Department for Environment, Food and Rural Affairs

Preliminary Outbreak Assessment

Foot and Mouth Disease SAT1 in Iraq, Bahrain and Kuwait

6 May 2025

Disease report

Foot and mouth disease (FMD) cases caused by serotype SAT 1 have been reported recently in 3 countries in the Middle East. Reports to the Food and Agriculture Organization of the United Nations (FAO) and World Organisation for Animal Health (WOAH) have involved clinical cases in a quarantine station in Bahrain and more extensive field cases in at least 7 governorates in Iraq since January 2025. More recently, 9 outbreaks in cattle have been reported in Kuwait to WOAH (WAHIS). More recently, 9 outbreaks in cattle have been reported in Kuwait to WOAH (WAHIS). Testing of samples received to the WRLFMD (Pirbright Institute) from Bahrain and Iraq has confirmed the presence of FMD virus, serotype SAT1. Genome sequencing characterises these viruses as members of the SAT1/I topotype most closely related to FMD viruses that circulate in East Africa.

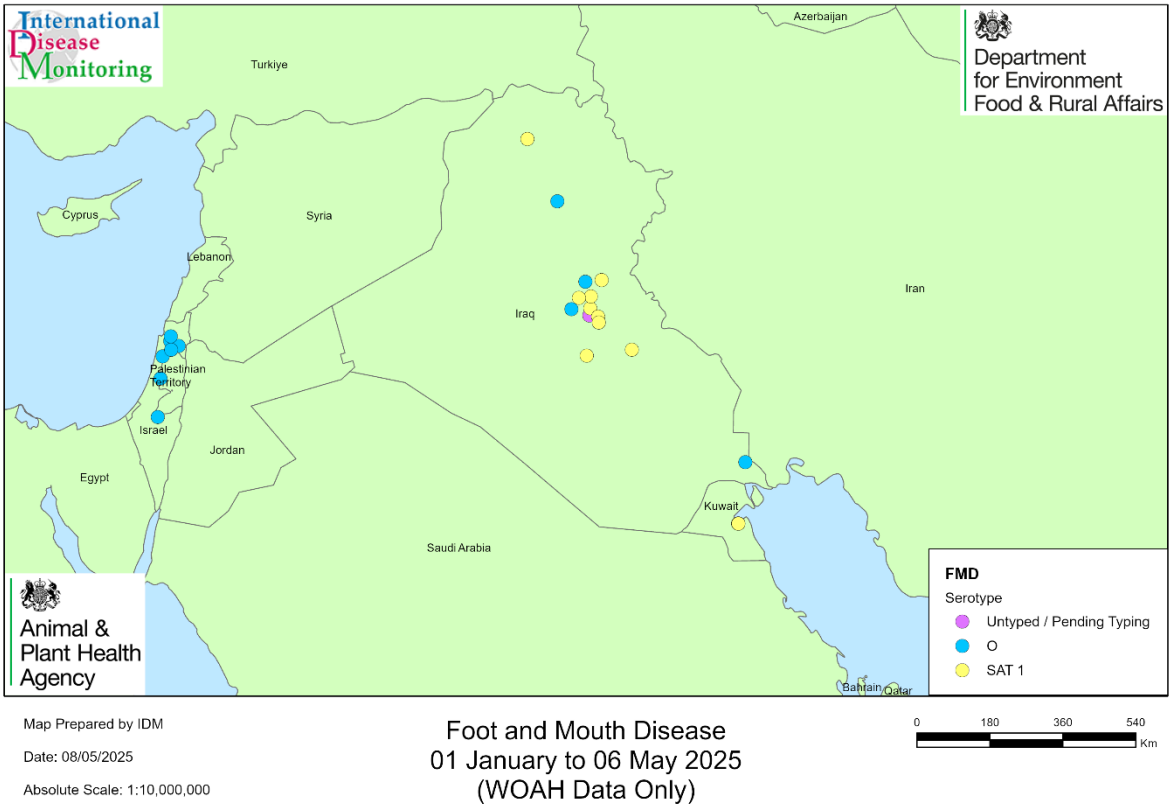

Figure 1: Map showing outbreaks of FMD in the Middle East from 1 January 2025 to

6 May 2025 reported to WOAH. The map shows a single point in Kuwait for SAT1, several SAT1 points in Iraq together with some FMDV-O points and several FMDV-O points in Israel. These are discussed in full in the text.

