CONSULTATIVE SIGNAL ASSESSMENT

INCREASE OF *COXIELLA BURNETII* IN ANIMALS

Date of the signal	Date of the CSA	Signal provider	Experts consultation	Method
25/03/2024	**04/04/2024**	FAVV-AFSCA	**Permanent experts** AVIQ : Alessandro Pellegrino Departement Zorg : Naïma Hammami Vivalis : Maureen Mooken RAG : Jorgen Stassijns **FAVV-AFSCA** Jef Hooyberghs, Philippe Houdart, Ingeborg Mertens, Chantal Rettigner **RAG-V-EZ** Axel Mauroy (FAVV-AFSCA) **NRC** Marcella Mori (Sciensano), Dorien Van den Bossche (ITM), Marjan Van Esbroeck (ITM) **Sciensano EID** Tinne Lernout, Amber Litzroth, Joris Van Loenhout	**Meeting 04/04/24**
Date of update	**Closing date**			

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SIGNAL	Increase in detection of *Coxiella burnetii* in abortion material of sheep and goats since the beginning of 2024, reported by FAVV-AFSCA on March 25.

DESCRIPTION

Event	Within the routine testing of abortion material from sheep and goats for *Coxiella burnetii*, about 30% of the 248 samples tested between 01/01 and 20/03/2024 were positive, compared to 15% of 169 samples tested in the same period of 2023. Infections in 2024 were identified throughout the country (see map in Annex 1). Up to now, no increase has been observed in bulk tank milk samples, nor in humans.

PREPAREDNESS & CONTROL MEASURES ALREADY IN PLACE

Surveillance in animals

Surveillance program coordinated by AFSCA-FAVV since 2009, based on 1) the follow-up of the seroprevalence and shedding of *C. burnetii* in dairy sheep flocks and goat herds through sampling of bulk tank milk 5x/year for all holdings that deliver milk for human consumption to the food chain, either via dairy companies or through on farm sales (BTM surveillance)[1] and 2) mandatory declaration of abortions and testing for herds of goats and sheep.

Surveillance in humans

Mandatory notification in Flanders (notification of probable and confirmed acute Q-fever), Wallonia (notification of confirmed Q-fever) and in Brussels (Q-fever not specified). Investigation of the source of infection (through questioning the patient) is done for all notified cases in the three regions, but for most cases, the source cannot be identified.
Surveillance is also carried out by the NRC, which is a useful complementary source of information, since about half of the cases confirmed by the NRC are not reported to the regions.

Measures

In 2011, the HGR-CSS (with input of the RAG) and AFSCA-FAVV published guidelines on the prevention and control of Q-fever in humans and animals in Belgium[2,3].
Positive results in animals are reported by AFSCA-FAVV to the regional health authorities. In Flanders, in case of a positive goat or sheep farm with more than 50 animals in the holding, Departement Zorg sends a letter to the GPs within the 5 kilometre around the farm (through de Huisartsenkring-area defined following experience from the Q fever outbreak in the Netherlands). In practice, the number of alerts followed by a communication is small, since most goat and sheep farms

[1] Jansen W et al. Belgian bulk tank milk surveillance program reveals the impact of a continuous vaccination protocol for small ruminants against Coxiella burnetii. Transbound Emerg Dis. 2022 Jul;69(4):e141-e152. doi: 10.1111/tbed.14273.
[2] HGR-CSS. Publicatie nr 8633. Aanbevelingen betreffende de preventie en bestrijding van Q-koorts in België. Januari 2011. https://www.health.belgium.be/nl/advies-8633-q-koorts
[3] AFSCA-FAVV. Recommandations relatives à la fièvre Q chez les petits ruminants en Belgique (dossier Sci Com 2009/37) https://favv-afsca.be/sites/default/files/2023-12/FR_conseil_Qfever.pdf

in Belgium are small (< 50 animals). In April 2024, three alerts were sent. In Wallonia, following a notification by AFSCA, no letter is sent to the GPs. In Brussels, there is no specific protocol in place, but there are no (or seldom) positive notifications in animals (no farms).
Vaccination of animals is compulsory within 6 months for positive goat holdings, but not in case of a Q-fever infection reported in sheep farms. The raw milk or raw milk products from the species responsible for the non-compliant sample of tank milk must be treated (by high temperature), until a new sample of bulk tank milk can no longer detect the presence of *C. burnetii* or until all animals have been vaccinated.

