Swine Health Information Center

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CENTER FOR ANIMAL HEALTH AND FOOD SAFETY

UNIVERSITY OF MINNESOTA

# Swine Disease Global Surveillance Report

**Worldwide pork production is highly interconnected by trade between countries and markets which could increase the risk of introduction of foreign pathogens into the US.**

## PROJECT

The aim of these reports is to have a system for near real-time identification of hazards that will contribute to the mission of assessing risks to the industry and ultimately, facilitate early detection and identification, or prevent occurrence of events, in partnership with official agencies, and with our international network of collaborators.

Monthly reports are generated through a systematic process that involves screening various official data sources, including government and international organization websites, as well as softer sources such as blogs, newspapers, and unstructured electronic information from around the world. These data are then curated to create a raw repository.

Subsequently, a multi-criteria rubric is applied to evaluate each event. This rubric assesses factors like novelty and the potential direct and indirect financial impacts on the US market. The outcome of this rubric application is a final score assigned to each event.

These final scores, along with an epidemiological interpretation of the event's context, are published.

The interpretation encompasses details like the credibility of the information, the scale and speed of the outbreak, its connectedness to other factors, and the local capacity to respond.

*These communications and the information contained therein are for general informational and educational purposes only and are not to be construed as recommending or advocating a specific course of action.*


CENTER FOR ANIMAL HEALTH AND FOOD SAFETY

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# Swine Disease Global Surveillance Report

Tuesday, December 5, 2023 to Monday, January 1, 2024

## Report Highlights

- **2023 summary:** highlights of events across the six continents (Asia, Africa, Europe, Oceania, North America, and South America) - over 780,000 pigs directly affected by the outbreaks of seven diseases (ASF, PRV, JEV, FMD, CSF, PED, Nipah).
- **FMD in depth:** an overview of the disease dynamic throughout the year - outbreaks reported in 30 countries in 2023.
- **Russia resumes pork exports to China:** The country is set to resume pork exports to China after a 15-year break, following the lifting of a ban imposed by Beijing due to an African swine fever outbreak in 2008.

### *Surveillance at Points of Entry*

- **ASF in Taiwan**: A new type of ASF was detected at the border for the first time. This new strain - recombinants of genotype I and II ASFVs - was first confirmed in 2022 and has been found in various regions of China, including Jiangsu, Henan, and Inner Mongolia.

## DECEMBER 2023 - OUTBREAKS BRIEF

| R | Location | Date | Dx | Impact |
|---|---|---|---|---|
| 2 | **Primorskiy region, Russia** | 12/14 | ASF | Farm with over 50,000 pigs affected. |
| 2 | **Taipei Airport, Taiwan** | 12/28 | ASF | New variant detected in seized pork. |
| 1 | **Hong Kong** | 12/23 | ASF | 2,800 pigs culled - in the fourth farm affected. |
| | **Central province of Nghe An, Vietnam** | 12/29 | ASF | Nearly 8,000 pigs were culled. |
| 1 | **Canada** | 12/28 | Strep equi | 60 pigs died over a week. |
| 1 | **Punjab state, India** | 12/28 | AI (H1N1) | 51 human cases confirmed. |

*Outbreaks described in the table above are colored according to an assigned significance score. The score is based on the identified hazard and potential to affect the US swine industry. Rank (R) Blue: 1 - no change in status; Red: 2 - needs extra attention as the situation is dynamic; Black: 3 - requires consideration or change in practices to reduce exposure to the US swine industry.*

## 2023 HIGHLIGHTS

### January

- **ASF re-emerges in Greece -** for the first time since 2020 in wild boar
- **Aujezky's disease in Brazil:** first outbreak in 20 years involving a smallholder farm in Rio Grande do Sul, the third-largest pig-producing state
- **First reports of FMDV SAT-2 in Middle East:** multiple countries affected - Iraq, Jordan, and Oman

### February

- **First ASF case reported in Singapore:** virus is detected in a dead wild boar discovered in a nature park in North-West Singapore

### March

- **First outbreak of ASF in Cebu Province, the Philippines:** this province managed to remain ASF free for three years, safeguarding one of the largest hog industries in the Visayas region, with an economic value exceeding P11 billion (over USD $200 million).
- **FMDV serotype SAT 2 reaches Turkey:** over 25,000 animals considered susceptible.

