FARM FORWARD

August, 2026

SALMONELLA RISK IN THE U.S. POULTRY INDUSTRY:

When Infections Become More Severe and Harder to Treat

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The U.S. poultry industry and federal regulators have, for years, pointed to decreasing salmonella contamination as evidence that efforts to control salmonella are progressing. Yet USDA reports that there has been no corresponding reduction in human illness. Although USDA emphasizes reductions in the overall level of salmonella in poultry products, its public messaging gives little attention to the specific salmonella strains that persist in the food supply—strains that increasingly include some of the most dangerous-to-humans and difficult-to-treat pathogens.

While Farm Forward's first report on salmonella analyzed overall contamination rates in the poultry industry, and exposed the most contaminated slaughter and processing plants and the inability of the federal government to regulate salmonella contamination,[1] our latest investigation focuses on the changes in salmonella strains in the poultry industry from 2014 to 2025 and the danger they represent. Using USDA Food Safety and Inspection Service (FSIS) surveillance data from poultry slaughter and processing plants, this report goes beyond basic contamination metrics to evaluate the factors that most directly influence human health risk: which salmonella serotypes (strains) are circulating in the industry, how likely they are to cause severe disease, and how difficult infections may be to treat.

The findings reveal **a worsening risk profile for public health**. In our new analysis of FSIS salmonella serotype and antibiotic resistance testing data, we found that, over the last decade, **contamination with high-virulence and multidrug-resistant strains linked to invasive infection, hospitalization, and death has risen sharply and shows no indication of slowing or reversing**. In other words, while the percentage of positive salmonella tests is lower overall, a growing share of the salmonella that exists is among the most dangerous to human health.

This shift reflects not only changes in the prevalence of individual serotypes, but also the broader conditions under which poultry is produced and processed. Features of intensive poultry production—including high-density housing, rapid processing speeds, genetic uniformity that weakens birds' immune resilience, and repeated opportunities for transmission across the production system—can create conditions that favor the persistence and spread of certain high-risk serotypes. Since these serotypes rarely make the animals sick, they are the ones that are amplified and dominate over time.

1 "How the USDA & the US Poultry Industry Fail to Protect Americans from Foodborne Disease," Farm Forward, October 2025.

Our analysis found that these risks are not evenly distributed across the industry. Certain slaughter and processing plants owned by major poultry companies repeatedly emerge as centers of persistent contamination by highly virulent, antibiotic-resistant strains. This concentration challenges the argument that dangerous salmonella contamination is an unavoidable consequence of poultry production. Instead, it suggests that facility-level practices, supply-chain conditions, and regulatory oversight play an important role in determining whether high-risk pathogens persist and spread. As a result, responsibility for controlling salmonella risk cannot be placed primarily on consumers through food handling and cooking practices at home.

The persistence of these contamination hotspots also raises questions about accountability. Some companies continued to operate facilities where dangerous salmonella strains recur year after year despite ongoing monitoring, while regulatory responses have done little to eliminate the risks posed by their infrastructure and practices. The result is a food-safety system that tolerates conditions reliably generating a measurable level of ongoing exposure to highly virulent and antibiotic-resistant strains. Our findings show how these risks have evolved over time and where they are most concentrated.

Key Findings

- **Dangerous serotypes have grown to dominate in the industry, now accounting for 67.9 percent of salmonella, with no sign that this shift is reversing.**

    - The serotypes most likely to cause human illness (*Salmonella Infantis, Salmonella Enteritidis, and Salmonella Typhimurium*) have grown much more common, increasing by 43.6 percentage points since 2014 and now accounting for more than two-thirds (67.9 percent) of salmonella in the industry in 2025, up from only one-quarter of samples (25.3 percent) in 2014.

    - The *Infantis* strain has increased significantly (from 5.4 percent in 2014 to 35.7 percent in 2025), concerning public health officials due to its prevalence, its link to serious illness, and its widespread resistance to multiple antibiotics.

- **Antibiotic resistance and multidrug resistance are on the rise, now accounting for 73.3 percent of positive poultry samples.**

    - In 2025, roughly 73.3 percent of poultry samples that tested positive for salmonella were resistant to at least one antibiotic identified by the World Health Organization (WHO) as highly important for human medicine, an increase of 25.2 percentage points from 48.1 percent in 2014.

    - Multidrug resistance also showed a significant increase: 32.4 percent of positive tests were resistant to three or more antibiotic classes in 2025, up from 15.9 percent in 2014. Some poultry samples show resistance to up to ten antibiotics.