PUBLIC HEALTH IMPACT

Currently, there is no increase in the number of human cases of Q-fever, but there might be a delay in both reporting and diagnosis, or underdiagnosis (high proportion of asymptomatic infections). If an impact would occur, it would be mainly in persons with an occupational risk (farm keepers and their staff, shepherds, veterinarians, slaughterers, …) and in inhabitants around positive farms.

Of note, Eid al-Adha starts mid-June, and might represent an increased risk for slaughterers.

RISK ASSESSMENT

Since the start of the monitoring, the proportion of positive results for *C. burnetii* in abortion material of sheep and goats has been fluctuating over the years, between 0,0% in 2015 up to 18,3% in 2017 for sheep and 0,0% in 2015 to 17,6% in 2019 for goats (but smaller number of samples tested). However, it is the first time that a prevalence of 30% has been registered.

Several factors might contribute to this observed increase of *C. burnetii* infections in sheep (and to a lesser extent in goats).

Firstly, the National Reference Laboratory uses another automate platform for Nucleic Acid extraction, of slightly higher quality. This automate is in use since mid-2023, whereas the increase is observed starting from the beginning of 2024 only. But since the lambing season in our region is mainly situated in the months of February to May, the risk of abortion is low in summer and autumn, and an impact due to changing the analysis methodology after the end of the lambing season would therefore probably not be picked up until the following lambing season, thus the previous months.

Secondly, some farms are close to each other (see map), possibly infecting each other through spread of Coxiella by wind. However, positive farms are spread all over the country, and the number of possible clusters is small.

Thirdly, the number of abortion material sent for testing increased during 2023 and 2024, probably in the context of the bluetongue alert in Belgium and the increased financing of brucellosis measures (including testing of abortions). Although the observed increase is not only absolute numbers, but a proportion rate (increase from 15% positive samples to 30%), there are now proportionally more samples of sheep (sheep were not well represented in the samples before 2023), so we might detect infections now that were previously undetected (because no testing).

The absence of an increase of positive samples of tank milk might be due to the fact that in Belgium, most sheep are bred for meat production and only a small proportion are dairy sheep, so sheep are not well represented in the BTM surveillance in Belgium. Since the majority of goats are dairy goats, they are well covered by this surveillance. Moreover, a good proportion of the goats on these milk

producing farms are vaccinated against *C. burnetii*, as this vaccination is mandatory for farms that have shown a positive analysis result in the BTM and farms that deliver the milk to a dairy plant in The Netherlands (where vaccination has been made mandatory several years ago). Therefore, the impact of sheep on the Q fever epidemiology based on the BTM surveillance might be severely underestimated[4].