### April

- **ASF in Greece:** first outbreak in domestic pigs since Feb 2020 on a farm with 675 animals
- ***Streptococcus suis* in Bali**: causes over 38 human meningitis cases; public health alert issued.
- **ASF in Indonesia**: Major outbreak on Riau Islands pig farm; potential risk to 285,034 animals after Singapore import case.

### May

- **ASF in Italy: First detection in Calabria and Campania, southern region -** a significant long-distance jump of almost 500 miles from the nearest affected area in the region of Lazio, affecting both wild boar and domestic pigs
- **FMD incursion in South Korea after a lapse of over four years:** 11 new FMD outbreaks reported south of Seoul, affecting domestic cattle and goats with a total of 33 cases and 1649 susceptible animals

### June

- **ASF in Bosnia and Herzegovina/Croatia**: first cases detected in three farms between June 21 and 23.
- **ASF in Lithuania**: Two outbreaks after a year's hiatus.
- **ASF in Lombardy, Italy**: First case in a dead boar in salami region spurs industry concern – region with over 4.15M pigs (across 2300 farms).

### July

- **ASF in Kosovo:** first outbreak - marking the entry of the disease in the 24th country in the region
- **ASF re-emergence in Estonia**: first outbreak in domestic pigs since 2021- two confirmed cases involving 116 pigs and over 9,000 pigs respectively.

### August

- **ASF in Scandinavia:** Sweden reports its first case: dead wild boars discovered approximately 124 miles northwest of Stockholm testing positive.
- **ASF in Lombardi, Italy**: first pig farm affected, two months after the initial detection in wild boar - a week later new outbreaks were reported on two neighboring farms, raising concerns about delayed reporting.

## September

- **ASF in Lombardy**: 35,000 pigs culled across 22 farms - ranging from small-scale to those housing up to 8,770 pigs, concentrated within a 2.5-mile (4 km²) area
- **ASFV genotype 2 detected for the first time in Sardinia**: testing of three animals confirmed the presence of this genotype in the island.
- **ASF in Russia:** Over 57,000 pigs culled in the Krasnodar region.
- **ASF in Mongolia**: first cases reported since March 2019: outbreaks on two farms affecting 350 animals.

## October

- **ASF in South Korea**: Continued to spread southward as far as Cheongsong County - 64 new cases in wild boar.
- **ASF in Russia**: New outbreak in Voronezh region, Russia – AgroEko farm, housing over 117,000 pigs

## November

- **ASF in Bangladesh**: first outbreak, becoming the 19th country in Asia to confirm the disease.
- **First ASF case in the Emilia-Romagna region, Italy**: a dead wild boar tested positive.
- **Classical Swine Fever in Brazil**: confirmed case outside the CSF-free zone, which protects over 95% of the Brazilian pig industry - no restrictions on international trade
- **ASF in Hong Kong:** after the initial report, over 7,000 pigs culled across different farms.

## December

- **FMD serotype O re-emerges in China**: impacting 156 domestic pigs: illegal movement of animals identified as a source of event or origin of infection. Last FMD cases in this region were reported in December 2020
- **ASF in Russia**: ASF hits a farm with over 50,000 pigs in Primorskiy region.

Over 80 events of interest for the swine industry that described the presence of a new agent in a country or region, or a significant update on the epidemiology of the disease already present in a region, were identified and presented in these monthly reports (Figure 1).