- **The serotypes most associated with human illness now carry high rates of resistance to one or more antibiotics.**
    - In 2014, only 3.2 percent of isolates of the dangerous *Enteritidis* strain were resistant to any antibiotics. By 2025, that had climbed dramatically to 70.6 percent of *Enteritidis* samples (a 67.4 percentage-point increase). In addition, 0.7 percent of positive samples were multidrug-resistant, up from 0.0 percent in 2014.
    - 94.3 percent of *Typhimurium* isolates were resistant to one or more antibiotics in 2025 (a 13.1 percentage-point increase from 81.2 percent in 2014), and 46.5 percent of positive samples were multidrug resistant, a 26.5 percentage-point increase from 20 percent in 2014.
    - 97.8 percent of *Infantis* isolates were resistant to one or more antibiotics in 2025, a 90 percent increase from 7.8 percent in 2014. 81.7 percent were multidrug resistant, a 75.8 percentage-point increase from 5.9 percent in 2014.
- **Top poultry companies showed some of the highest rates of high-virulence serotypes and antibiotic resistance. In 2025:**
    - High-virulence serotypes accounted for more than 75 percent of samples at well over a dozen of the highest-risk poultry plants, including certain plants owned by Perdue, Butterball, and Pitman Farms.
    - Plants showed alarmingly high contamination of birds by antibiotic-resistant salmonella. The worst Pitman and Butterball plants had an overall antibiotic resistance rate of more than 60 percent in positive samples, and over 90 percent of the positive samples at two of Perdue's plants showed contamination with antibiotic-resistant serotypes.
    - Multidrug resistance appeared in nearly one-fifth of positive tests at one of Butterball's plants, more than a quarter of tests at Pitman's plant, and more than one-third of tests at two of Perdue's plants.
    - Across all metrics (contamination rate, high-virulence rate, and antibiotic and multidrug resistance rates), these three companies have at least one processing plant whose samples ranked among the country's top 25 highest-risk from 2014 to 2025.

Our findings reveal that the industry's problem is no longer just generic salmonella contamination. Increasingly, the strains dominating poultry production are among the most severe human pathogens and among the most difficult to treat when infection occurs. The persistence and continued growth of these strains suggest that the industry's salmonella problem is becoming more dangerous, not less.

These dynamics point to a broader system in which production conditions, not only individual plant performance, determine the persistence and evolution of high-risk pathogens.

The consequences extend far beyond individual cases of food poisoning. Every year that multidrug-resistant salmonella circulates through poultry production systems, the industry erodes the effectiveness of antibiotics that remain critical for human medicine. The continued spread of these strains increases the risk not only of illness, hospitalization, and death from salmonella, but also of salmonella's resistance spreading more broadly to other bacterial pathogens. The stakes of antibiotic resistance cannot be overstated: As bacteria develop resistance to antibiotics, treatment options narrow, leading rapidly to what the World Health Organization (WHO) has characterized as a post-antibiotic era, where many common injuries and illnesses that have been easily treated since the advent of antibiotics—a scraped knee, strep throat, a urinary tract infection, an ear infection—again become potentially life-threatening.

To assess the compounding risk emerging from the poultry industry, this report examines trends in high-virulence, antibiotic-resistant serotypes in poultry production, how the industry and current regulatory systems have failed to contain these dangerous pathogens, and which companies and facilities are driving some of the highest-risk contamination patterns.

INTRODUCTION

AJ was 10 years old when he became seriously ill after eating contaminated chicken. His parents initially thought he had a cold, but his condition quickly worsened. He was admitted to the hospital with a bloodstream infection. Doctors eventually identified the cause: multidrug-resistant *Salmonella Heidelberg* linked to contaminated poultry. AJ was one of 634 confirmed cases of illness in a multistate outbreak tied to chicken products. Dozens required hospitalization. Fortunately for AJ, doctors were still able to find antibiotics that worked. After intensive treatment, AJ recovered and returned home to his family.[2]

Arthur Sutton was not as fortunate. Shortly after eating contaminated chicken at his 70th birthday celebration, Arthur became violently ill and was rushed to the hospital. Doctors identified multidrug-resistant *Salmonella Infantis* as the cause of his infection. They treated him with one antibiotic, then the next, and the next. None worked. His condition deteriorated rapidly as he developed septic shock and organ failure. Two weeks later, he died from complications related to the infection. He left behind his longtime partner, Marva. Later, investigators linked his illness to a multistate outbreak associated with contaminated chicken products.[3]

AJ's and Arthur's cases illustrate the growing public health threat posed by antibiotic-resistant salmonella. Most infections cause diarrhea, fever, and vomiting,[4] and resolve without antibiotics. But in young children, older adults, immunocompromised individuals, and severe cases involving bloodstream or systemic infection, antibiotics can make the difference between life and death. When salmonella becomes resistant to those drugs, infections become more difficult—and sometimes impossible—to treat.

Antibiotic resistance is now recognized as one of the most serious threats to global public health.[5] Most people may view antibiotic resistance an abstract or distant problem, or may not consider it at all. However, the life-and-death consequences of antibiotic resistance could affect any person at any time in any place around the globe. As bacteria develop resistance to critical antibiotics, the likelihood of untreatable bacterial infections increases. Even common infections could become life-threatening, including but not limited to salmonella.

2 "AJ's Story: Salmonella Illness Linked to Chicken," Centers for Disease Control (CDC), September 18, 2025.

3 Bernice Yeung et al., "America's Food Safety System Failed to Stop a Salmonella Epidemic. It's Still Making People Sick," *ProPublica*, October 29, 2021.

4 "Salmonella Infection," Mayo Clinic, accessed June 10, 2026.

5 "Antibiotic Resistance Threats in the United States 2019," CDC, 2019; "Antimicrobial Resistance: Key Facts," World Health Organization (WHO), 2021.

In the poultry industry, the threat of antibiotic resistance is increasingly concentrated in salmonella strains—like *Salmonella Infantis* and *Enteritidis*—that are both highly virulent to people (those most likely to make people severely sick) and resistant to multiple antibiotics. Some isolates (individual bacterial samples collected from poultry products) identified in federal surveillance data show resistance to up to ten antibiotics that the World Health Organization (WHO) classifies as highly important for human medicine.

