



TAFS Update – African Swine Fever Global Situation February 2023

African Swine fever (ASF) continues to spread further and threatening the global swine industry. Its high mortality rate in domestic pigs and imposed trade restrictions after an outbreak can cause tremendous sanitary, social, and economic impacts in a country (1). Since early 2020, 10 new countries reported occurrences for the first time, and in 2022 alone 3 new countries and 4 new zones reported occurrences for the first time (2). The virus is now present in four continents: Americas, Europe, Africa and Asia (2), with more than 77% of the world's swine population being held in an infected area (3). Although wild boars play a role in the spread of ASF, especially in high population density regions like in Europe and Asia where they can act as reservoirs and vehicle (4), ASF remains a human driven disease.

ASF in Europe

ASF has further spread in Europe, both in domestic and wild pigs, with the latest occurrence happening in Greece at beginning of this year, after reporting the last case in 2020 (5). ASF has been reshaping the European pig sector, by causing a decrease in the number of small sized pig holdings (6) which tend to be at a higher risk of ASF incursion (7). In the European Union, special control measures for ASF are in place, to complement the rules for prevention and control of listed diseases, with the establishment of Zones, categorized by the ASF epidemiological situation, being particularly relevant (8). ASF is still circulating in wild boars across eastern Europe with recent recurrences in Ukraine, Russia, Moldova and Latvia (2).

In Germany, the first case was detected in infected wild boars in September 2020 and in July 2021, the virus was first discovered in domestic pigs. Since then, the virus further spread, affecting several federal states (9). Although exports from Germany continued from non-affected regions after the outbreaks, due to the EU introduced regionalization principle, the virus has had a great impact in the country, due to heavy disruption of extra-EU trade, which led to an oversupply of pork meat and consequently a significant price drop (10) that triggered the rationalization of German pig production (11). While there are still ASF cases in wild boars, the outbreaks in German domestic pig farms have been controlled and the official restrictive measures lifted (9).

In Italy, infected wild boar carcasses were found in the regions of Piedmont and Liguria, in January 2022. In May of the same year, an infected wild boar was found in Rome and in June, also in Rome, the disease was found in a semi-extensive pig farm. As of the writing of this, 279 cases have been confirmed in wild boars and 4 outbreaks have occurred in pig farms (12). To contain the ASF crisis, the Italian Ministry of Agriculture, Food Sovereignty and Forestry announced a 50 million euros aid package directed at the swine industry, with 15 million to be invested in biosecurity improvements and 35 million in farmers' compensation (13).



ASF reaches the Americas

In April 2021, the first cases of ASF in the western hemisphere, over the last 40 years, appeared in backyard domestic pigs in the Dominican Republic. However, it is currently unknown how the virus entered the country (14). Pig shipments were restricted, and the military mobilized to contain the spread, which resulted in the culling of around 73,000 pigs out of a pig population estimated at 1.8 million (15,16). Despite the effort, the Dominican Republic reported 20 new cases in August 2022 (17). ASF was also detected in Haiti, in August 2021 (18). The situation in Haiti is unknown but it must be assumed that the virus is still circulating. The Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture is assisting both countries with the outbreak control efforts and accelerating emergency preparedness efforts in the US (19).

To prevent the entrance of ASF in the mainland, the movement of all live swine, swine germplasm, swine products, and swine byproduct from Puerto Rico and the U.S. Virgin Islands have suspended, via federal order (20). Also, an OIE-recognized foreign animal disease protection zone was established around these zones, this will allow the US to maintain and trade under an ASF free status, even if the disease is found within the protection zone (21). The Canadian government also reacted to these developments by allocating 45.3 million Canadian dollars to support ASF preparedness efforts, 23.4 million to be investments in the pork industry and 19.8 million for the Canadian Food Inspection Agency's (CFIA) (22).

