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1 **OPINION PAPER**

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4 **Food Security and Research Agenda in African Swine Fever Virus: a new**  
5 **Arbovirus Threat in the Dominican Republic**

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13  
14 **Abstract**

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

19  
20  
21 The economic impact and health systems caused by the COVID-19 pandemic in  
22 developing countries have not yet been well defined. In recent months, an outbreak of  
23 diphtheria has been reported in the Dominican Republic (DR)<sup>1</sup> and resurgence of  
24 diseases transmitted by vectors and vaccine-preventable have become elements of  
25 concern not only for the country but also for the entire Latin American.<sup>1</sup> More recently,  
26 cases of the African swine fever virus (ASFV) have been confirmed in more than 14  
27 provinces of the island nation, activating regional epidemiological alerts [Figure 1].<sup>2,3</sup>

28  
29 ASFV is the only member of the *Asfaviridae* family, and the only known DNA arbovirus,<sup>4</sup>  
30 the virus has been following a pattern of endemicity in Africa facilitated by a sylvatic cycle  
31 in soft ticks of the genus *Ornithodoros* and *Phacochoerus africanus*.<sup>5</sup> ASFV was first  
32 identified in Kenya in 1921<sup>4</sup> and outbreaks have been reported in Europe and the  
33 Americas since. ASFV is highly stable and easily transmissible by infected pigs and  
34 contaminated derived products, as well as fomites, or by the transmission of *Ornithodoros*  
35 vectors itself. Its expansion outside of Africa has intensified since 2007<sup>5</sup>, affecting four  
36 continents and millions of losses to the pig industry. Only in China has it caused it to be  
37 unable to produce the demand for pork for its population and importing it almost  
38 exclusively from other countries.<sup>4</sup>

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

48  
49 During the 1978-80's outbreak In the Dominican Republic, small-scale producer of pigs,  
50 were hiding animals making a cumbersome activity to detect the complete expansion of  
51 the viral transmission across the island.<sup>7</sup> Officially was controlled late 1980, the origin of  
52 ASFV circulation was attributed to the feeding of pigs with trash or other food remains.  
53 The other source proposed contamination was through the land borders between the DR  
54 and Haiti, attributed to sylvatic contact of pigs or traffic in contaminated meat, not  
55 controlled by the authorities.<sup>7</sup> To the date their limited information in the scientific literature  
56 of circulating ASFV on *Ornithodoros* ticks or other arthropod vectors in La Hispaniola;  
57 however, based on the fluctuating reports of ASFV in the same geographical area suggest  
58 that tick's vectorial capacity and broad distribution might played an important role of  
59 cryptic transmission of the virus in the island over decades.

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

70 The agricultural economic sector in the DR only represented 6.0% of GDP in 2020, of  
71 which the livestock sub sector accounted for 1.9% of the economy.<sup>11</sup> Measured by  
72 contribution to GDP, the effects of the AFSV on the aggregate economy might be  
73 underestimated, but its effect on domestic consumption is higher. Pork consumption in  
74 2020 was 2.4 million quintals,<sup>10</sup> approximately 21% of meat consumption in the country,  
75 lower than chicken consumption (7.2 million quintals) but higher than beef consumption  
76 (1.5 million quintals). Moreover, pork consumption heavily depends on domestic  
77 production, approximately 97% of total consumption. It is expected that this situation will

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78 increase chicken consumption in the short term, which in turn would increase chicken  
79 price given short term restrictions to meet demand in a narrow period.<sup>12</sup>

80  
81 In fact, prices have doubled at the beginning of August, and supermarkets are rationing  
82 purchases, which will increase inflation since chicken account for 2.5% of CPI,<sup>12,14</sup> the  
83 highest percentage among goods, therefore the increase in prices due to AFSV are  
84 increasing poverty and inequality. The political turmoils in Haiti and the sequelae of a new  
85 earthquake, migrants' mobilization and now elements affecting the food security  
86 represents a concerning situation in the island nations. The research agenda in AFSV on  
87 the distribution and characterization of vectors involved in the AFSV transmission in the  
88 Caribbean. It is needed a consistent animal health and production monitoring, with  
89 technical expertise, especially among those small farmers, providing rapid disease  
90 detection and reporting, sample collection.

91  
92 This prioritized agenda will be focused on future research in zoonotic diseases and its  
93 vectors and will help to fill critical knowledge gaps. Political leadership, local communities,  
94 stakeholders, and researchers from Academia should all support these priority questions  
95 and themes to collaboratively drive to move forward.

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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).**