Salmonella infections from poultry account for 25 percent of all human salmonella illnesses.[6] Given poultry's substantial contribution to human illness, one might expect that reducing salmonella contamination in poultry would lead to a corresponding decline in infections. However, that expectation assumes that all salmonella pose the same threat. In reality, public health risk depends not only on whether salmonella is present, but also on the virulence of the circulating serotypes and the extent of antibiotic resistance in those strains. As a result, changes in overall contamination do not necessarily reflect changes in public health risk if the characteristics of the remaining strains are also changing.

This distinction helps explain an otherwise puzzling trend. Although salmonella contamination in poultry *has* declined in recent years, USDA reports that overall human salmonella illnesses have remained largely unchanged.[7] Our analysis of Food Safety and Inspection Service (FSIS) data from 2014 to 2025 shows that focusing on contamination levels alone obscures important changes in the characteristics of the bacteria that persist.[8]

While overall contamination rates have fallen since 2014 (the earliest publicly available FSIS dataset with serotype data), rates of antibiotic resistance and multidrug resistance remain high, and high-virulence serotypes most associated with human illness have become increasingly dominant within the industry. The result is that the pathogens that persist are more difficult to treat and pose a greater risk to consumers.

This trend is directly influenced by the structure of industrial poultry production, specifically, antibiotic use practices in industrial animal agriculture. Of all antibiotics classified by the WHO as important for human medicine, the industrial animal sector purchases *66 percent* of these essential drugs, meaning that *most* crucial human antibiotics are being diverted for use in animals rather than people. These drugs are frequently administered routinely in low doses to compensate for crowded and stressful production conditions that facilitate disease spread: high-confinement housing, rapid

6 "Exploring Practical Strategies To Reduce Salmonella in Poultry Products," USDA FSIS, December 2, 2025. Salmonella infections occur in backyard poultry in addition to commercial poultry, but the number of cases in backyard poultry is comparatively very low; out of the total number of cases linked to poultry each year (337,500), backyard poultry outbreaks accounted for 1,230 confirmed cases in 2022, 1,072 in 2023, and 470 in 2023. "Salmonella Outbreak Linked to Backyard Poultry - June 2022," CDC, November 10, 2022; "Salmonella Outbreak Linked to Backyard Poultry - May 2023," CDC, September 9, 2024; "Salmonella Outbreak Linked to Backyard Poultry -May 2024," CDC, October 22, 2024.

7 "Proposed Regulatory Framework to Reduce Salmonella Illnesses Attributable to Poultry," USDA FSIS, accessed October 1, 2025.

8 "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

production cycles, genetic uniformity that weakens birds' immune resilience, high-speed slaughter, and repeated opportunities for disease transmission.[9] These characteristics of industrial poultry production, combined with regular, subtherapeutic administration of antibiotics to the entire flock, create ideal conditions for the evolution and persistence of antibiotic-resistant bacteria.

Once resistance emerges, salmonella strains can spread throughout farms and processing facilities and exchange resistance traits with other bacteria, compounding the threat to human health. For decades, the WHO has cautioned that antibiotic use in farmed animals is highly concerning because of its contribution to the antibiotic resistance that undermines the effectiveness of life-saving drugs in human medicine.[10]

Despite calls to act swiftly to reduce the overapplication of antibiotics in agriculture, in 2024, purchases of antibiotics for use in animals raised for meat, dairy, and eggs surged, increasing 16 percent from 2023.[11] At a time when the industrial animal sector can and should reduce antibiotic use, instead it maintains the very practices that continue to drive the global antibiotic resistance crisis and endanger public health.

The poultry industry has long argued that salmonella contamination is unavoidable, and that preventing illness is primarily the responsibility of consumers through proper food handling and cooking. But persistent contamination with highly virulent, multidrug-resistant salmonella is not inevitable. It is enabled by production systems and regulatory approaches that allow pathogens dangerous to humans to emerge, persist, and spread within the poultry supply chain. Below, we examine how virulent and multidrug-resistant salmonella strains have changed within the U.S. poultry industry from 2014 to 2025, and what those trends reveal about the growing threat to public health.

FSIS surveillance data show that these serotypes are not evenly distributed across the industry. For instance, some plants may have lower levels of contamination with high rates of high-virulence, multidrug-resistant strains, while others may be highly contaminated with serotypes more likely to cause illness in people. The result is a system in which average contamination levels appear to improve, while the remaining pathogens pose an increasingly serious threat to public health.

9 David Wallinga et al., "A Review of the Effectiveness of Current US Policies on Antimicrobial Use in Meat and Poultry Production," *Current Environmental Health Reports* 9, no. 2 (2022): 339-354.

10 "Stop Using Antibiotics in Healthy Animals to Prevent the Spread of Antibiotic Resistance," WHO, November 7, 2017; Xu C et al., "A Review of Current Bacterial Resistance to Antibiotics in Food Animals," *Frontiers in Microbiology* 13 (2022): 822689.

11 "2024 Summary Report On Antimicrobials Sold or Distributed for Use in Food-Producing Animals," U.S. Food and Drug Administration (FDA), 2024.