Situation assessment

The global distribution of FMDV can be divided into 7 endemic pools (Figure 2) which represent regions where specific FMDV lineages are maintained. There are 7 FMDV serotypes (A, O, C, SAT1, SAT2, SAT3 and Asia1). FMDV epidemiology is documented by dynamic cross-exchange and long-distance movements of viruses between the 7 endemic pools (Di Nardo et al., 2023). Immunity from infection or vaccination is serotype-specific and will not provide protection against the other serotypes.

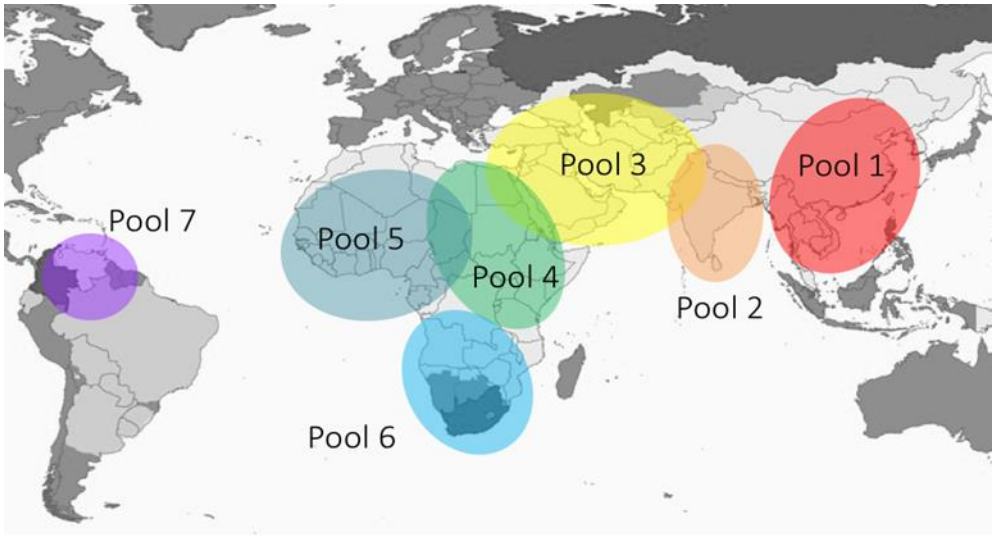

Figure 2: Map showing WOAH FMD status and endemic pools of FMD where virus lineages are maintained and circulate independently. The 7 pools are as follows: Pool 1 in south-east Asia, Pool 2 in India, Pool 3 in the Middle East, Pool 4 in north-eastern Africa, Pool 5 in west Africa, Pool 6 in southern Africa, and Pool 7 in north-east South America.

FMD has been a long-standing challenge in the Near East and West Eurasia, with multiple serotypes circulating in different countries – primarily serotypes O, A, and Asia 1, and more recently SAT2 (FAO, 2025). Countries in these regions face recurrent FMD outbreaks, often linked to transboundary animal movements, informal livestock trade, and inadequate vaccination coverage. There were incursions of serotype SAT2 in 2022 to 2023 affecting Bahrain, Jordan, Iraq, Oman and Türkiye linked to viruses usually detected in East Africa (FAO, 2025, Di Nardo et al, 2005).