***Distribution of events included in the SDGS during 2023 by disease***

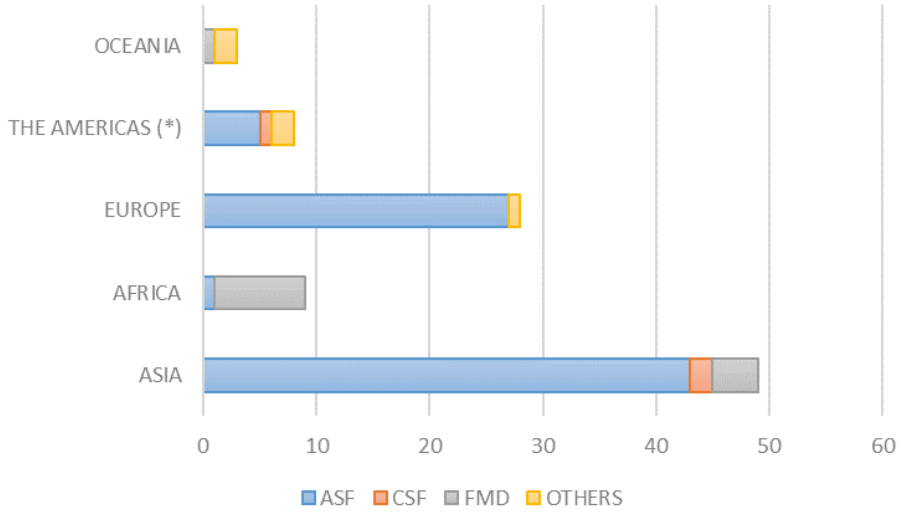


*Figure 1. Distribution of events reported by region.*
*(* disambiguation: The term The Americas refers to the Western continent, including North America, South America, and the Caribbean)*

ASF remains the primary disease in terms of event frequency and geographical spread. However, over 10% of recent events relate to other concerning agents, marking a notable decrease compared to 2022, when non-ASF-related events constituted 25% of the total ( Figure 2).

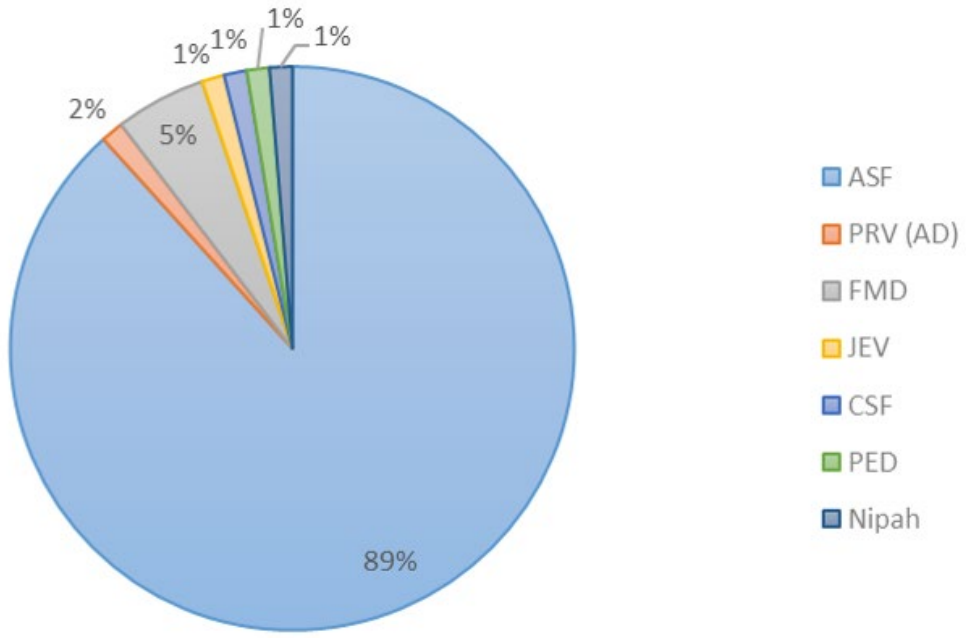


*Figure 2. Distribution of events reported during 2023 by disease*

Jointly, these events involved over 780,000 pigs directly affected by the outbreaks (this number doesn't include any population of animals culled to limit the spread of the diseases or secondary outbreaks reported afterward).

In 2023, six countries – Bosnia and Herzegovina, Croatia, Kosovo, Sweden, Singapore, and Bangladesh – reported their first cases of ASF. Additionally, five countries – Lithuania, Greece, Italy, Mongolia, and The Philippines – experienced a resurgence of ASF after a lengthy period without cases or reported the disease's emergence in previously unaffected significant areas. This trend underscores the ongoing expansion of ASF into new territories and regions within countries already battling the disease. (Figures 3 and 4)

