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The Growing Animal Health Crisis of Pork in China

Over the past few decades, the pork industry has been battling the spread of the African Swine Fever (ASF) across the globe. Originated in sub-Saharan Africa in the early 1900s, this disease is considered a Transboundary Animal Disease. According to the Food and Agricultural Organization of the United Nations, this is a “highly contagious epidemic diseases that can spread extremely rapidly, irrespective of national borders. They cause high rates of death and disease in animals, thereby having serious socio-economic and sometimes public health consequences while constituting a constant threat to the livelihood of livestock farmers”. Specifically, the African Swine Fever is a disease only transferable to pigs and wild boar, which currently has no vaccine and has a 100% mortality rate, making containment the only choice in disease control (FAO). Breakouts in Eastern Europe have been reported over ten years ago in countries such as Georgia, Ukraine, and Poland, however, they have prevented mass spread through strict compliance to government intervention plans (Jurado et al).

Recently, however, the African Swine Fever has reached China, the world’s biggest consumer and producer of pork. Since the first known case in China broke out on August 3rd of 2018, Chinese pig farms across the country have been struggling to control the spread of this fatal disease (Ministry of Agriculture and Rural Affairs of the People’s Republic of China). Within a year, this disease has spread to all provinces and beyond Chinese borders to six neighboring Southeast Asian countries, including Vietnam, Cambodia, and Thailand. Decimating the population of pigs, this disease is estimated to kill 150 to 250 million out of the 360 million pigs in China (McLaughlin). Without proper and timely disease management, the African Swine Fever will continue to raise the price of pork and threaten the world’s supply of pork.

China, located in East Asia, is home to 56 ethnic groups. Spanning 9,596,961 square kilometers, China has a diverse climate ranging from tropical in south to subarctic in the north. As of 2018, China is the most populous country in the world, with a population of 1.3 billion people (The World Factbook: China). China continues to operate under a one-party Communist rule under current president Xi Jinping. Since the economic opening of China in 1978, China has shifted from a planned economy to a market-based economy, sparking massive economic growth and social change. China has seen massive changes to its economic structure, booming into an economic powerhouse, housing the second largest economy in the world. Over the past 25 years, 850 million people have lifted themselves out of poverty and China has maintained an average of a 10 percent increase in GDP per capita per year (World Bank). Though China has seen quick growth, the average GDP per capita still remains similar to other developing countries of 59,660 yuan (approx. 8,600 USD) and an estimated 373.1 million people still live in poverty \$5.50 USD per day (World Bank).

Not only is China changing economically, but China is also changing socially. 59.2 percent of China’s total population is living in an urban area, with a 2.42 percent annual increase in the rate of urbanization (The World Factbook: China). In search of jobs, young people are increasingly leaving rural farming areas, where the only source of income is through agriculture, to work in big cities such as Shenzhen and Guangzhou. While there are stark differences in the lives of those living in urban and rural areas, the same familial values hold for most Chinese families. Traditional Confucian values still hold true, where living

under one household with extended family is encouraged. Though this tradition is typically practiced more often in rural areas, it is also fairly common in urban areas too. The typical Chinese household consists of 3.4 family members, and 18.9 percent of households include three or more generations. 95 percent of Chinese families have access to universal government health care and 96.4 percent of the population is literate with the average schooling time spanning 14 years (The World Factbook).

The typical Chinese meal is eaten family-style consisting of rice, with various meat and vegetable dishes to eat alongside the main starch. Pork is typically the main meat in these rice accompanying dishes and is an essential meat source in a typical Chinese diet, where meat is eaten for almost every meal. Pork is the most consumed animal protein in China, where it accounts for 66 percent of all meat consumption, including beef and poultry (Schneider and Shefali). Not only is pork eaten on a daily basis in China but pigs themselves also carry cultural significance. Pigs symbolize prosperity and wealth in Chinese culture, and it is common for whole roasted pigs to be showcased as the main dish during special occasions and holidays such as weddings and Chinese New Year.