SAT1 circulation is usually limited to sub-Saharan Africa, with the recently detected lineage in Bahrain and Iraq being most closely related to viruses isolated from eastern Africa (Tanzania) over 5 years ago. In 2023, there were cases due to SAT1 in Qatar, but these viruses had a separate origin in East Africa to the cases that have occurred in 2025. Historically, SAT1 has been detected sporadically in the Near East and West Eurasia. The last reports of widespread circulation of serotype SAT1 in the region were in 1962, with SAT1 outbreaks being reported that year in Bahrain, the

Islamic Republic of Iran, Iraq, Israel, Jordan, Lebanon, the Syrian Arab Republic, and Türkiye (Di Nardo et al., 2023). SAT1 was detected on 2 further occasions: an unknown genotype in Kuwait (1969-1970) and Saudi Arabia (1970) and topotype VI in Yemen in 1984 (Di Nardo et al., 2023). Sequence data for the recent cases in Bahrain and Iraq support another FMD viral incursion into the region, highlighting the ongoing and regular threat of non-endemic serotypes and lineages to the region and the need for heightened surveillance and targeted control measures.

Incursions of exotic FMDVs into new areas, and especially from eastern Africa, have been associated with trade in livestock or products of animal origins (Di Nardo et al., 2023). A risk assessment by FAO (2023) identified likely pathways of SAT2/XIV diffusion within western Asia and pointed to the risk posed by informal livestock trade routes and common grazing. Islamic festivals, such as Eid al-Adha, increase demand for meat across the region driving differential pricing, which could also potentially affect the epidemiology of FMD. In the case of SAT2/XIV, its origin in the 10 years before its reappearance in 2022 in eastern Africa may have been a wildlife reservoir such as Cape buffalo (Di Nardo et al., 2023).

Iraq

In total 9 outbreaks of FMDV SAT1 have been reported in Iraq, the first being detected on 15 January 2025. In an initial report on WOAH on 5 May 2025 (WAHIS), 2 outbreaks of FMDV-SAT1 were reported representing a new strain of FMDV in Iraq. There were 6 cases in 35 cattle in Al Miqdadiyah, Diyala on 9 March and 3 cases in 60 domestic buffaloes in Adhamiya, Baghdad on 9 February. In a follow up report on WOAH on 5 May 2025 (WAHIS), 7 further outbreaks of FMDV SAT1 were reported representing a new strain in a zone or a compartment in Iraq. There was 1 case in 200 cattle in Baland Ruz, Diyala on 15 January, 150 cases in 500 cattle in Al Mahawii, Babil, on 16 February, 70 cases in 100 cattle in As Suwayrah, Wasit on 19 February, 1 case in 199 cattle in Balad Ruz, Diyala on 6 February, 75 cases in 130 cattle in Al-Faris, Sala ad-Din on 24 February, 35 cases in 170 domestic buffaloes in Ba'qubah, Diyala on 19 February, and 11 cases in 50 cattle in Mosul, Ninawa on 17 February.

On 5 May 2025, 5 new outbreaks of FMDV O were reported on WOAH (WAHIS). The event started on 15 January until 6 February. These outbreaks were caused by a new FMD vial lineage (O/ME-SA/SA-2018) with an origin in South Asia that is emerging in the region (see below).

The source of infection is considered to be airborne spread or contact with infected animals at grazing or watering points. Although there is vaccination in Iraq for FMDV-O some livestock owners refrained from vaccination according to epidemiology comments in the WAHIS report.

Bahrain

Clinical samples from cattle in January 2025 were received to the WRLFMD, Pirbright from a quarantine isolation station located in Buri, Northern province, Bahrain.

Kuwait

The first outbreak of FMDV-SAT1 in Kuwait was detected on 6 April 2025 on a farm in Al Jahrah with 2,775 cattle of which 1,161 were infected (WAHIS). Between the 11 April and 20 April, a further 8 outbreaks were detected in cattle in farms in Al Jahrah. The 9 outbreaks of FMDV-SAT1 are very close to each other and show as a single point on the map (Figure 1). Media articles report 1,400 cattle affected in 10 farms in Kuwait (Outbreak of Foot-and-Mouth Disease Affects 1,400 Cattle on 10 Kuwait Farms | arabtimes). There are only 44 cattle farms in Kuwait and the total cattle population is just 23,000.