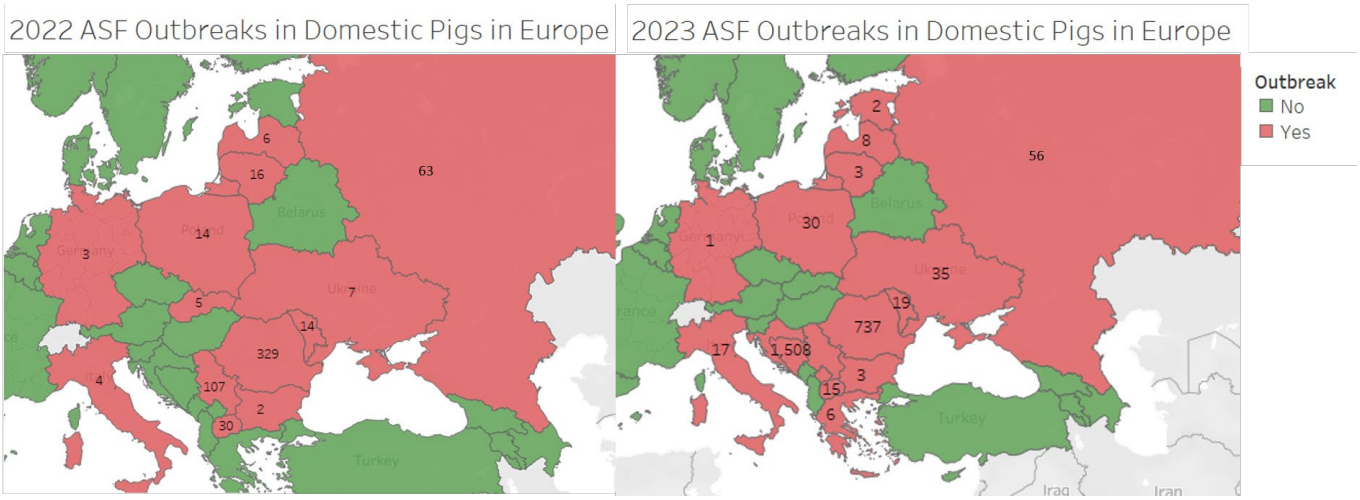


*Figure 3. Comparative distribution of ASF outbreaks in domestic pigs across Europe between 2022 and 2023*

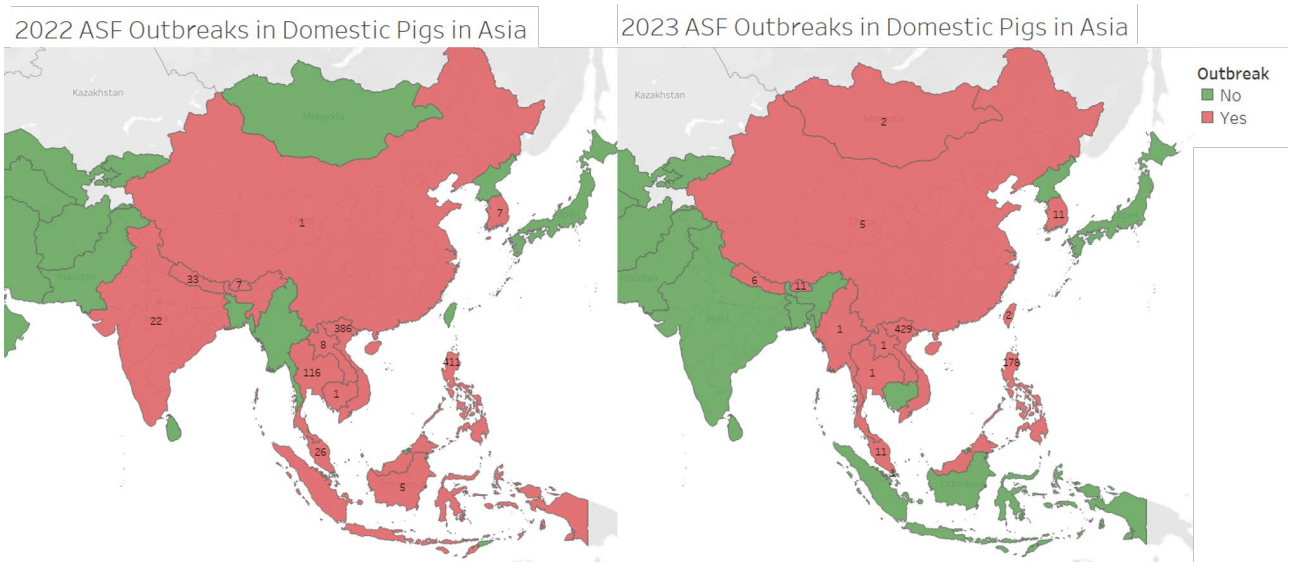


*Figure 4. Comparative distribution of ASF outbreaks in domestic pigs across Asia between 2022 and 2023*

The last WOAH situation report (Nr 43) highlighted that:

- This spread confirms the global threat of the disease and highlights the importance of implementing biosecurity measures, an early reporting and response system, and maintaining a high level of disease awareness among all actors involved in the value chain.
- Surveillance programs, as part of an early detection system, should be adapted to the local epidemiological context and cover domestic, and wild and feral suid populations (if they are involved) since short-distance transmission of ASF seems to depend mainly on the wild boar population density and their interaction with low-biosecurity pig production systems. Long-distance transmission may be associated with human activities.
- Non-compliant and poor-quality vaccines may not confer any protection against ASF and risk spreading vaccine viruses that could result in acute or chronic disease. These vaccine viruses could also recombine with field strains to generate novel strains that could evade detection and result in acute, chronic, and persistent ASF infections on farms.