RECOMMENDATIONS

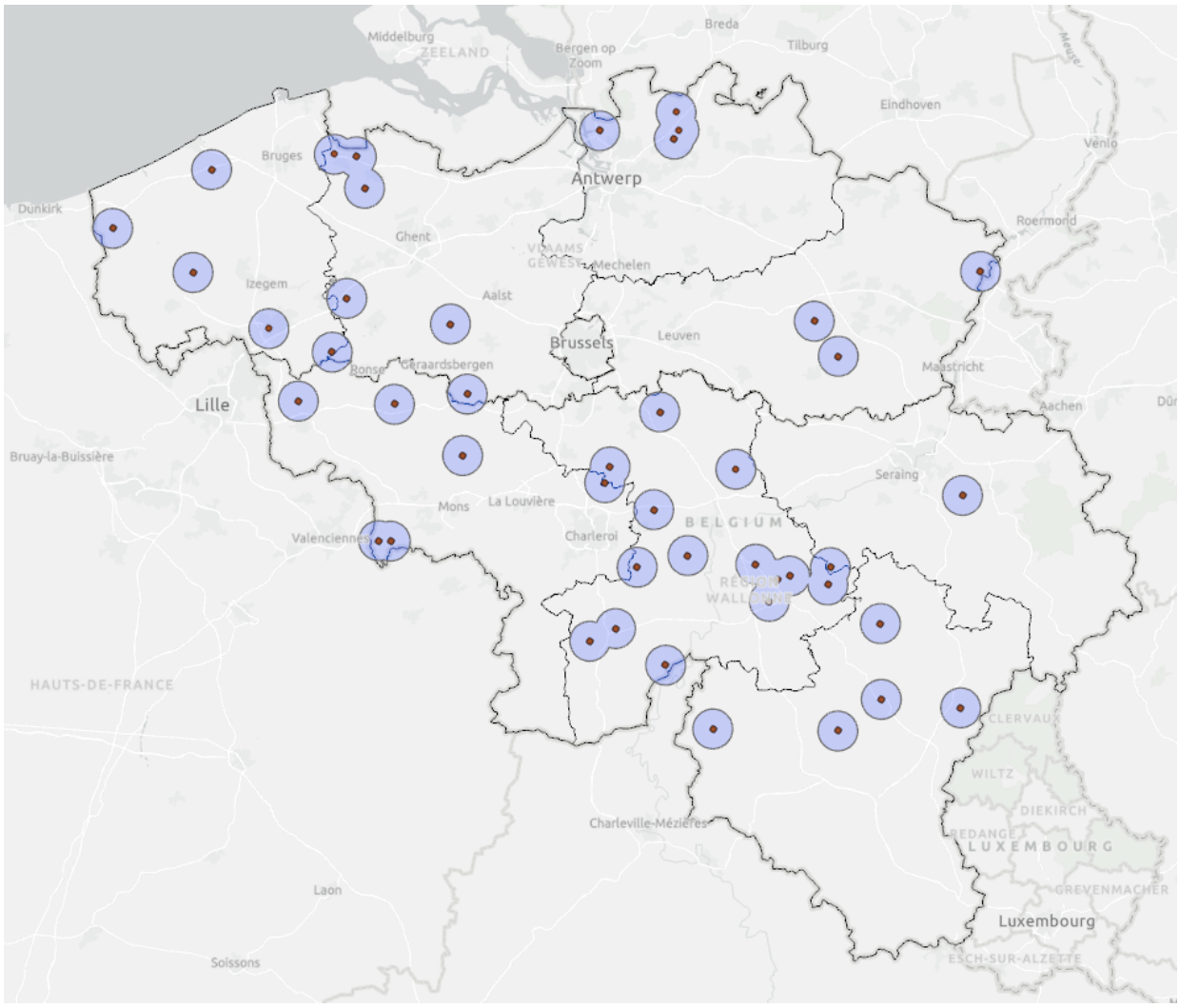
- Collect more information on the characteristics of the positive farms (size, contact with public, etc) → AFSCA-FAVV
- Consider communication on the increase to persons at risk, such as sheep and goats shepherds, veterinarians, slaughterers and consumers of non-pasteurised dairy products from small ruminants → AFSCA-FAVV
- Information to health care workers through the monthly newsletter Flash, planned beginning of May → Sciensano, DZ, AVIQ, Vivalis
- Epidemiological follow-up in humans → DZ, AVIQ, Vivalis, DG, Sciensano

[4] Jansen W et al. Belgian bulk tank milk surveillance program reveals the impact of a continuous vaccination protocol for small ruminants against *Coxiella burnetii*. Transbound Emerg Dis. 2022 Jul;69(4):e141-e152. doi: 10.1111/tbed.14273.