Most Chinese families will shop at local markets to buy fresh produce and meat every day to cook at home. Only about 10 percent of China's total land area is used for agricultural and animal farming, and of this, "slightly more than half is unirrigated, and the remainder is divided roughly equally between paddy fields and irrigated areas." (Britannica). Unlike the United States, China does not have major industrial livestock farming companies that account for a majority of meat production. Instead, a majority of livestock is raised on small family farms, "where 98% of the farms in China have fewer than 50 animals each, and they account for about a third of the production in the country" (UPenn).

As the socioeconomic status of China continues to change, the consumption patterns for pork will also change. In 2000, just 4 percent of the urban population was considered middle class, but by 2022, 76 percent of China's urban population will be considered middle class (Iskyan). As China is becoming more economically developed, the demand for pork has been on the rise as incomes increase in urban and rural areas. According to a report by the Institute for Agriculture and Trade Policy (IATP), the average Chinese citizen increased meat consumption from a mere 8 kilograms of pork per year to about 39 kilograms of pork a year, while Americans eat only 27 kilograms. To meet the Chinese demand for pork, imports are heavily relied on from countries such as the United States and Canada. And global pork supplies are estimated to decrease by 8 percent (Ellis-Petersen).

However, increasing livestock production to fit the growing needs of China is not possible without the proper disease prevention mechanisms in livestock farms. Currently, the depletion of swine populations due to the African Swine Fever is already increasing pork prices by 40 percent in China, threatening consumers especially living in rural areas with low incomes, that will not have access to pork if prices climb higher (Ellis-Petersen). Declining swine populations have also affected affiliated economies such as American soybean crops, the main ingredient of Chinese swine feed. As more pigs are being culled (slaughtered), the demand for soybeans has drastically decreased. Pork not only serves as a traditional, affordable protein source, but it also serves as a source of income for small farming families living in rural areas. This deadly disease is putting the diets and incomes of China's more vulnerable, rural citizens at stake, negatively affecting their daily lives.

Under current conditions, stopping the spread of this disease will be an enormous challenge due to the enormous scale of swine farming in China and the complexity of the disease. In order to effectively

prevent the further destruction of the swine population in China, the disease itself must be thoroughly understood.

The African Swine Fever is a deadly immune system crippling disease that attacks the pig, showcasing full symptoms after 5-7 weeks. It can be caught among other pigs through contaminated bodily fluids, making it incredibly easy to accidentally spread (United States Department of Agriculture). Leading ASF researcher, Megan Niederwerder of Kansas State University, states that “ASFV is one of the hardy or robust viruses in pH extremes as well as temperature extremes, so it can survive for sustained periods and maintain its infectivity in various environmental conditions.” This has allowed for the spread of this disease to cross borders in China, primarily through smuggled contaminated raw meat, on the clothing and vehicles of travelers, the improper feeding of uncooked garbage that contains infected pork product, and through ticks on other animals crossing the border (United States Department of Agriculture).

China has currently invested 15 million USD in research and development for a new vaccine, though progress is not quick enough to keep up with the spread and multiple variations of the disease. Although some progress with the vaccine is being made, time is running out as the number of culled pigs has already reached 1.2 million (Zimmer). Many top researchers on ASF have cited that vaccines and increased government biosafety practices are simply not enough to curb the spread and interdisciplinary methods should be introduced.

This problem has massively grown in part to the small pork-producing backyard farms sprawled across China. Though China is moving towards more industrialized animal farming practices adopted from Western countries, these farms still lack basic biosecurity measures. The understandable desire not to report diseased animals by small family farms coupled with their need to minimize losses creates a breeding ground for the disease to spread. According to the Food and Agricultural Organization (FAO) of the United Nations, “Control of swine diseases has been dominated by private-sector initiatives, and much of the research focuses on diseases affecting the commercial sector. But less has been done to reduce the burden of poverty-related diseases such as cysticercosis or African swine fever, despite their relevance for food security and the public health sector. There is a need for more joint public and private investments in pig health that are balanced and that take all stakeholders into account.”