- Any vaccination strategy for ASF should be undertaken as part of a well-designed vaccination program that considers factors including the local epidemiology of ASF, the expected objectives, and the adequacy and sustainability of the relevant technical, financial, and human resources. The vaccination program should also include post-vaccination surveillance and monitoring as well as an exit strategy for the cessation of vaccination, as per Chapter 4.18. of the Terrestrial Code.

## Policy Updates and Major Breakthroughs

### March

- Colombia updated FMD status: national authorities have officially announced that the entire Colombian territory has been certified as free of FMD by WOAH.
- The Dominican Republic implements a new strategy for ASF surveillance: authorities have introduced a regulation mandating sampling every 21 days.
- The European Union has introduced a new Regulation for ASF control to address the evolving epidemiological situation. This regulation incorporates specific prohibitions and risk-mitigating measures for the movement of porcine animals within restricted zones and expanding disease control measures to prevent the spread of ASF in the EU, particularly in areas identified as protection and surveillance zones following outbreaks in previously disease-free Member States or zones.

### April

- Brazil bans the use of FMD vaccine in seven states to secure FMD-free status without vaccination: storage, sale, and use of FMD vaccines are prohibited. Affected states represent almost half of the country's cattle and buffalo herds and will no longer need to vaccinate approximately 113 million head of livestock.

### July

- The USDA releases an updated version of the ASF Response Plan: the Red Book. The plan includes measures such as the establishment of an ASF Protection Zone in US territories, enhanced surveillance efforts, the implementation of the US Swine Health Improvement Program, and the development of tailored response plans for meat harvest, rendering, and spray dried blood/plasma facilities, aiming to bolster preparedness and mitigate potential outbreaks in the United States.
- First vaccines against ASF approved for commercial use: Vietnam's Ministry of Agriculture and Rural Development authorizes locally produced vaccines, namely NAVET-ASFVAC and AVAC ASF LIVE, representing the world's first commercial solutions against ASF.

### October

- ASFV genotype I was eradicated in Sardinia: The European Commission has officially acknowledged the successful eradication of ASF from wild boars across the island, marking a historical achievement.

# African Swine Fever

## Regional Highlights

### ASIA

Five countries (China, Vietnam, The Philippines, India, and Bangladesh) reported ASF outbreaks in domestic swine in December. India and South Korea reported new ASF cases in wild boars.

**Regional highlights:**

- **Russia | December**: The country is set to resume pork exports to China after a 15-year break, following the lifting of a ban imposed by Beijing due to an ASF outbreak in 2008. The resumption comes after China's thorough evaluation of Russia's ASF control measures and visits by Chinese inspectors to Russian pig breeding enterprises. With all essential protocols and export certificates in place, this development is expected to strengthen agricultural cooperation between the two countries. The head of the national agricultural watchdog Rosselkhoznadzor, Sergey Dankvert, noted the potential for Russia to supply China with pork parts that are in demand but less popular in Russia, while the head of Russia's national Union of Pork Producers, Yury Kovalev, pointed to Russia's successful ASF containment efforts and the importance of targeted import controls over blanket bans. The move signals a significant step in the agricultural trade dynamics between Russia and China.

- **Taipei, Taiwan | December 18:** A new type of ASF was detected at a border for the first time, according to reports from the Central News Agency and other sources. This virus was found in pork products, specifically "crispy sausage," brought into the country by passengers arriving from China. The Veterinary Research Institute of the Ministry of Agriculture highlighted the serious threat posed by this new virus strain, which is causing a significant increase in cases in China and could potentially trigger another crisis in the rest of the region.

    - Key points related to this finding:

        - New Virus Detection: The new ASF virus was first detected in pork products carried by passengers from China. It represents a genetic reassortment of a low virulence genotype I virus with the more common genotype II virus. This new strain was first confirmed in 2022 and has been found in various regions of China, including Jiangsu, Henan, and Inner Mongolia.

