated with the infection of dairy cattle with *Coxiella burnetii*, the causative agent of Q Fever.



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"In contrast to sheep and goats coxiellosis in cattle herds does not necessarily result in multiple abortions. Weak newborn calves, an increased number of cows with retained placenta and endometritis and decreased fertility are clinical signs which are associated with coxiellosis. Since these signs are rather unspecific, farmers should ask their herd veterinarians for further diagnostic measures."



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"Herd fertility problems are complex and multifactorial in both dairy and beef farms. Too often the cause of abortions and poor reproductive performance remain unknown and this prevents effective control. Fertility problems are different on each individual herd. It is therefore important that investigation with the herd veterinarian takes place when poor performance occurs – for the economics of the herd, the welfare of animals and also the health of farmers themselves, as some infectious causes of infertility are a human health risk. Coxiellosis causing Q Fever should be considered whenever abortion occurs, but remembering that this includes pregnancy loss at all stages of pregnancy and in particular animals diagnosed pregnant that later return to heat. But furthermore, a range of problems from stillbirths to retained fetal membranes, endometritis and infertility measured as delayed calving-conception are all potential warning signs of Q Fever that should be investigated further."



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"In my experience with implementation of vaccination on large dairy herds, in addition to causing reproductive problems, coxiellosis is a factor that, through its immunosuppressive effects, can be suspected in certain cases of mastitis and respiratory problems. This is particularly important during the transition period when cows with different immune statuses are often brought together. This means that economic losses estimated during Coxiella burnetii outbreaks that only take into account reproductive losses are often underestimated."

1. ARE ABORTIONS SUGGESTIVE OF COXIELLOSIS?

The short answer is: yes, they are suggestive of *C. burnetii* infection. Abortion is the most obvious clinical sign of *coxiellosis* in cattle. However, important points to keep in mind are that there are a range of clinical signs suggestive of *coxiellosis* that are not limited to just abortions, and that there are several possible infectious causes for abortion: testing is paramount. Due to the contagious capacity of *C. burnetii*, it is rare that a single animal in a herd is infected: most frequently, *coxiellosis* causes series/repeated abortions. So, in France, further to the implementation of an Observatory of Causes of Abortion in Ruminants (OSCAR) in 16 departments, thresholds for triggering investigation in case of a series of abortions have been defined. *Coxiellosis* (Q Fever) should be suspected (and investigated) in case of repeated abortions:

- Closely spaced abortions: 2 or more abortions in 30 days or less,
- Spaced abortions: 3 or more abortions in 9 months, regardless of herd size.

Contact your veterinarian in such cases!

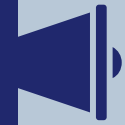


DID YOU KNOW? In the EU27, Q Fever (or *coxiellosis*) is covered by the Animal Health Law, where it is included in category E (only surveillance and reporting are mandatory) since 2021. Management of the disease is left to the decision of local (regional or national) authorities. The official decisions upon the detection of *C. burnetii* in a herd may vary depending on the location of the herd.

2. HOW FREQUENT IS COXIELLA BURNETII FOUND AS THE CAUSE OF ABORTIONS?

The importance of *C. burnetii* is far from negligible. There is probably a different figure in each country, especially for those where brucellosis is still prevalent, but wherever it has been investigated, *C. burnetii* is found among the main causes of abortion.

- In France, the OSCAR observatory found *C. burnetii* to be a significant cause of abortion (10%, vs 14% for Neospora) ^[3].
- In Belgium ^[4], a one-year observational study found that it was the cause of 8.5% of all abortions.
- In Italy ^[5], a prospective study found 12% of bovine abortions to be caused by *C. burnetii*.



DID YOU KNOW? Although the notification of abortions is mandatory due to the bovine brucellosis regulation, such events are known to be highly under-reported: in France, it is estimated that only 34% of abortions are notified ^[6], and 46% in Belgium ^[4]. Cows that return to heat after being confirmed pregnant have suffered pregnancy loss and this is an important and often unrecorded form of abortion. This is probably part of the reasons why the importance of *C. burnetii* in abortions has long been neglected.