My plan of action is to combine efforts through three initiatives: education and spreading public awareness of the disease, increasing biosecurity practices on small family farms through farmer to farmer management, and offering government-funded incentives to farmers that follow safety protocol.

The Chinese government needs to extensively work with the Food and Agriculture Organization (FAO) of the United Nations and their sub-organization, Emergency Centre for Transboundary Animal Diseases (ECTAD), to successfully contain the disease as quickly and effectively as possible. I hope that the Chinese government can adopt similar methods to curb the disease similar to the methods used by European Balkan countries, where the disease has been present for about 10 years.

Similar challenges have been met in the Balkans, where the government worked exclusively with the AFO to create and hand out pamphlets and manuals. This has great potential to work and be implemented in China due to the high levels of rural family farms in both countries. African Swine Flu specific biosafety manuals such as, “Good Practices for Biosecurity in the Pig Sector” and “Manual on African Swine Fever for pig producers” have already been created by FAO Animal production and health branch

and easily be translated into Mandarin Chinese with the help of the existing Chinese branch of the FAO. Using pamphlets and manuals can help reach more rural areas, making them aware of the different feeding protocols and instructing them not to feed pigs human food scraps. Educating pig farmers about the disease and how to spot the early signs are crucial in order for farmers to cut their losses early and prevent it from spreading to other farmers. Educate the rural farmers on the severity of this disease and its possible global impact on pork if not managed correctly. strict quarantine and biosecurity, animal movement restrictions, and the proper culling (slaughtering) of infected/exposed animals.

Through grassroots volunteer systems to spread information, basic biosecurity can be reached, giving the potential to stop the disease from spreading further. As of right now, government officials are the main ones doing the culling and teaching, but we can do this using volunteer-based methods of teaching from farmer to farmer. Currently, Chinese government officials working with the Ministry of Agriculture and Rural Affairs (MARA) of the People's Republic of China have been mass culling pigs that have been in a contaminated herd, totaling to about 1.2 million pigs. The efficiency of these mass cullings can be undermined if there is a lack of effective education to go along with the cullings. No matter the scale of the farm, every site can have an appointed biosecurity manager. That manager will be responsible for educating other workers and about the disease-specific biosecurity plans. With this designated role, keeping track of visitors and possible contaminants will be possible. This knowledge can be sustained and passed down to the future generations in the family and can also extend to possible future breakouts among livestock.

The Chinese government agency MARA can offer incentives to pig farmers to report an infection or outbreak in order to receive livestock insurance payouts and create public recognitions/awards if the farmers have taken proper safety precautions in raising the pigs. They can also increase putative fines towards farmers who have knowingly sold their infected pigs to other farmers or public consumers, or if they bribed officials to get a passing grade on the inspection of their farms and animals.

Pigs play an integral role in Chinese society, acting as a sign of prosperity and as a traditional food and income source. With the increasing demand for pork from China, the world's largest producer and consumer, the industry cannot be sustained under the spread of the African Swine Fever. This disease had already posted a disruption to the global economy, raising questions on trade and prices, affecting everyone from large industrial producers to small rural farmers. With the help of Chinese government cooperation and specific UN special counsels, such as the Food and Agriculture Organization of the United Nations (FAO) and the Emergency Centre for Transboundary Animal Diseases (ECTAD), education on the proper way to handle the spread of this disease can be spread from government officials to rural farmers, areas where the disease is more likely to be spread. With the combined efforts of public awareness through manuals, farmer to farmer checking methods, and farming incentives based on already successful protocol existing in agriculturally similar countries, we can slow down the African Swine Fever epidemic enough to find a more permanent cure.

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