BACKGROUND

The Public Health Burden of Salmonella in the U.S. Poultry Industry

Salmonella is one of the most prevalent foodborne illnesses in the United States, annually infecting 1.28 million people and leading to 12,500 hospitalizations. It is also the leading cause of death from foodborne illness, resulting in 238 deaths each year.[12]

Most of these infections and hospitalizations are caused by eating contaminated food.[13] Animal-based foods (chicken, turkey, pork, eggs, beef, dairy, and seafood) are some of the most commonly contaminated foods, followed by fruits and vegetables contaminated with farmed animal manure, wildlife scat, or adulterated water.[14] Salmonella is now considered endemic to animal agriculture globally,[15] contributing to the industry's "infectious disease trap," where high-density confinement housing, poor waste management, and unsanitary practices create breeding grounds for zoonotic diseases.[16] These conditions are core characteristics of industrial animal production at scale, promoting the persistence and circulation of pathogens across the supply chain, where salmonella has the ability to "survive for long periods in feed, litter, and the environment, increasing the risk of future outbreaks."[17] Consequently, features common to intensive poultry production—such as high stocking densities, limited genetic diversity, rapid production cycles, and complex supply chains—can increase opportunities for salmonella introduction, amplification, and transmission.[18] The extent to which these risks materialize varies across producers and facilities, suggesting that management practices and regulatory oversight influence whether dangerous strains persist.

Chicken and turkey meats alone account for 25 percent of all salmonella illnesses[19] (or 320,000 cases each year), and the Centers for Disease Control and Prevention (CDC) estimates that "1 in every 25 packages of chicken at the grocery store are contaminated with salmonella."[20] However, in a recent study by Consumer Reports, researchers found that the number is likely much higher: one-third of samples of ground chicken they tested from grocery stores across the country were contaminated with salmonella, and more than one-third of those were from Perdue (one of the

12 "Estimates: Burden of Foodborne Illness in the United States," CDC, March 19, 2025.

13 "Estimates: Burden of Foodborne Illness," CDC.

14 "Salmonella (non-typhoidal)," WHO, February 20, 2018.

15 S. Shaji, R.K. Selvaraj, R. Shanmugasundaram,"Salmonella Infection in Poultry: A Review on the Pathogen and Control Strategies," *Microorganisms* 11, no. 11 (2023): 2814.

16 Matthew N. Hayek, "The Infectious Disease Trap of Animal Agriculture," *Scientific Advances* 8, no. 44 (2022).

17 L. Kovács, et al., "Biosecurity Implications, Transmission Routes and Modes of Economically Important Diseases in Domestic Fowl and Turkey," *Veterinary Sciences* 12, no. 391 (2025).

18 L. Kovács, et al., "Biosecurity Implications."

19 "Exploring Practical Strategies," USDA FSIS.

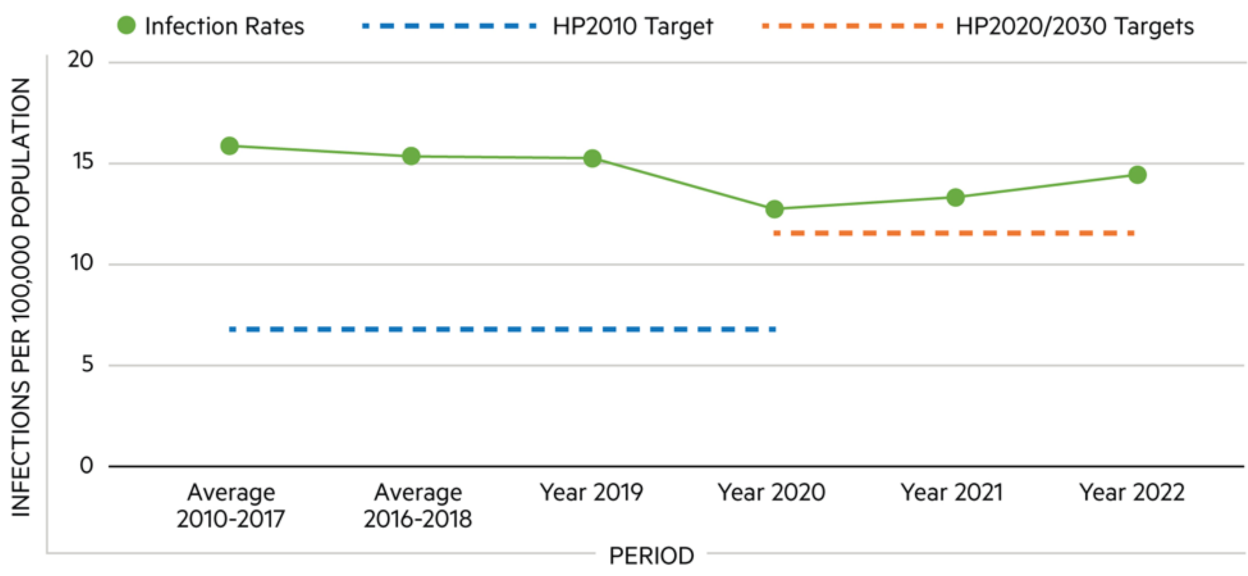
20 "Chicken and Food Poisoning," CDC, April 29, 2024.

top chicken companies in the country).[21] More concerningly, 91 percent of those samples tested positive for one of the three salmonella strains found in poultry that FSIS and the CDC have identified as "serotypes of concern" because of the threat they present to human health (*Infantis*, *Typhimurium*, and *Enteritidis*), and all identified strains were resistant to one or more antibiotics important to human medicine.[22] These findings align with broader surveillance data showing that risk is concentrated in a relatively small number of serotypes that are consistently selected for and maintained within industrial production environments.

