

Food security and research agenda in African Swine Fever Virus: a new Arbovirus Threat in the Dominican Republic

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ABSTRACT

An outbreak of African Swine Fever Virus (ASFV) has been reported in La Hispaniola. Ecological niches of transmission and further characterization of vectors involved should be included in a research agenda to reduce the impact on emerging pathogens affecting food security in a previous afflicted region.

The economic impact and health systems caused by the COVID-19 pandemic in developing countries have not yet been well defined. In recent months, an outbreak of diphtheria has been reported in the Dominican Republic (DR) [1] and resurgence of diseases transmitted by vectors and vaccine-preventable have become elements of concern not only for the country but also for the entire Latin American [1]. More recently, cases of the African swine fever virus (ASFV) have been confirmed in more than 14 provinces of the island nation, activating regional epidemiological alerts (figure 1) [1,2].

ASFV is the only member of the Asfviridae family, and the only known DNA arbovirus [3,4] the virus has been following a pattern of endemicity in Africa facilitated by a sylvatic cycle in soft ticks of the genus *Ornithodoros* and *Phacochoerus africanus* [5]. ASFV was first identified in Kenya in 1921 [4] and outbreaks have been reported in Europe and the Americas since. ASFV is highly stable and easily transmissible by infected pigs and contaminated derived products, as well as fomites, or by the transmission of *Ornithodoros* vectors itself. Its expansion outside of Africa has intensified since 2007 [5], affecting four continents and millions of losses to the pig industry. Only in China has it caused it to be unable to produce the demand for pork for its population and importing it almost exclusively from other countries [4].

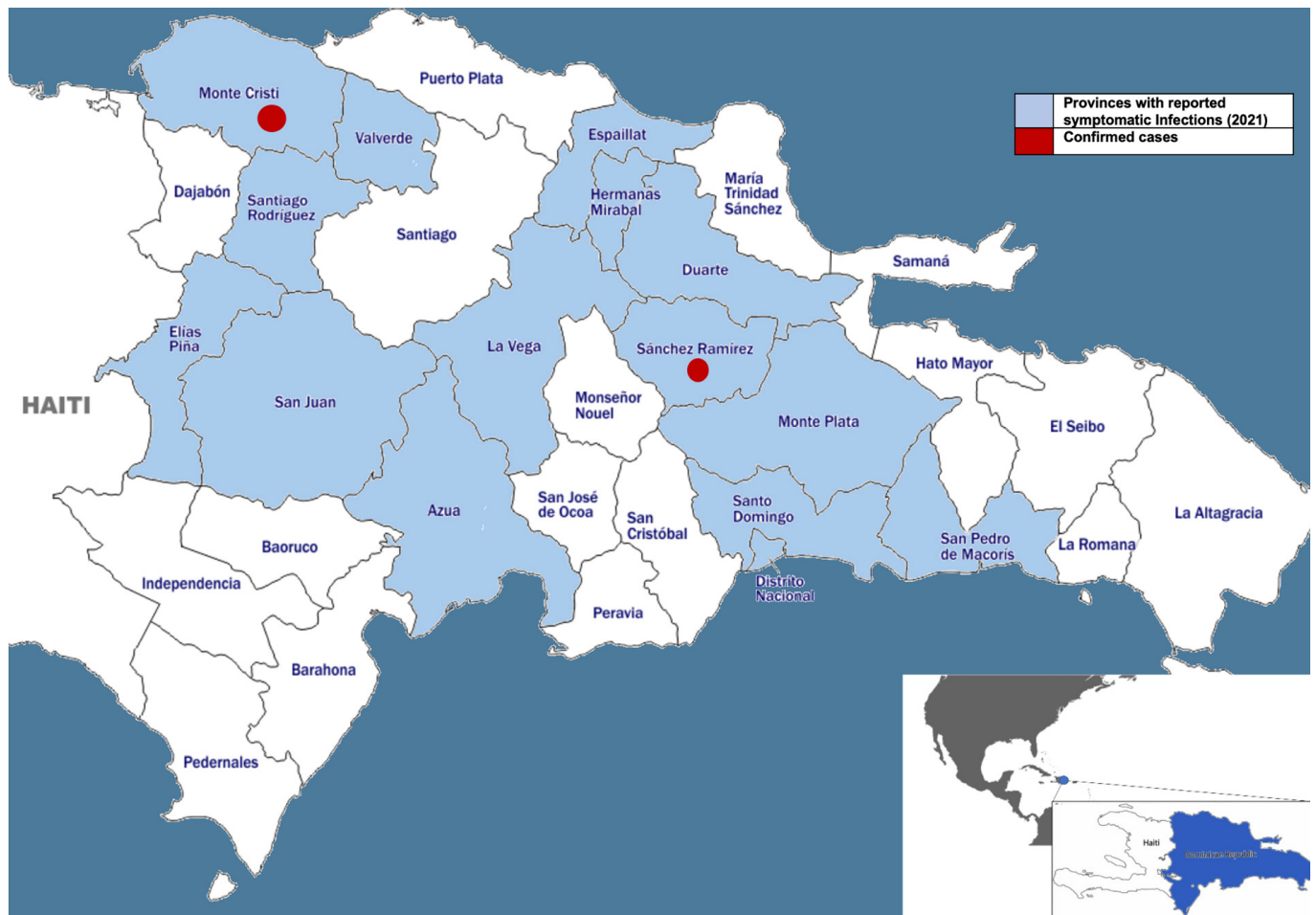
No human ASFV has been confirmed after meat consumption, however, few dare to consume it affecting the economic industry and increasing prices in other similar products. Previously in 1978 [6] a ASFV outbreak was reported, and the complete pig population was eradicated with an estimated to 1.5 million pigs, to reactive the local production a complete replaced breeds were introduced mainly from Europe [4]. After research investigations, Hispaniola's cases were associated to an outbreak in some regions of Spain and Portugal, and spread to Sardinia, Malta, Brazil, the Dominican Republic, Cuba, and Haiti [7].

