Title: Emerging Issues: Ebola

Principal Investigator: Amy Kircher, University of Minnesota-Twin Cities
Center of Excellence: Food Protection and Defense Institute (FPDI) (Emeritus)
COE Lead/Co-Lead Institution: University of Minnesota

Project Start Date: 11/2014
Project Completion Date: 02/2015
Project Status: Complete
Research Theme: Risk Analysis
Participating State(s): Minnesota, New York
Amount Awarded to Date: $44,768
Award Number: 2010-ST-061-FD0001

Abstract: The world's largest and longest outbreak of Ebola currently ongoing in West Africa presents a potential threat to the United States. In the context of Ebola, the threat of contaminated food commodities entering the United States and the risk of human infection via consumption of contaminated food and / or human exposure via wildlife species or bushmeat, are challenging to quantify. Wildlife species including bats, non-human primates, forest antelope and rodents are known to be susceptible to Ebola virus infection, with large African fruit bats being the putative virus reservoir. The likelihood of a human being inside the United States becoming infected with Ebola virus via a contaminated food commodity or directly from imported wildlife or bushmeat originating in one of the West African outbreak affected countries was assessed. The Ebola outbreak in West Africa also threatens to disrupt the production and global trade of commodities produced in the region. This disruption could lead to second order effects in the food system such as an increased risk of economically motivated adulteration (EMA). Given this risk, we also performed an assessment of potential EMA vulnerability in West African food commodities, primarily cocoa, as a result of the Ebola outbreak.

Project Type: Research
End User Engagement:
- Academic Community
- DHS Office of Health Affairs
- Food and Agriculture Industries

Executive Summary (2015): The world’s largest and longest outbreak of Ebola currently ongoing in West Africa presents a potential threat to the United States. In an interconnected and interdependent global economy - where people, animals and products move across the world in a single day - the risk of Ebola to the United States is a combination of; 1) the biological threat of the virus itself, 2) the consequences of potential disease transmission to human health and global trade, and 3) public perception and fear associated with a hemorrhagic disease surrounded by uncertainty. In the context of Ebola, the threat of contaminated food commodities entering the United States and the risk of human infection via consumption of contaminated food and / or human exposure via wildlife species or bushmeat, are challenging to quantify. Wildlife species including bats, non-human primates, forest antelope and rodents are known to be susceptible to Ebola virus infection, with large African fruit bats being the putative virus reservoir. The likelihood of a human being inside the United States becoming infected with Ebola virus via a contaminated food commodity or directly from imported wildlife or bushmeat originating in one of the West African outbreak affected countries was assessed. The Ebola outbreak in West Africa also threatens to disrupt the production and global trade of commodities...
produced in the region. This disruption could lead to second order effects in the food system such as an increased risk of economically motivated adulteration (EMA). Given this risk, we also performed an assessment of potential EMA vulnerability in West African food commodities, primarily cocoa, as a result of the Ebola outbreak. For three major West African food commodity exports (cocoa, palm oil, and cashew nuts), we identified negligible to low risk of human infection in the US from handling these products. In regards to wildlife species and products derived from them, transported into the US through declared legal channels, there is low to medium risk of human infection. Most importantly, we identify high risk of human infection from unregulated, illegal imports of bushmeat intended for direct human consumption in the US, along with data indicating such illegal imports already occur - and are being intercepted at some rate less than 100%. Our findings indicate transmission of Ebola from affected West African countries into the United States is a low probability but very high consequence event. The analysis showing significant amounts of potential pathogen carrying, illegal bushmeat being intercepted at US borders warrants further investigation and urgent implementation of additional risk mitigation measures to address the very real threat of Ebola infection. Our analysis of EMA vulnerability examined the individual contributing factors that could lead to EMA of cocoa from West Africa (i.e. supply chain characteristics, geopolitical considerations, fraud history). We determined that the overall EMA vulnerability score to be medium-low to medium, depending on the relative importance of each factor.

Peer-reviewed journal articles produced from this project

<table>
<thead>
<tr>
<th>Citation</th>
</tr>
</thead>
</table>

Contact Information:

Food Protection and Defense Institute
University of Minnesota - Twin Cities
R285 LES Bldg
St. Paul, MN 55108
612-624-2458
fpdi@umn.edu

© 2018 Homeland Security University Programs. All rights reserved.