Given the high percentage of salmonella outbreaks originating in poultry, controlling the emergence and spread of this pathogen is critical for protecting public health. The federal government is charged with regulating and monitoring the industry's progress in addressing the dangers of salmonella contamination in the food system.

Every decade, the Department of Health and Human Services' Healthy People initiative sets goals for reducing overall salmonella infections among Americans. However, the two most recent salmonella targets (for 2010 and 2020) were not met (see Figure 1).[23] In

Figure 1. Healthy People Targets vs. National Infection Rates (2010–2022)



Source: Healthy People 2030, "Reduce infections caused by Salmonella — FS-04," accessed June 12, 2026; USDA FSIS, "Proposed Regulatory Framework to Reduce Salmonella Illnesses Attributable to Poultry," accessed October 1, 2025. Note: Healthy People 2020 and 2030 targets were 11.4 and 11.5 per 100,000 people, respectively, both represented by the red dashed line.

21 Lisa L. Gill, "Is Our Ground Meat Safe to Eat?" *Consumer Reports*, June 30, 2022.

22 Gill, "Is Our Ground Meat Safe to Eat?"

23 "Salmonella Framework for Raw Poultry Products: A Proposed Rule by the Food Safety and Inspection Service," USDA FSIS, *Federal Register*, 9 CFR Part 381, August 8, 2024.

fact, progress toward the 2010 target of 6.8 infections per 100,000 people was so poor that the target was increased 125 percent, to 15.4 per 100,000. Even that target has thus far remained out of reach.

In addressing salmonella linked to poultry, current regulatory approaches focus primarily on reducing overall contamination rates rather than addressing how production conditions shape pathogen evolution and persistence, and indeed, how the remaining salmonella contamination is increasingly concentrated in strains most likely to make people sick. FSIS itself admitted that its "current approach to *Salmonella* has not led to a demonstrable reduction in *Salmonella* infections"[24] and "FSIS testing data show that Salmonella contamination on poultry has been going down, but this has not translated into a reduction in human illnesses. Rates of human illness have remained stagnant over the last two decades, and we have not moved any closer to the national goal of a 25 percent reduction in Salmonella illnesses."[25]

Why is poultry's contamination rate an ineffective indicator of salmonella infection rates in people? The answer has to do with serotypes—particular strains of salmonella. When the reduction in contamination is concentrated in strains that do not tend to cause illness in people, as opposed to the strains most likely to make people sick, then rates of illness do not decline as contamination decreases.

The Critical Importance of Serotype

Not all salmonella is created equal. Of more than 2,500 salmonella serotypes, fewer than 100 are typically linked to human illness.[26] Some serotypes cause illness in birds but not in humans because they are adapted to avian physiology; others rarely cause illness in birds but can sicken people. The CDC maintains a list of salmonella "serotypes of concern"—those that are most likely to cause human illness—in different food commodities.[27] FSIS and the CDC consistently highlight *Salmonella Infantis*, *Enteritidis*, and *Typhimurium* as major contributors to human illness emerging from the poultry industry.[28] These serotypes, along with *Salmonella Kentucky* (a lower-virulence serotype), are those most commonly found in the poultry industry (see Figure 2).

24 "Proposed Regulatory Framework to Reduce Salmonella Illnesses Attributable to Poultry," USDA FSIS, accessed October 1, 2025.

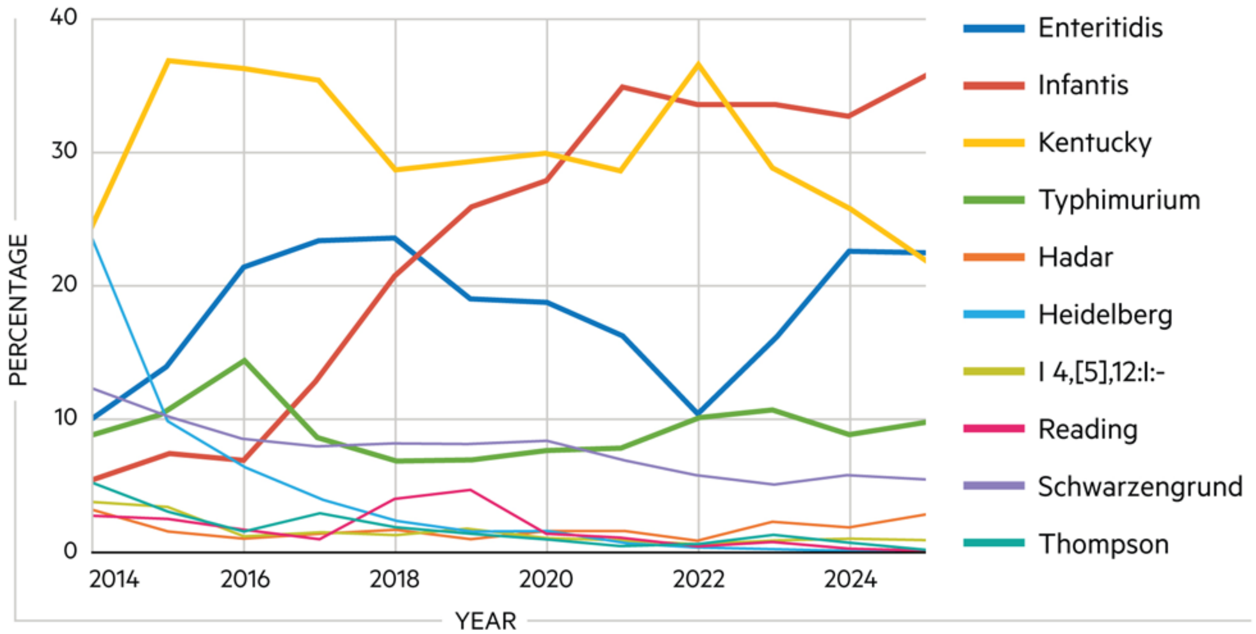
25 "Salmonella By the Numbers," USDA FSIS.