ANNEXES

Annex 1: Epidemiological data animals

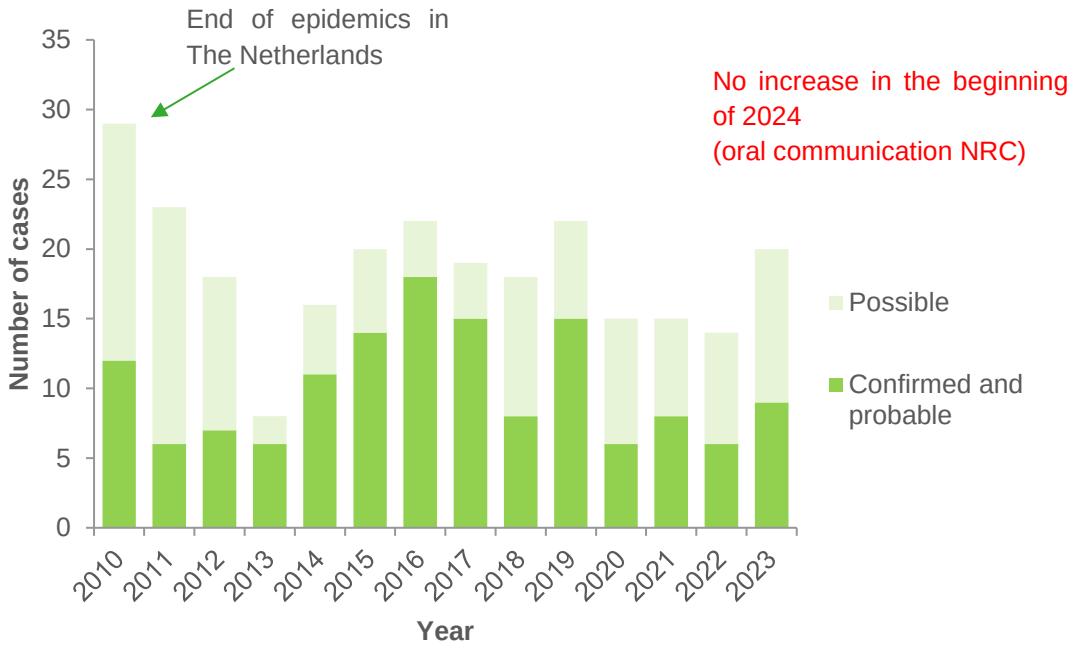
Geographical spread of farms with abortion material positive for *C. burnetii*, 01/01-20/03/2024 (Source AFSCA-FAVV)



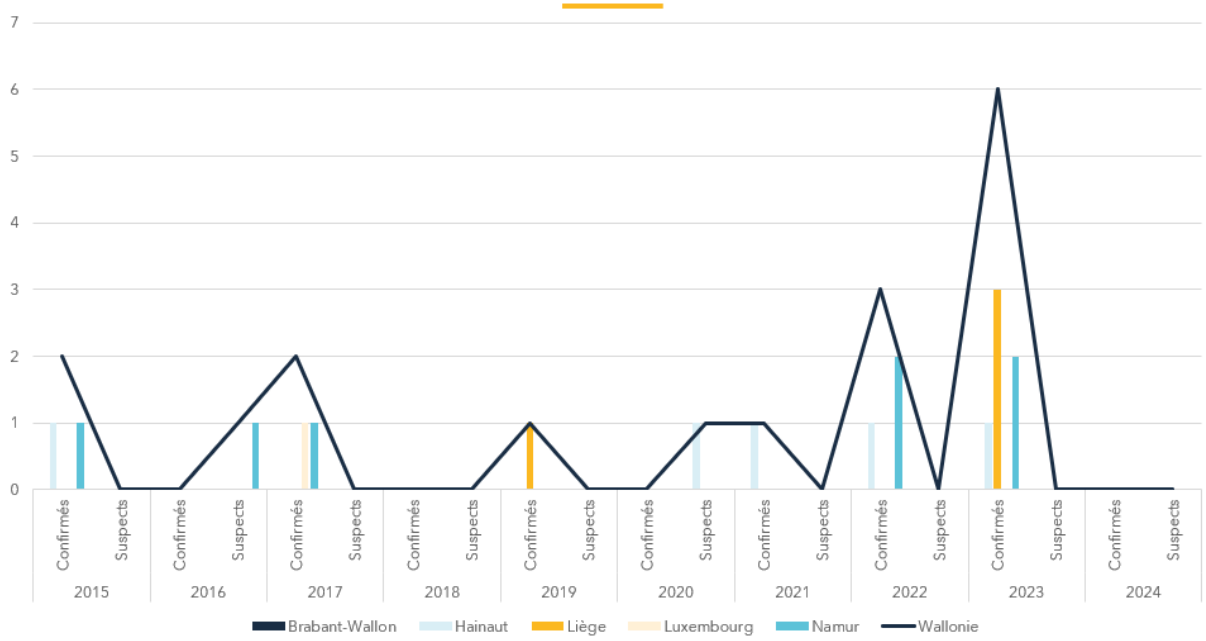
* The blue area around represents a circle of 5km around the infected farm