ASF in Asia

Since its introduction to the region in August 2018, ASF spread to 17 Asian countries, including China, East and Southeast Asia and several island in the pacific region. The latest introduction happened in Thailand (2022), Nepal (2022) and South Korea (2023) (23). The biggest challenges to ASF control in the Asian continent are connected to the significant proportion of small holdings in the region with low biosecurity conditions and the common practice of swill feeding (24). The virus will likely continue to spread across the continent, restructuring the pig sector, by selecting the bigger operators who can invest in strict biosecurity measures.



Control efforts

A recently conducted survey among pig and wild boar specialists highlighted that the main risk for the entry and spread of ASF across European countries is associated with wild boars, and the introduction of contaminated products for human consumption. The legal movement of pigs, pork products and fomites was considered less important in the risk pathway, due to the high alert state in Europe (25). This stresses once more the importance of ASF surveillance programs and close collaboration across neighboring countries.

Over the last years, Europe has been making efforts to increase stakeholder awareness and to control of the ASF spread, be it through the Standing Group of Experts on African swine fever in Europe, under the GF-TADs umbrella (26) or EFSA, which launched its third campaign to stop African Swine Fever in July 2022, aiming to raise awareness among farmers, veterinarians and hunters about the prevention and spread of the disease (27). In the Americas, actions are being promoted by the “Crisis Committee ASF LatAm”, which composes of representatives from 18 Latin American countries and the United States (28) or by individual countries that taking extreme precautions to prevent the entry of this disease into their territories.

Several attempts at creating a vaccine, based on different strategies have been made. So far, an attenuated vaccine where the I177L gene was deleted has been showing the most promising results, by successfully providing protection against ASF genotype II (29,30). However, there are technological challenges connected to production of vaccines based on this strategy on a commercial scale (31). In June 2022, the Vietnamese ministry of Agriculture announced the first commercial vaccine against ASF, developed by the state-owned company owned Navetco (32). The plan of vaccinating 600,000 animals was already suspended in August due to the report of “Dozens of deaths” in a sample of 600 vaccinated animals (33). However, starting in February of this year, a new vaccine produced by the company AVAC Vietnam is expected to be distributed nationwide, after reporting that in a pilot injection study of around 600,000 pigs, 93% of the collected samples met the defined technical requirements (34).

While the world awaits a commercially available reliable vaccine for ASF, which would undoubtedly support all the above-mentioned control efforts (25), recent events reiterate the disease status as a global threat, highlighting the importance raising awareness among stakeholders to invest in biosecurity and early response/report systems well adapted to local epidemiological contexts (2).



References

1. African swine fever - WOAAH - World Organisation for Animal Health [Internet]. [cited 2023 Jan 17]. Available from: <https://www.woah.org/en/disease/african-swine-fever/>
2. World Organisation for Animal Health (WAHIS). African swine fever (ASF) – Situation report 24. 2022 [cited 2023 Dec 23]; Available from: <https://www.woah.org/en/document/african-swine-fever-asf-situation-report-24/>
3. ASF, the main threat for the global swine industry - Engormix [Internet]. [cited 2023 Jan 16]. Available from: <https://en.engormix.com/pig-industry/articles/asf-main-threat-global-t47674.htm>
4. ASF, the main threat for the global swine industry - Engormix [Internet]. [cited 2023 Jan 16]. Available from: <https://en.engormix.com/pig-industry/articles/asf-main-threat-global-t47674.htm>
5. OIE World Animal Health Information System (WAHIS) [Internet]. [cited 2023 Jan 30]. Available from: <https://wahis.woah.org/#/dashboards/country-or-disease-dashboard>
6. Bellini S. Understanding and combatting African Swine Fever. Understanding and combatting African Swine Fever [Internet]. 2021 Mar 15 [cited 2023 Jan 17]; Available from: https://www.wageningenacademic.com/doi/pdf/10.3920/978-90-8686-910-7_7
7. Costard S, Zagmutt FJ, Porphyre T, Pfeiffer DU. Small-scale pig farmers' behavior, silent release of African swine fever virus and consequences for disease spread. *Scientific Reports* 2015 5:1 [Internet]. 2015 Nov 27 [cited 2023 Jan 17];5(1):1–9. Available from: <https://www.nature.com/articles/srep17074>
8. EUR-Lex - 32021R0605 - EN - EUR-Lex [Internet]. [cited 2023 Jan 25]. Available from: https://eur-lex.europa.eu/eli/reg_impl/2021/605/oj
9. BMEL - Animal health - African Swine Fever (ASF): information on cases in Germany [Internet]. [cited 2023 Jan 4]. Available from: <https://www.bmel.de/EN/topics/animals/animal-health/african-swine-fever.html>
10. Mccracken C. Pork Quarterly Q4 2020 Export Concentration a Potential Long-Term Risk. 2020;