26 "Serotypes Profile of Salmonella Isolates from Meat and Poultry Products: January 1998 through December 2014," USDA FSIS, accessed June 10, 2026.

27 T.S. Katz et al., "Identifying a List of Salmonella Serotypes of Concern to Target for Reducing Risk of Salmonellosis." *Frontiers in Microbiology* 15 (2024): 1307563

28 "Salmonella Framework for Raw Poultry Products," USDA FSIS.

Figure 2. Top 10 Most Common Serotypes (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Salmonella Infantis, *Enteritidis*, and *Typhimurium* are considered high virulence and higher risk based on epidemiological patterns and clinical severity. Lower-virulence serotypes, such as *Salmonella Kentucky*, are less frequently associated with human illness. High-virulence serotypes cause illness ranging from relatively mild symptoms (e.g., diarrhea, fever, vomiting) to severe and even life-threatening conditions, including sepsis, bloodstream infection, and organ failure.

The top three serotypes most likely to cause human illness now account for just over two-thirds of salmonella in the poultry industry, increasing disease risk to consumers.

As the top high-virulence serotypes, *Infantis, Enteritidis,* and *Typhimurium* now account for 67.9 percent of salmonella detected in the poultry industry (more than double the 25.3 percent recorded in 2014). When antibiotic resistance is added, moderate and severe cases may become more difficult, or even impossible, to treat.

The Crisis of Antibiotic Resistance

The WHO and CDC both warn that antibiotic resistance is one of the most urgent global health crises of our time, raising the risk that even commonplace infections could become untreatable, leading to increased rates of hospitalization and death.[29] According to the CDC, there are already more than 2.8 million antibiotic-resistant infections in the

29 "Antibiotic Resistance Threats in the United States 2019," CDC; "Antimicrobial Resistance: Key Facts," WHO, 2021.

U.S. annually.[30] One in 80 people with these infections die as a result.[31] Globally, the number of deaths associated with antibiotic resistance is 4.95 million annually, with 1.27 million deaths directly attributed to resistant bacterial infections.[32] By 2050, more than 10 million people could die worldwide each year from resistant infections.[33] Antibiotic-resistant salmonella accounts for 212,500 of these infections each year in the U.S., thousands more than the population of Rochester, New York, Birmingham, Alabama, or Grand Rapids, Michigan. And salmonella's antibiotic resistance continues to increase.[34]

Antibiotic resistance is defined as resistance to one or two antibiotic classes, as categorized by the WHO, that are highly important for human medicine. When salmonella becomes resistant to even more antibiotic classes, treatment options become increasingly limited. Multidrug resistance, defined as resistance to three or more antibiotic classes, is particularly concerning because it can render standard treatments ineffective and increase the likelihood of hospitalization, complications, and death.

The WHO reports that we may be entering a post-antibiotic era in which even common infections become difficult or impossible to treat.[35] This possibility stems from the rapid growth in antibiotic resistance and the fact that there are inadequate resources being dedicated to research and the development of new antibiotics.[36] The antibiotic-development pipeline is significantly outpaced by the evolution of resistance. To understand what a post-antibiotic era would look like, we can look back to the pre-antibiotic era where a minor injury (e.g., a cut from a kitchen knife or a scraped knee) or a minor illness (e.g., strep throat or a urinary tract infection) could lead to an invasive systemic infection and death.[37] Even routine surgeries, like joint replacements, cesarean sections, and appendectomies, could become unsafe to perform. In 2023, the WHO documented that 1 in 6 common bacterial infections were resistant to antibiotic treatments, meaning this is not a distant or hypothetical threat—it's actively affecting millions of people worldwide.[38]

In 2025, nearly three-quarters of poultry samples were antibiotic resistant, and nearly one-third were multidrug resistant.

30 "Antibiotic Resistance Threats in the United States 2019," CDC.

31 Antibiotic Resistance Threats in the United States 2019," CDC.

32 Christopher Murray et al., "Global Burden of Bacterial Antimicrobial Resistance in 2019: A Systematic Analysis," *The Lancet* 399, no. 10325 (2022): 629-655.

33 Mohsen Naghavi et al., Global Burden of Bacterial Antimicrobial Resistance 1990–2021: A Systematic Analysis with Forecasts to 2050," *The Lancet* 404, no. 10459 (2024): 1199-1226.

34 "Whole-genome Sequencing and the Race Against Antibiotic Resistance," CDC, April 7, 2025; F. Medalla et al. "Increased Incidence of Antimicrobial-Resistant Nontyphoidal Salmonella Infections, United States, 2004–2016," *Emerging Infectious Diseases* 27, no. 6 (2021): 1662-1672.

35 "Global Antibiotic Resistance Surveillance Report 2025," WHO, October 13, 2025.

