

¿Qué Vía de Introducción de Peste Porcina Africana supone una Mayor Amenaza para China?

What Source of African Swine Fever poses the Greatest Threat to China?

Nicola Scorovich, Cristina Jurado y José Manuel Sánchez-Vizcaíno

Universidad Complutense de Madrid

Resumen

Siendo China el líder del sector porcino, la entrada y difusión de la peste porcina africana (PPA) supondría un gran impacto tanto a nivel social como económico. A pesar de ser el principal productor porcino, China depende de las importaciones para suplir la alta demanda interna de productos derivados del cerdo. La compra de producto externo podría suponer, por tanto, un riesgo de entrada de PPA en el país dada la distribución actual de la enfermedad. Otro aspecto a tener en cuenta es la proximidad de China a zonas endémicas, así como su relación comercial con áreas afectadas del este de Europa y África subsahariana. Además, la creciente inversión de China en el continente africano ha incrementado notablemente el flujo migratorio, pudiendo conllevar la entrada de productos de origen porcino potencialmente contaminados. La evaluación de los riesgos mencionados anteriormente permitiría la implementación de medidas preventivas eficaces que minimizase el riesgo de introducción de la PPA en China.

Palabras clave: China, industria porcina, medidas preventivas, riesgos, PPA.

Abstract

Leading the global pork industry, China is left susceptible to socio-economic damage in the wake of an African Swine Fever (ASF) outbreak. China is both the world's largest producer and consumer of pork, yet the country still relies on foreign pork imports to fulfil the demand. With ASF endemic to more countries now than ever before, China's reliability on these imports, often from multiple origins, presents a great threat to their current ASF free status. China's proximity and trade with, or near to ASF endemic regions of Eastern Europe are also to be taken into account. Furthermore, a second endemic source of a potential ASF introduction to China, often overlooked, is Africa. With the disease endemic to much of Sub-Saharan Africa, China's increasing investment on the continent is seeing more Chinese migrate to and work in Africa than ever before, potentially bringing high-risk pork products with them upon their return. It is important to evaluate these risks in order to implement effective preventive measures to avoid an introduction of ASF.

Keywords: China, pork industry, preventive measures, risks, ASF.

Introduction

First described in Kenya by Montgomery in 1921, African Swine Fever (ASF) is a highly contagious haemorrhagic disease specific to swine. Its classification as a notifiable disease by the World Organisation for Animal Health (OIE) comes as a result of the disease having no vaccine and remaining one of the most complex viral diseases of any known animal. Emerging outside of the African Continent on only two well-documented occasions, the first saw it spread across Portugal, Spain, France, Italy, Belgium and the Netherlands from 1957 until its complete eradication in 1995, with the exemption of the Italian island of Sardinia to which the virus remains endemic. Leaving stunted pork industries and socioeconomic damages in its wake, its transcontinental spread from Angola to Portugal in 1957 came as a result of contaminated food waste from an inbound flight being fed to domestic pigs on a farm close to Lisbon airport.

Similarly, in 2007 improperly disposed of food waste containing contaminated pork from international ships brought forth the transcontinental spread of ASF to Georgia (Food and Agriculture Organization of the United Nations; FAO, 2008), subsequently giving birth to today's endemic statuses within the Caucasus, Russian Federation (RF), and Eastern Europe. Control measures put in place by the European Commission in an attempt to contain the virus have to date failed, leaving more countries endemic to the virus today than ever before. The aim of this paper is to provide an observational analysis of whether China is at greater risk now, to an ASF introduction than ever before; comparing the risks posed by both the endemic regions of Eurasia and of China's emerging trade partners in Africa. China stands currently as the both world's largest pork producer and consumer, having produced an estimated 51.9 million tons and consumed 54.6 million tons in 2016 (USDA, 2016). The 445 million head pork industry in China is left highly susceptible to socio-economic damage in the wake of a pig health crisis.

Materials and methods

Statistical data was obtained from reliable sources such as Food and Agriculture Organization of the United Nations Statistical Databases (FAOSTAT), OIE, United Nations Comtrade Data as well as (to the best of my knowledge) respectable publications by Wharton Business School and the China-Africa Research Initiative Risk values were sourced from preliminary qualitative analysis of the risk of ASF introduction to China (China-Africa Research Initiative; CARI, 2015; Sánchez-Vizcaíno, Mur, Sánchez-Matamoros, y Martínez-López, 2014).

Results and discussion

ASF Routes of Transmission

Direct transmission: this involves the transmission of the virus between an infected animal and a healthy one through direct contact. This being the primary route of transmission in Eurasia.

Indirect Transmission: whereby contaminated pork products and fomites such as farm equipment, clothing, vehicles, trailers and bedding materials as well as swill feeding practices facilitate the indirect transmission of the virus from an infected animal to a healthy one.

Biological vector: an animal, usually an arthropod, through which the virus is carried and transferred from one host to another. In the case of ASF, this involves soft shell ticks of the *Ornithodoros* genus. This paper however, will focus mainly on direct and indirect transmission routes as no evidence supports the role of ticks in the circulation of ASF in endemic regions of Eurasia. Additionally, ticks are not known to be found on pork products or transportation fomites, nor feed for long enough to be of any introductory risk to China from Africa at this time.

Wild Boar

Wild boar continue to be the main protagonists of ASF circulation in Eastern Europe, the Caucasus and the RF. Facilitating the spread of ASF through direct contact; wild boar are considered to pose a moderate risk to China. While the distance between the current areas of disease outbreak and endemicity are vast, somewhat 5000 km from China it is important to remember that the virus, nor wild boar recognise manmade borders and with much of the land stretching from the RF into China sharing a degree of habitat suitability for wild boar; the threat they pose to an ASF introduction should not be ignored.