        - High Pathogenicity and Transmission: Laboratory experiments have shown that the new virus is highly pathogenic and transmissible. Moreover, vaccines developed by removing the virulence gene have been ineffective against this new strain.

        - Increased Detection Rates: In 2023, as of December 15, a total of 1,733 meat products were intercepted at the border, with 79.3% originating from mainland China. The detection rate of ASF virus in these products was 12.4%, an increase compared to 9.9% in 2021 and 11.8% in 2022.

        - Preventive Measures: In response, border inspections have been strengthened to detect and prevent the smuggling of pork products. Measures to prevent foot-and-mouth disease are also being enforced, including prohibiting mainland tourists from visiting livestock farms and tourist ranches.

## Foot-and-Mouth Disease

In 2023, foot-and-mouth disease posed persistent challenges for Africa and Asia. Data compiled from the World Animal Health Information System,, the EMPRES-i+ Global Animal Disease Information System by FAO, and the World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD/EuFMD) revealed outbreaks reported in 30 countries this year.

In Africa, 10 countries—Egypt, Ethiopia, Algeria, Libya, South Africa, Malawi, Nigeria, Somalia, Rwanda, and Tunisia—have grappled with various serotypes of FMD affecting diverse livestock species such as cattle, goats, sheep, and African buffalo. Simultaneously, across Asia, 20 countries—Cambodia, China, Iraq, Israel, Jordan, Korea (Rep. of), Malaysia, Nepal, Oman, Palestine, Saudi Arabia, Turkey, Indonesia, Mongolia, Iran, North Korea, Bahrain, Thailand, Pakistan, and Qatar—have reported instances of FMD, indicating its widespread presence throughout the region.

However, among the 30 countries grappling with FMD outbreaks, only 22 provided reports to WOAH through animal disease events or biannual summaries. Analyzing the data submitted to WOAH for 2023 reveals a total of 315 new FMD outbreaks across 22 countries, with a total of 80,292 cases and 1,194 direct deaths among a susceptible population of 1,771,382 animals. These figures mark a decrease in new outbreaks and cases compared to the previous year (2022), which saw 758 new outbreaks, 104,800 cases, 1,585 deaths, and a susceptible animal count of 1,535,890.

*Figure 5. The distribution of foot-and-mouth disease outbreaks across Africa and Asia - 2023* (Source: FAO EMPRES-i).

Highlights of the global FMD situation in 2023:

- **Iraq | January**: The year began with FMD serotype SAT2 viruses being reported for the first time in Iraq, with a significant surge in outbreaks, reaching a total of 36 reported cases in

January 2023. By February, samples collected in December 2022 and January 2023 from cattle and water buffalo in Baghdad and Nineveh governorates confirmed the presence of FMD type SAT2 belonging to topotype XIV. These samples were sequenced by the FMD Institute (FMDI), Ankara, Türkiye, and the FMD virus VP1 region sequences were submitted to the WRLFMD. According to reports by the WOAH-FAO FMD reference laboratory, the FMD SAT2 virus that spread to Iraq is similar to viruses detected in Ethiopia in 2022. Iraq is one of the countries grouped under West Eurasia and the Middle East, where serotypes A, Asia 1, and O are known to be circulating.

- **Turkey | March:** A new strain of FMD, specifically FMD serotype SAT2, was first reported on March 3 when suspected clinical signs were observed in newly introduced cattle in Asagimahalle, Iğdır. By March 8, the diagnosis was confirmed, and subsequent outbreaks in cattle and sheep were reported, totaling six outbreaks with 58 cases (53 cattle, 5 sheep) and 25,067 susceptible animals by March 31. Control measures were implemented to curb further spread, including vaccination of 3,500 animals within a 6.2-mile (10 km) radius, quarantine, movement control, disinfection, and surveillance. Iraq and Jordan had previously detected FMDV SAT-2 since January 2023.

**Outbreak Investigation & Response**

The timeline of FMD SAT2 outbreaks in Iraq was deemed significant for assessing the probability and source of the outbreaks in Turkey. The genetic sequence received from a sample collected on March 3 in Tuzluca, Igdir Province, belonged to topotype XIV. Serotype SAT2, a first-time identification in Turkey, led to the closure of provincial and district livestock markets and the prohibition of intercity animal transport. A new vaccine against the strain was rapidly developed and deployed in the field.