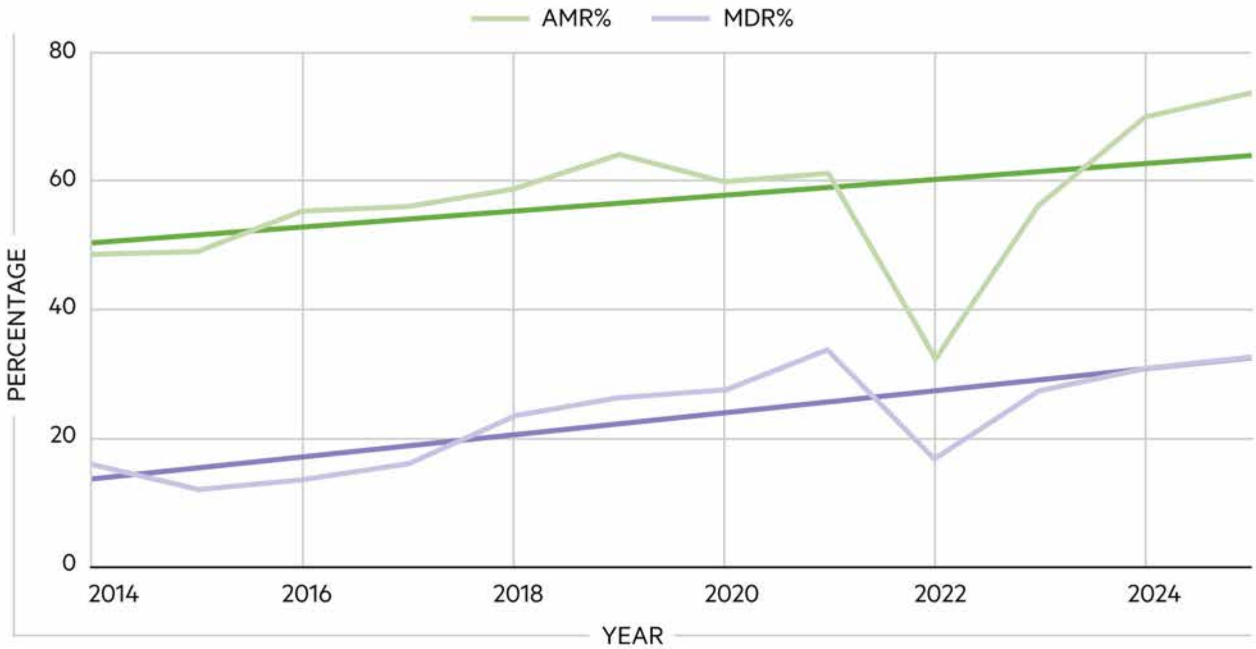
36 "Antimicrobial Resistance," WHO, November 21, 2023.

37 Steve W.. Kerrigan, "What a 'Post-antibiotic Era' Could Mean for Modern Medicine," *The Conversation*, April 23, 2026.

38 "WHO Warns of Widespread Resistance to Common Antibiotics Worldwide," WHO, October 13, 2025.

A significant portion of the antibiotic resistance burden is linked to the industrial animal sector. In the poultry industry, 73.3 percent of poultry samples tested were resistant to one or more antibiotics (up from 48.1 percent in 2014; see Figure 3). Multidrug resistance has also increased significantly: 32.4 percent of samples were multidrug resistant in 2025, compared to 15.9 percent in 2014, a 16.5 percentage-point increase (see Figure 3).

Figure 3. Percentage of Antibiotic Resistance and Multidrug Resistance in Salmonella-Positive Poultry Samples (2014–2025)



Source: "[Raw Poultry Sampling](#)," USDA FSIS, accessed April 3, 2026.

These trends highlight how antibiotic resistance in poultry production is becoming increasingly entrenched in the industry. Industrial poultry production is not a bystander to the antibiotic resistance crisis. It is a primary driver of it and passes the consequences and costs to the public.

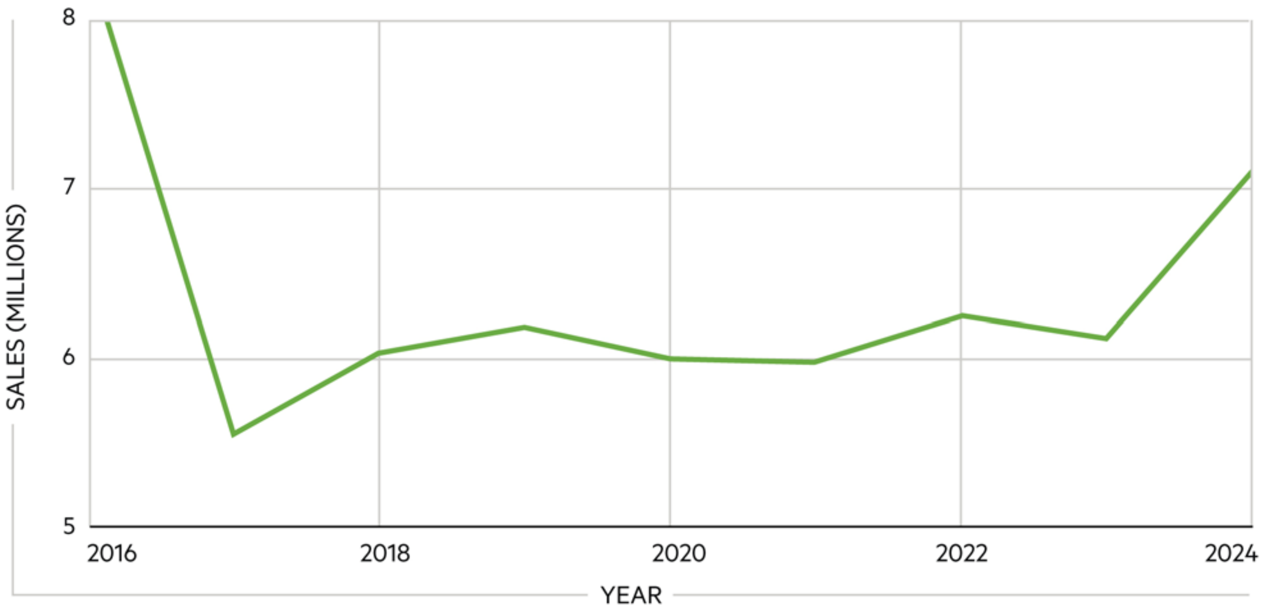
The Industrial Animal Sector's Role in the Antibiotic Resistance Crisis