Annex 2: Epidemiological data humans

Number of reported Q-fever case by case classification and year, Belgium, 2010-2023 (Source NRC)



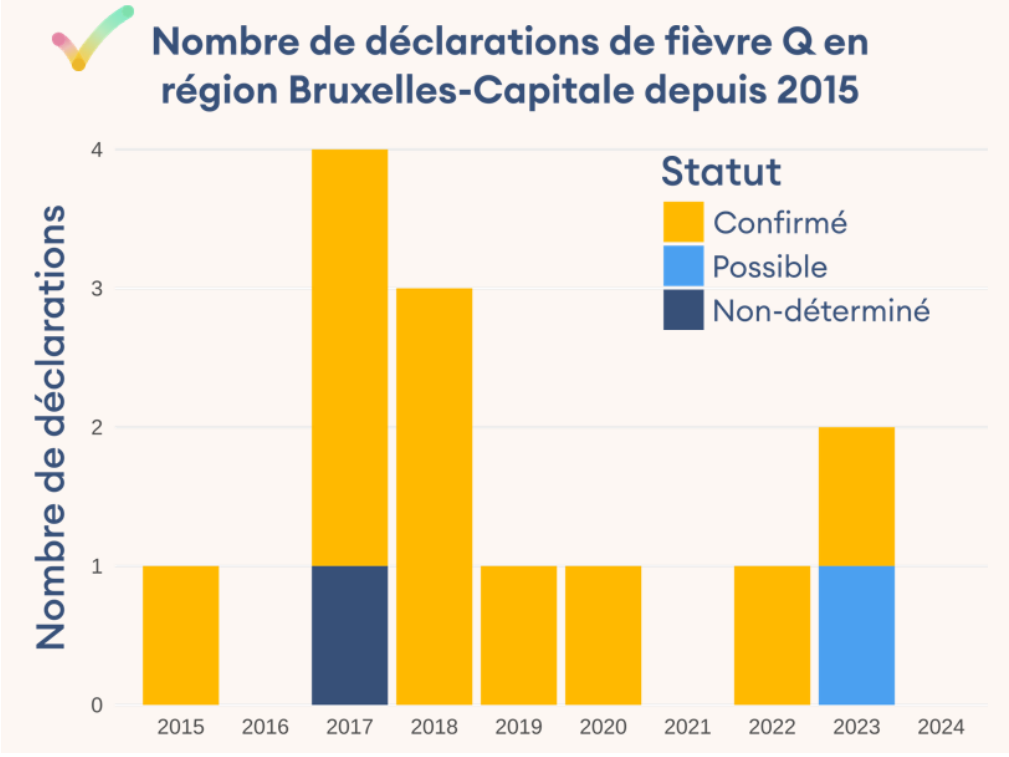
Number of confirmed cases of Q-fever notified to AVIQ, 2015-2024



2023: 6 cases, of which 2 were likely imported

Number of confirmed cases of Q-fever notified to DZ by month, 2017-2024

Number of confirmed cases of Q-fever notified to Vivalis, 2015-2024



2023: 2 cases, both imported