During the 1978-80's outbreak In the Dominican Republic, small-scale producer of pigs, were hiding animals making a cumbersome activity to detect the complete expansion of the viral transmission across the island [7]. Officially was controlled late 1980, the origin of ASFV circulation was attributed to the feeding of pigs with trash or other food remains. The other source proposed contamination was through the land borders between the DR and Haiti, attributed to sylvatic contact of pigs or traffic in contaminated meat, not controlled by the authorities [7]. To the date their limited information in the scientific literature of circulating ASFV on *Ornithodoros* ticks or other arthropod vectors in La Hispaniola; however, based on the fluctuating reports of ASFV in the same geographical area suggest that tick's vectorial capacity and broad distribu-

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Figure 1. African Swine Fever Virus (ASFV) outbreak in the Dominican Republic (blue, provinces with symptomatic reports; red, confirmed cases by RT-PCR and serological assays).



tion might played an important role of cryptic transmission of the virus in the island over decades.

As July 2020, the Dominican Ministry of Agriculture confirmed "a small outbreak" of ASFV in Montecristi (northwest) and Sánchez Ramírez (Northcentral) provinces, later the World Organisation for Animal Health (OIE) confirmed the viral circulation in 14 provinces including the capital city, Santo Domingo [3]. The first measures adopted by the authorities were to prohibit the mobilization of live or dead pigs from and to provinces, where a "total military control was placed in all strategic points", it is estimated that only in Sanchez Ramirez province there is an estimated 17,000 pigs [9]. As no vaccines are available against the virus, there is a protocol that obliges countries to proceed with the elimination of their pig population (sick, suspected, or healthy), and the destruction of corpses and contaminated products, and disinfection [10].

The agricultural economic sector in the DR only represented 6.0% of GDP in 2020, of which the livestock sub sector accounted for 1.9% of the economy [11]. Measured by contribution to GDP, the effects of the ASFV on the aggregate economy might be underestimated, but its effect on domestic consumption is higher. Pork consumption in 2020 was 2.4 million quintals, [10] approximately 21% of meat consumption in the country, lower than chicken consumption (7.2 million quintals) but higher than beef consumption (1.5 million quintals). Moreover, pork consumption heavily depends on domestic production, approximately 97% of total consumption. It is expected that this situation will increase chicken consumption in the short term, which in turn would increase chicken price given short term restrictions to meet demand in a narrow period [12].