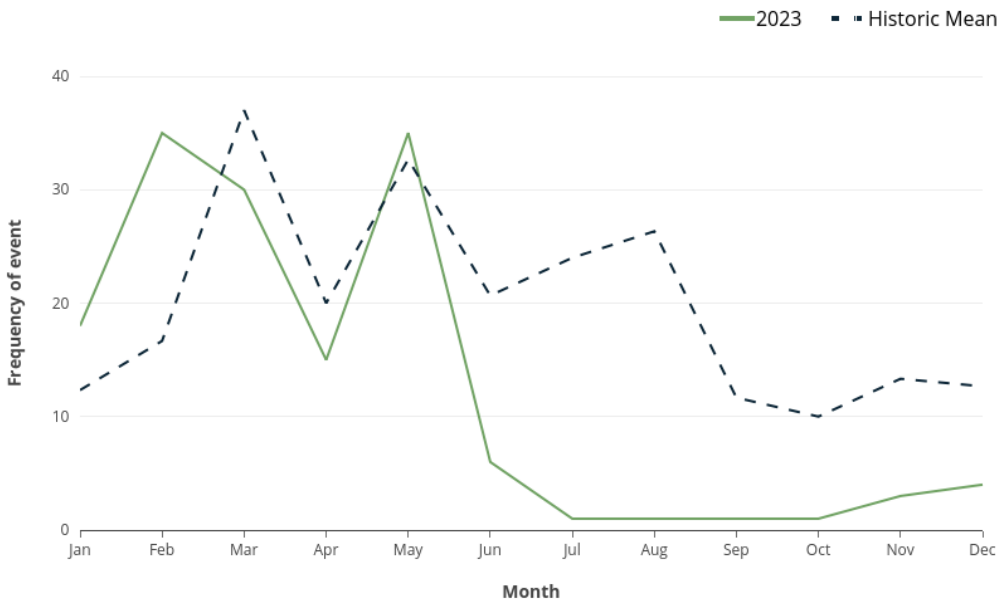


*Figure 6. Frequency of FMD outbreaks throughout 2023 compared with the historical mean (last three years)* (Source: FAO EMPRES-i).

- **China | April and May:** Between April and May 2023, three outbreaks of FMD type O were recorded at various disinfection stations in China. The first outbreak occurred on April 10 at the

Leiping Animal Health Inspection station in Guangxi province. Subsequently, on April 11, another outbreak was detected at the Erbatai Animal Health Inspection station in Guangxi, Aksu, Xinjiang Uygur. The third outbreak, reported on May 19, emerged at the Heshuoxian disinfection station in Hoxud, Bayin'gholin Mongol, Xinjiang Uygur. These outbreaks, involving eight confirmed cases of FMD among cattle, were identified during routine inspections of legally transported animals, prompting immediate movement control measures to contain the spread. Since 2010, serotypes O and A have been reported in China.

- **South Korea | May**: Multiple outbreaks of FMD occurred in the Republic of Korea in May. Eleven outbreaks affecting domestic cattle and goats were reported to WOAH between May 10 and May 19. These outbreaks encompassed a total of 33 cases among susceptible animals, numbering 1,649. The identified virus strain, serotype O, was already prevalent in Korea. Despite high vaccination coverage (above 95%) in most affected areas, additional vaccination efforts were initiated in response to these outbreaks. Emergency quarantine measures were swiftly implemented, including livestock movement restrictions, culling confirmed cases and susceptible animals, and intensive disinfection procedures.

  Authorities suspected the virus might have originated from Southeast Asia, and ongoing investigations were underway to determine its source. This marked the first occurrence of FMD in over four years, with the last confirmed case in Korea reported back in April 2019. Further, on May 26, 2023, the regional reference laboratory received the confirmation of an FMD type O VP1 sequence. The genetic analysis identified it as belonging to the O/ME-SA/Ind-2001e sublineage. This FMD virus strain emerged in India in 2001 and has since widely spread in East and South East Asia. and has previously spread to cause outbreaks in the Russian Federation in 2021, Kazakhstan, and Indonesia in 2022.

  Initially confirmed on May 10, this outbreak originated on three Korean beef farms in Cheongju, North Chungcheong Province. Immediate emergency quarantine measures were activated in the province, culling livestock from the affected farms. Subsequent surveillance identified nine more farms in the vicinity with FMD within the following week. The outbreak was declared resolved in WAHIS on May 23.