11. African Swine Fever in Germany: A Turning Point in the Pork Industry [Internet]. [cited 2023 Jan 17]. Available from: <https://research.rabobank.com/far/en/sectors/animal-protein/african-swine-fever-in-germany-a-turning-point-in-the-pork-industry.html>
12. Ministero della Salute-Bollettino epidemiologico nazionale. Peste Suina Africana [Internet]. 2022 [cited 2023 Jan 4]. Available from: <https://storymaps.arcgis.com/stories/7f16f51731654a4ea7ec54d6bc1f90d4>
13. Italian Ministry of Agriculture FS and F. Masaf - 50 milioni di euro a sostegno della filiera suinicola [Internet]. [cited 2023 Jan 4]. Available from: <https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/17742>
14. African swine fever confirmed in Dominican Republic pigs -USDA | Reuters [Internet]. [cited 2023 Jan 8]. Available from: <https://www.reuters.com/world/americas/african-swine-fever-confirmed-dominican-republic-pigs-usda-2021-07-28/>
15. Dominican Republic to kill thousands of pigs over swine fever outbreak | Reuters [Internet]. [cited 2023 Jan 8]. Available from: <https://www.reuters.com/world/americas/dominican-republic-kill-thousands-pigs-over-swine-fever-outbreak-2021-08-02/>
16. Dominican Republic restricts pig shipments, enlists military to fight African swine fever | Reuters [Internet]. [cited 2023 Jan 8]. Available from: <https://www.reuters.com/world/americas/dominican-republic-limits-pig-shipments-uses-military-fight-fatal-hog-virus-2021-07-29/>
17. Dominican Republic reports 20 new ASF cases in August | The Pig Site [Internet]. [cited 2023 Jan 8]. Available from: <https://www.thepigsite.com/news/2022/09/dominican-republic-reports-20-new-asf-cases-in-august>
18. ASF Haiti: Virus moves to second country in Americas - Pig Progress [Internet]. [cited 2023 Jan 8]. Available from: <https://www.pigprogress.net/health-nutrition/asf-haiti-virus-moves-to-second-country-in-americas/>
19. USDA APHIS | History Highlight: APHIS Supports the Fight Against African Swine Fever [Internet]. [cited 2023 Jan 24]. Available from: https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2022/aphis50-hh-asf
20. USDA APHIS | USDA Issues Federal Order as Part of Establishment of Foreign Animal Disease Protection Zone in Puerto Rico and U.S. Virgin Islands to Protect from African Swine Fever [Internet]. [cited 2023 Jan 25]. Available from: https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2021/sa-09/asf-protection-zone-dr-pr