3. WHAT ARE THE SIGNS THAT SHOULD RAISE SUSPICION?

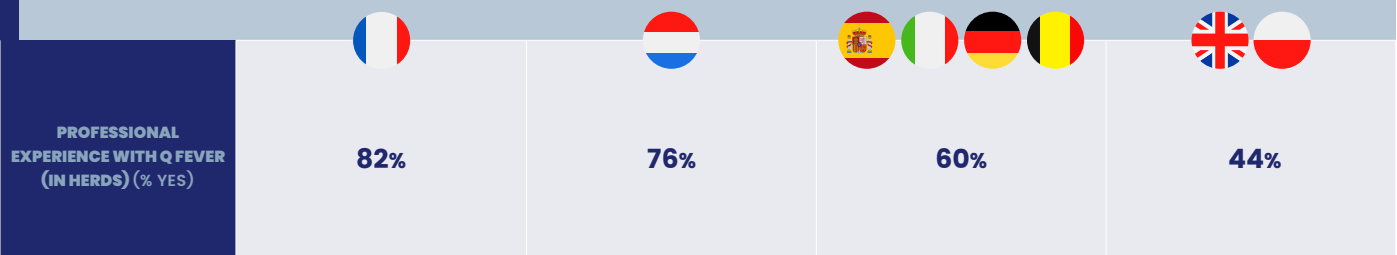
There are five main answers to this question.

- 1. Abortion/pregnancy loss:** the loss of pregnancy caused by uterine infection with *C. burnetii* can occur at any stage of pregnancy, not only near to the expected calving date. It can result in the expulsion of a fetus, but also in the return to estrus of cows that were previously diagnosed as pregnant.
- 2. Stillbirth, premature calving, and calves weak at birth** ^[7] are also associated with *C. burnetii* infection.
- 3. Retained placenta:** retention of the afterbirth for more than 48 hours after calving is also a clinical manifestation of *coxiellosis* ^[8]. Of course, a retained placenta may be the consequence of abortion, but also exists in infected cows that gave birth to a normal (healthy) calf, as a consequence of the presence of *C. burnetii* in the genital tract.
- 4. Endometritis,** in particular those cases unresponsive to conventional treatment.
- 5. Infertility:** (reproductive) infection by *C. burnetii* can cause a drop in fertility (decrease in the AI success rate), and sometimes this is the main sign of a problem in a herd.

Please contact your veterinarian for any further information.



DID YOU KNOW? In France ^[9], 40% of veterinarians say they suspect *Coxiella burnetii* on farms at least once a year in their practice and 82% mention having professional experience with the disease. In Spain, Italy, Germany and Belgium, 60% of large animal practitioners have had a professional experience with *coxiellosis*, while in the UK and Poland, that proportion was of 44% ^[10].



4. WHY IS IT IMPORTANT TO RAISE AWARENESS ON COXIELLOSIS AMONG RUMINANT FARMERS?

Humans and ruminants are receptive to *C. burnetii* infection; farmers, stockmen and veterinarians are among the most exposed professionals, **and infection may have significant adverse health consequences** among so called YOPIs: Young (children), Old (the elderly), Pregnant women and Immunocompromised individuals. However, these facts are not widely known among farmers in Europe ^[11], as shown in a recent survey in 8 European countries: approximately 75% of all farmers were either unaware of the disease or only familiar with its name in all countries. In Germany, Spain, Italy, Poland, the UK and Belgium, 89-95% of respondents do not vaccinate their herd against *C. burnetii*, a puzzling fact since those farmers were aware of the zoonotic aspect of the infection. As a consequence, raising awareness about this infection among farmers is of importance.

REFERENCES

1. Gache K. et al., 2017. *Epidemiol. Infect.*, 145(15):3131-3142. doi: 10.1017/S0950268817002308.
2. Konputtar A. et al., 2024. *Vet. World*, 17(12):2811-2828. doi: 10.14202/vet-world.2024.2811-2828.
3. [In French] *Animal Epidemiol. Platform*, 2022, 28 p. https://www.plat-forme-esa.fr/sites/default/files/2022-08/resultats_oscar_2021.pdf
4. Saegerman C. et al., 2022. *Pathogens*, 11, 429. <https://doi.org/10.3390/pathogens11040429>.
5. Parisi A. et al., 2006. *Vet. Microbiol.*, 118(1-2):101-6. doi: 10.1016/j.vet-mic.2006.06.023.
6. Bronner A. et al., 2013. *PLoS ONE*, 8, e63246. doi: 10.1371/journal.pone.0063246.
7. Cabell E., 2007. *In Practice*, 29, 455-463.
8. Gisbert P. et al., 2024. *Animals (Basel)*, 14(9):1313. doi: 10.3390/ani14091313.
9. [In French] *Viavoice 2020 Study*, 5 p. <https://www.comitefevreq.com/content/download/1659/23748?version=1>
10. Guatteo R. et al., 2024. *IJID One Health*, 2025. Accepted.
11. Guatteo R. et al., 2025, *European Buiatrics Congress. Q Fever awareness among European ruminant farmers.* <https://hal.inrae.fr/hal-05086440>



EUROPEAN Q FEVER COMMITTEE

The Q FEVER COMMITTEE, co-chaired by Professors Raphaël Guatteo and George Valiakos, was created in July 2024 with the support of Ceva Santé Animale.

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