- **China | December:** On December 7, an outbreak of FMD serotype O was confirmed among domestic swine at a Qijiang slaughterhouse in Chongqing. Real-time reverse transcription polymerase chain reaction confirmed seven cases, prompting the culling and disposal of all 156 susceptible pigs. This serotype had previously been reported in the same geographic area on December 30, 2020. Chinese authorities swiftly implemented control measures in the affected region, including heightened disease screening, movement restrictions, disinfection protocols, and culling of affected animals.

## *Streptococcus equi subspecies zooepidemicus*

**Canada | December 28**: The report from National Hog Farmer, authored by Ann Hess, addresses a significant outbreak of *Streptococcus equi subspecies zooepidemicus* (Strep zoo) in Canadian swine herds. This pathogen, previously a concern mainly in Asia, emerged in North America in 2019, leading to high mortality rates in swine populations.

Veterinarian Frank Marshall provided a detailed case study of an outbreak in a Canadian swine production system, where over 60 deaths occurred over a single weekend in a 5,600 sow operation. The affected sows displayed severe symptoms such as depression, high fever, and respiratory distress, leading to rapid deterioration and death within 12 hours of symptom onset.

The outbreak posed significant management challenges. Gestation crates proved helpful in identifying sick animals, and direct contact was identified as a necessary condition for transmission. Despite efforts, existing vaccines were ineffective against the pathogen.

The financial impact of the outbreak was substantial, with a loss of 750 sows amounting to an estimated $1.3 million in value, in addition to treatment costs. The report also highlights unanswered questions about Strep zoo, including its origins, adaptability to various species, and the duration of immunity it confers.

This report underscores the severe implications of the *Strep zoo* outbreak for the swine industry, emphasizing the disease's rapid spread and high mortality, as well as the complexities in managing and understanding this emergent pathogen.

The National Hog Farmer article was based on the SHIC/AASV webinar held in December 2023.

## Swine Influenza (H1N1)

### ASIA

**India | December 23:** The swine influenza variant virus situation in Punjab, India, has escalated, with the total number of cases reaching 51, as reported on December 23, 2023. A significant portion of these cases, specifically 18, are concentrated in Ludhiana. This increase follows the 203 cases and 42 deaths recorded in the state in 2022. Recently, a 57-year-old resident of Patiala, currently receiving treatment at PGIMER-Chandigarh, has been diagnosed with the disease. Authorities noted that the patient had four primary contacts, all of whom are presently asymptomatic. Health officials emphasized that all these cases have been confirmed to be caused by the H1N1 virus. To combat the spread, flu corners have been established in government hospitals throughout Punjab. Patients showing symptoms like cough, cold, and fever, indicative of an influenza-like illness, are being isolated to prevent further transmission.

### Fact box: Influenza A viruses of swine

Swine influenza is a respiratory disease of pigs caused by type A influenza viruses that regularly cause outbreaks of influenza in pigs. Influenza viruses that commonly circulate in swine are called “swine influenza viruses” or “swine flu viruses.” Like human influenza viruses, there are different subtypes and strains of swine influenza viruses.

Influenza A viruses of swine do not normally infect humans. However, sporadic human infections with influenza viruses that normally circulate in swine and not people have occurred. When this happens, these viruses are called “**variant viruses**.” They also can be denoted by adding the letter “v” to the end of the virus subtype designation.

In recent years, the main Influenza A viruses of swine circulating in US pigs are: swine triple reassortant (tr) H1N1, trH3N2, and trH1N2. With the exception of the 2009 H1N1 virus, influenza viruses that circulate in swine are very different from influenza viruses that commonly circulate in people.

For more information regarding human infections with variant viruses -- LINK

## References:

**Recurrent reports reviewed**

WOAH - **WAHIS interface - Immediate notifications**

WOAH - WOAH Asia Regional office
FAO - ASF situation update in Asia & Pacific
DEFRA - Animal conditions international monitoring reports
CAHSS - CEZD Weekly Intelligence Report
European commission - ADIS disease overview
**FMD reports**
WOAH-FAO Reference lab report Jan-Mar 2023
WOAH-FAO Reference lab report Apr-Jun 2023
WOAH-FAO Reference lab report Jul-Sep 2023
WOAH-FAO Ref lab network annual report 2022
**ASIA**
**Russia**
Russia will start exporting pork to China
**Taiwan**
New variant detected in pork products
**India**
Influenza A virus in India

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