In fact, prices have doubled at the beginning of August, and supermarkets are rationing purchases, which will increase inflation since chicken purchases account for 2.5% of CPI, [12] the highest percentage among goods, therefore the increase in prices due to AFSV are increasing poverty and inequality. The political turmoils in Haiti and the sequelae of a new earthquake, migrants' mobilization and now elements affecting the food security represents a concerning situation in the island nations. The research agenda in AFSV on the distribution and characterization of vectors involved in the AFSV transmission in the Caribbean. It is needed a consistent animal health and production monitoring, with technical expertise, especially among those small farmers, providing rapid disease detection and reporting, sample collection.

This prioritized agenda will be focused on future research in zoonotic diseases and its vectors and will help to fill critical knowledge gaps. Political leadership, local communities, stakeholders, and researchers from Academia should all support these priority questions and themes to collaboratively drive to move forward.

REFERENCES

1. Pan American Health Organization. World Health Organization. Epidemiological Update: Diphtheria. 2 March 2021, Washington, D.C.: PAHO/WHO; 2021 [retrieved on August 24th, 2021]. Available at: <https://iris.paho.org/bitstream/handle/10665.2/53380/EpiUpdate2March2021_eng.pdf?sequence=1&isAllowed=y>.
2. Panamerican Health Organization (PAHO): <https://www.paho.org/en/news/28-7-2021-latin-america-and-caribbean-face-avalanche-worsening-health-issues-if-covid-19>
3. World Organisation for Animal Health (OIE), AFSV report in the Dominican Republic. [Retrieved August 27th, 2021]. Available at: <https://wahis.oie.int/#/report-info?reportId=36844>
4. Cwynar P, Stojkov J, Wlazlak K. African Swine Fever Status in Europe. *Viruses*. 2019 Mar 30;11(4):310. <http://dx.doi.org/10.3390/v11040310>
5. Penrith ML, Bastos AD, Etter EMC, Beltrán-Alcrudo D. Epidemiology of African swine fever in Africa today: Sylvatic cycle versus socio-economic imperatives. *Transbound Emerg Dis*. 2019 Mar;66(2):672-686. <http://dx.doi.org/10.1111/tbed.13117>
6. Oficial Presidential decree on ASFV in the Dominican Republic (1978) [Retrieved on August 27th, 2021]. Available at: <<https://repositorio.unphu.edu.do/bitstream/handle/123456789/3067/7-Decreto%20n%C3%BAmero%20146%20del%20poder%20ejecutivo.pdf?sequence=1&isAllowed=y>>.
7. Alexander FC. Experiences with African swine fever in Haiti. *Ann N Y Acad Sci*. 1992 Jun 16;653:251-6. <http://dx.doi.org/10.1111/j.1749-6632.1992.tb19654.x>
8. World Organisation for Animal Health (OIE), AFSV report in the Dominican Republic [Retrieved August 27th, 2021]. Available at: <<https://wahis.oie.int/#/report-info?reportId=36844>>.
9. Ministry of Agriculture, Dominican Republic, agricultural and economic activities [retrieved on August 27th, 2021]. Available at: <<https://agricultura.gob.do/wp-content/uploads/2021/06/1.3-Ponderacion-Corriente-por-Actividad-Economica-2007-2019-1-1.xlsx>>.
10. Ministry of Agriculture, Dominican Republic, agricultural and economic activities [retrieved on August 27th, 2021]. Available at: <<https://agricultura.gob.do/wp-content/uploads/2021/06/10.1-Consumo-Estimado-2015-2020.-En-Quintales.xlsx>>.
11. Central Bank, Dominican Republic, Consumer Prices Index (2019-2020) [retrieved on August 27th, 2021]. Available at: <https://cdn.bancentral.gov.do/documents/estadisticas/precios/documentos/Anexos_documento_metodologico_IPC_base_anual_oct_2019-sep_2020.xlsx?v=1628459564045>.
12. Nunez N, 2020. Crece demanda por carne de pollo pese a aumento de precio [retrieved August 27th, 2021]. Available at: <<https://listindiario.com/la-republica/2021/08/08/682903/crece-demanda-por-carne-de-pollo-pese-a-aumento-de-precio>>.

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