21. Ruiz-Saenz J, Diaz A, Bonilla-Aldana DK, Rodríguez-Morales AJ, Martínez-Gutiérrez M, Aguilar P v. African swine fever virus: A re-emerging threat to the swine industry and food security in the Americas. *Front Microbiol.* 2022 Oct 5;13:3926.
22. Government of Canada announces up to \$45.3 million to enhance African swine fever prevention and preparedness - Canada.ca [Internet]. [cited 2023 Jan 25]. Available from: <https://www.canada.ca/en/agriculture-agri-food/news/2022/08/government-of-canada-announces-up-to-453-million-to-enhance-african-swine-fever-prevention-and-preparedness.html>
23. ASF situation in Asia & Pacific update [Internet]. [cited 2023 Jan 17]. Available from: <https://www.fao.org/animal-health/situation-updates/asf-in-asia-pacific/en>
24. Normile D. African swine fever keeps spreading in Asia, threatening food security. *Science* (1979) [Internet]. 2019 May 14 [cited 2023 Jan 17]; Available from: <https://www.science.org/content/article/african-swine-fever-keeps-spreading-asia-threatening-food-security#:~:text=A%20reservoir%20of%20endemic%20disease,food%20security%20in%20the%20region.>
25. de la Torre A, Bosch J, Sánchez-Vizcaíno JM, Ito S, Muñoz C, Iglesias I, et al. African Swine Fever Survey in a European Context. *Pathogens* [Internet]. 2022 Feb 1 [cited 2023 Jan 24];11(2):137. Available from: <https://www.mdpi.com/2076-0817/11/2/137/htm>
26. Standing Group of Experts on African Swine Fever in Europe - WOAHA – Europe [Internet]. [cited 2023 Jan 25]. Available from: <https://rr-europe.woah.org/en/Projects/gf-tads-europe/standing-groups-of-experts-on-african-swine-fever-in-europe/>
27. Detect, prevent, report: EFSA's African swine fever campaign extended for the third year | EFSA [Internet]. [cited 2023 Jan 25]. Available from: <https://www.efsa.europa.eu/en/news/detect-prevent-report-efsas-african-swine-fever-campaign-extended-third-year>
28. Latin America creates crisis committee for ASF prevention - Swine news - pig333, pig to pork community [Internet]. [cited 2023 Jan 8]. Available from: https://www.pig333.com/latest_swine_news/latin-america-creates-crisis-committee-for-asf-prevention_17680/
29. Borca M v., Ramirez-Medina E, Silva E, Vuono E, Rai A, Pruitt S, et al. Development of a Highly Effective African Swine Fever Virus Vaccine by Deletion of the I177L Gene Results in Sterile Immunity against the Current Epidemic Eurasia Strain. *J Virol* [Internet]. 2020 Mar 17 [cited 2023 Jan 25];94(7). Available from: <https://journals.asm.org/doi/10.1128/JVI.02017-19>



30. Tran XH, Phuong LTT, Huy NQ, Thuy DT, Dung N van, Quang PH, et al. Evaluation of the Safety Profile of the ASFV Vaccine Candidate ASFV-G- Δ I177L. *Viruses* [Internet]. 2022 May 1 [cited 2023 Jan 25];14(5). Available from: <https://pubmed.ncbi.nlm.nih.gov/35632638/>
31. Borca M v., Rai A, Ramirez-Medina E, Silva E, Velazquez-Salinas L, Vuono E, et al. A Cell Culture-Adapted Vaccine Virus against the Current African Swine Fever Virus Pandemic Strain. *J Virol* [Internet]. 2021 Jun 24 [cited 2023 Jan 25];95(14). Available from: [/pmc/articles/PMC8315737/](https://pubmed.ncbi.nlm.nih.gov/35632638/)
32. Vietnam develops “world’s first” African swine fever vaccine for commercial use | Reuters [Internet]. [cited 2023 Jan 4]. Available from: <https://www.reuters.com/business/healthcare-pharmaceuticals/vietnam-develops-worlds-first-african-swine-fever-vaccine-commercial-use-2022-06-01/>
33. Vietnam suspends African swine fever vaccine after pig deaths | Reuters [Internet]. [cited 2023 Jan 4]. Available from: <https://www.reuters.com/world/asia-pacific/vietnam-suspends-african-swine-fever-vaccine-after-pig-deaths-2022-08-24/>
34. African swine fever vaccine to be circulated nationwide from February | Health | Vietnam+ (VietnamPlus) [Internet]. [cited 2023 Feb 1]. Available from: <https://en.vietnamplus.vn/african-swine-fever-vaccine-to-be-circulated-nationwide-from-february/247639.vnp>