

Examining Pathogen-Based Import Refusals: Trends and Analysis From 2002 to 2019

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What Is the Issue?

In the interest of public health, it is important to understand and minimize possible foodborne illness risks to U.S. consumers from foreign food products. One possible risk is that food may be contaminated with pathogens (bacteria, viruses, or other disease-causing microorganisms) or toxins (mostly produced by microorganisms). While data capable of estimating the risk of foodborne illness from foreign producers is limited, U.S. import refusal data list the most common reasons why foreign shipments were refused. Previous ERS reports presented 7 to 9 years of records of import refusals, which was a relatively short period to reveal trends. The most recent previous report examined data up to 2013. Previous USDA, ERS reports showed adulteration and misbranding violations in aggregate, but possible foodborne illness risks more likely resulted from pathogen violations.

This report examines changes in imported shipments that were refused due to pathogen/toxin violations using FDA data from the Operational and Administrative System for Import Support (OASIS) database from 2002 to 2019.



What Did the Study Find?

Overall pathogen/toxin prevalence in refusals

- From 2002 to 2019, *Salmonella* violations accounted for 79.8 percent of pathogen/toxin violations, followed by *Listeria* at 11 percent, histamine at 3.6 percent, aflatoxin at 3 percent, and other bacteria at 2 percent. All remaining pathogen types accounted for 0.6 percent of pathogen/toxin violations.
- Annually, the number of violations for *Salmonella* peaked in 2011, then declined. The number of violations for *Listeria* declined from 2003 until 2008 but was volatile with a slight downward trend since 2010.
- Compared to the previous ERS report, the share of *Salmonella* violations increased from 63 percent from 1998–2004 to 79.8 percent over 2002–19. *Listeria* violations decreased from 24.8 percent to 11 percent.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

Refusals by food industry group

- From 2002 to 2019, most pathogen/toxin violations occurred in fishery and seafood products (44.1 percent); followed by spices, flavors, and salts (26.3 percent); cheese and cheese products (7.1 percent); fruit and fruit products (6.2 percent); and nuts and edible seeds (5.1 percent). *Salmonella* was the most common type of pathogen/toxin violation for fishery and seafood products; spices, flavors, and salts; fruit and fruit products; and nuts and edible seeds. *Listeria* was the most common type of pathogen/toxin violation for cheese and cheese products.
- Annually, the number of violations for fishery and seafood products increased until 2004, decreased until 2008, increased and peaked in 2011, and decreased thereafter.
- Compared to 1998–2004, violations shifted from fishery and seafood to other products; however, fishery and seafood products continue to account for the largest share.

Refusals by country of origin

- From 2002 to 2019, India, Mexico, Vietnam, Indonesia, and France accounted for 22.9 percent, 14.9 percent, 8.6 percent, 7.8 percent, and 4.3 percent of import refusals due to pathogen/toxin violations, respectively. *Salmonella* was the most common pathogen/toxin violation for shipments from India, Mexico, Vietnam, and Indonesia. *Listeria* was the most common violation for shipments from France.
- Annually, the number of pathogen/toxin violations from India slightly increased. Those from Mexico spiked in 2003, 2008, and 2010 but remained low and stable since 2012.

However, FDA's import refusal dataset does not have detailed records for the volume of shipments inspected. Only a small percentage of shipments were examined, not randomly, based on previous history. It is also difficult to assess how screening authorities' standards changed over time. For these reasons, this report has limited understanding of which factors affected the refusals by pathogen/toxin, industry, or country.

How Was the Study Conducted?

Import refusal data is publicly available for download from 2002 to the present. Authors focused on the number of import refusals in total and annually by pathogen/toxin type, food industry group, country, and select groupings such as leading violations within industry groups. For a given year, the sum of the notable pathogens, viruses, and toxins in the OASIS database define the annual number of violations. The number of pathogen/toxin violations is defined as the sum of an annual number of violations across all years of available data. The authors further examined violations by pathogen type, industry type, and country of origin. From 2002 to 2019, 10 types of pathogen/toxin violations were reported: *Salmonella*, *Listeria*, aflatoxin, histamine, *E. coli* O157, *Shigella*, patulin, *Vibrio*, Hepatitis A, and other bacteria. These occurred in 32 food industry groups, including bakery products, dairy products, fruit and vegetables, and seafood products. The data covered in this report reflect pathogen/toxin violations in shipments from 110 countries for which at least one violation was found from 2002–19.