Work of the WOAH, FAO FMD Reference Laboratory Network (www.foot-and-mouth.org) has highlighted the threats to these regions posed by FMD virus strains that circulate in East Africa and South Asia. In addition to the serotype SAT1 FMD viruses detected in Bahrain, one of the samples in the batch showed evidence for the presence of a serotype O virus (from the O/EA-2 topotype that originates in East Africa). Following the multiple incursions of the SAT2/XIV topotype during 2022 to 2023 (Di Nardo et al., 2025), an emerging serotype viral lineage (O/ME-SA/SA-2018) has been detected in Iran, Iraq, Palestine, Türkiye and Israel. This virus lineage originates from South Asia where it has become more dominant to represent approximately 40-50% of the serotype O cases in India. The recent detection of these viruses in the Near East and West EurAsia demonstrates the active risk pathways into these regions from South Asia and East Africa.

Conclusion

The SAT1 serotype of FMDV has been reported in Iraq and Kuwait in January and April 2025, respectively. The FAO is recommending urgent biosecurity measures and enhanced surveillance following these detections of FMDV SAT1 in Iraq and Bahrain (FAO 2025). The SAT1 serotype is exotic to the Near East and West Eurasia regions, raising serious concerns about the potential spread of the virus. According to FAO (2025), until livestock populations are immunized with a suitable SAT1 vaccine, only rapid and effective biosecurity measures can limit the spread of the SAT1 virus.

While these detections of FMDV SAT1 represent a continual spread of new serotypes of FMDV to new regions within the Middle East, it presents a low risk to Great Britain. There is no trade to Great Britain in live animals or animal products from countries in the region. FMDV (serotype O) has been reported in Europe for the first time in several decades. These outbreaks in Europe present a higher immediate risk of entry of FMDV into Great Britain than the outbreaks described here in the Middle East. The risk that FMDV will enter Great Britain from Europe over the next 3 months (from 3 April 2025) has recently been assessed as **medium** (Foot and mouth disease in Hungary and Slovakia - GOV.UK). The highest risk routes of FMDV from Europe entering Great Britain are through commercial, personal or illegal trade of

products of animal origin (POAO). Each of these routes had a **medium** risk (meaning that the virus is expected to enter Great Britain 'regularly' over the next 3 months through each of the commercial, personal and illegal trade routes).

We consider at present there to be no change in the risk of incursion of FMD to Great Britain from the outbreaks of FMDV-SAT1 in Iraq and consider an overall **medium** risk of introduction of disease from any affected region in the world including Europe. The risk from illegal imports is difficult to quantify but travellers from the Middle East and other third country areas who bring meat or dairy products can face prosecution and a large fine.

Ongoing conflict and geopolitical tensions in the Middle East add to the complexity of collaborative efforts, and these situations affect both disease control and surveillance capabilities in the affected areas.

We will continue to monitor the situation and remind livestock keepers of the importance of maintaining strict on-farm biosecurity, compliance with the swill feeding ban, and the reporting of all suspicions of notifiable disease promptly. Swill feeding any animal, whether pigs, poultry, ruminants, or wildlife is illegal and has the potential to cause substantial harm. We would like to emphasise to all keepers of livestock, including smallholders, and the general public to ensure that livestock are not fed catering waste, kitchen scraps or products of animal origin, thereby observing the swill feeding ban. All keepers of livestock, whether commercial holdings or not, should remain vigilant, as with all biosecurity, these measures are only as effective as the people using them, so proper training should be provided.

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This publication is available at https://www.gov.uk/government/collections/animal-diseases-international-monitoring

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