Legal Importation of Pork Products

The increasing population in China is putting ever greater stress on the demand for meat and meat products. As a result, Chinese pork imports increased by 3% in 2016 compared to the previous year making it upwards of 1.3 million tons in order to supply the demand (USDA, 2016). While China looks towards countries such as Brazil, the UK and Canada for high-quality pork, cheaper, low-quality pork imports such as offal remain popular; posing a moderate risk to ASF introduction, for example more than 840 million kilograms of pig products, largely offal, was imported from 14 different countries in 2014 (FAOSTAT, 2014). The high risk associated with the equally high volume and frequency of low quality, cheap pork products along with their countries of origin (rumoured to include 'ASF free regions of the RF and Eastern Europe) raise some of the most worry-

ing concerns surrounding the biosecurity of China's pork industry.

Illegal Importation / Entrance of Pork Products

Focussing more specifically on illegal imports bound for personal consumption, Chinese residents in ASF affected countries were found to pose a high risk of introducing ASF to China. Chinese companies have invested increasing amounts in Africa, from \$7bn in 2008 to over \$26bn in 2013 (Wharton, 2016) and exchanged \$103bn in goods in 2015 (UNComtrade Data, 2017). Approximately 252,000 Chinese workers resided in Africa by the end of 2014 (CARI, 2015) most of them doing so in countries considered a high-risk source of ASF infection, such as South Africa, Zambia, Nigeria, and Kenya to name a few (World Organisation for Animal Health; OIE, 2017). Current estimates suggest there to be over 1 million Chinese migrants in Africa (unofficial sources). With these dramatic migration and trade work movements, it can be said the frequency of people moving between China and the continent of Africa has too increased and should reflect an even greater risk. While there is no way of knowing the true quantity of pork illegally traded across Chinese borders or carried by tourists, it will always remain an area of risk and threat to China's ASF free status.

Transport Fomites

At this moment in time, the vast distance between the endemic regions of Eurasia and China remain large enough for transport fomites such as trucks, to pose a low risk of ASF introduction. Planes, however, were found to present a moderate risk of introducing ASF to China through the possible use of and incorrect disposing of food waste containing contaminated pork. An example of such spread being the introduction of ASF to Portugal in 1957. Furthermore, ships were found to pose a high risk for much of the same reason as planes, the densely populated areas surrounding many of the shipping ports in China could provide the perfect conditions for the exposure of a healthy pig to contaminated food waste from ships returning from Africa. Lessons ought to be learnt from the transcontinental introduction of ASF to Georgia in 2007.

Conclusion

China's greatest threat of an ASF introduction originating from Eastern Europe or the RF lies with imports and trade of cheap, low-quality pork products from multiple or poorly documented origins, filling in where supply cannot meet demand. Additionally, the increasing number and frequency of Chinese tradesmen and migrants, not to mention tourists, in Africa are shown to present a very real danger to

biosecurity upon their return to China. The illegal entrance of pork products from endemic sources in Africa for personal consumption as well as the reckless disposal of food waste from returning ships and planes exposes the often overlooked risks of introduction from Africa. Having highlighted these sources of concern, we believe Africa to be the greatest threat to China's ASF free status. It would be of great value to further investigate and update the sources of information in partnership with improved data collection regarding the quantity, frequency and classification of goods as well as people moving between China and the continent of Africa, thus creating a more reliable picture for the appropriate control and surveillance measures to be applied in China and for their possible extension to other countries such as the United States.

References

- China-Africa Research Initiative (CARI). (2015). *Data: Chinese Contracts and Workers in Africa*. China Africa Research Initiative. Recuperado de <http://www.sais-cari.org/data-chinese-workers-in-africa/>
- Food and Agriculture Organization of the United Nations (FAO) (2008). African swine fever in the Caucasus. *EMPRES WATCH*. Retrieved from <http://www.fao.org/3/a-aj214e.pdf>
- Food and Agriculture Organization of the United Nations Statistical Databases (FAOSTAT) (2017). Food and agriculture [Data domains]. Retrieved from <http://www.fao.org/faostat/en/#home>
- Sánchez-Vizcaíno, J. M., Mur, L., Sánchez-Matamoros, A., & Martínez-López, B. (2014). African swine fever: challenges and measures to prevent its spread. *Paper presented at the OIE World Assembly, 82nd General Session*. Paris, France. Retrieved from <https://www.oie.int/doc/ged/D13786.PDF>
- United Nations (2017). *UN Comtrade: International Trade Statistics* [Database]. Retrieved from <https://comtrade.un.org/data/>
- United States Department of Agriculture, Foreign Agricultural services (USDA). (2016). Peoples Republic of China - Livestock and Products Semi-annual China's Pork Imports to Increase in 2016 (CH16026). Retrieved from GAIN Report website: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Livestock%20and%20Products%20Semi-annual_Beijing_China%20-%20Peoples%20Republic%20of_4-5-2016.pdf
- World Organisation for Animal Health (OIE) (2017). *World Animal Health Information (WAHIS) Database* [Database interface]. Retrieved from http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home
- Wharton Business School University of Pennsylvania (Wharton). (2016). China's Investments in Africa: What's the Real Story? *Knowledge@Wharton*. Retrieved from <http://knowledge.wharton.upenn.edu/article/chinas-investments-in-africa-whats-the-real-story/>