Antibiotic use is a cornerstone of the industrial animal sector. In the U.S., two-thirds (66 percent) of antibiotics important for human medicine are sold for use in farmed animals, not for people.[39] Industrial farms are breeding grounds for many pathogens, necessitating the widespread, regular application of antibiotics in low, subtherapeutic doses to keep animals alive in the high-confinement, overcrowded, and unhygienic conditions they are raised in.[40] This subtherapeutic use of antibiotics has been identified as a serious risk factor for antibiotic resistance and its spread to humans.[41]

For decades, the WHO has cautioned that antibiotic use in farmed animals contributes to bacterial resistance that can spread to people and cause illness, undermining the effectiveness of life-saving drugs.[42] Still, the industry allows antibiotic resistance to proliferate throughout the poultry supply chain.[43]

The overuse and misuse of antibiotics in the industry and the emergence of antibiotic-resistant salmonella are not unrelated. The low-dose antibiotics administered in breeding farms, hatcheries, and grow-out operations

Figure 4. Sales of Medically Important Antibiotics for Use in Farmed Animals (2016–2024)



Source: "Antimicrobial Sales and Distribution Data 2015-2024," FDA, updated November 21, 2025.

39 David Wallinga et al., "A Review of the Effectiveness of Current US Policies on Antimicrobial Use in Meat and Poultry Production." *Current Environmental Health Reports 27,* no. 9 (2022): 339–354.

40 Wallinga et al., "A Review of the Effectiveness of Current US Policies on Antimicrobial Use."

41 T.P. Robinson et al., "Antibiotic Resistance is the Quintessential One Health Issue," *Transactions of the Royal Society of Tropical Medicine and Hygiene* 110, no. 7 (2016): 377-80.

42 "Stop Using Antibiotics in Healthy Animals to Prevent the Spread of Antibiotic Resistance," WHO, November 7, 2017; C. Xu et al., "A Review of Current Bacterial Resistance to Antibiotics in Food Animals," *Frontiers in Microbiology* 13 (2022): 822689.

43 R. Abreu et al., "Antimicrobial Drug Resistance in Poultry Production: Current Status and Innovative Strategies for Bacterial Control," *Microorganisms* 11, no. 4 (2023): 953.

have been directly linked to the evolution of antibiotic-resistant pathogens, like salmonella, and research has found that birds raised on farms using antibiotics are more likely to carry antibiotic-resistant salmonella than those raised on farms that do not use antibiotics.[44]

Despite longstanding calls for stronger action to reduce the use of medically important antibiotics in agriculture, neither voluntary industry efforts nor the current regulatory framework have meaningfully reduced antibiotic use. The FDA regulates how these antibiotics may be used, but does not set binding limits on overall use or require industry-wide reductions.

Between 2016 and 2017, sales of medically important antibiotics for use in farmed animals declined sharply, but then leveled off, with no further meaningful reductions. Then, in 2024, sales surged, showing a 16 percent increase from 2023 (see Figure 4).[45]

At a time when the industrial animal sector can and should be organizing itself to reduce antibiotic use, it instead maintains its status quo practices that continue to drive the global antibiotic resistance crisis and endanger public health.

FSIS Tracking of Salmonella in the Poultry Industry

USDA's FSIS monitors and reports data on salmonella contamination in poultry slaughter and processing plants using "performance standards." Plants are tested for the presence of salmonella, and results are used to assign category ratings based on the percentage of positive samples. Category 3 represents the lowest performance level and indicates failure to meet FSIS standards. An earlier report from Farm Forward analyzed these data to identify the plants where contamination was consistently the highest across multiple years.[46] Although this analysis provided a comprehensive view of the frequency with which plants met or failed the FSIS performance standard, the standard system itself has critical limitations.

First, FSIS category ratings do not reflect the degree to which a plant fails the standard. A plant with 15.5 percent contamination and a plant with 100 percent contamination would both receive a Category 3 designation, despite posing substantially different levels of risk.

Second, FSIS ratings are based solely on the presence or absence of salmonella and do not

44 Abreu et al., "Antimicrobial Drug Resistance in Poultry Production;" Xin Yin et al., "Antimicrobial Resistance in Non-Typhoidal Salmonella from Retail Poultry Meat by Antibiotic Usage-related Production Claims – United States, 2008–2017," *International Journal of Food Microbiology* 342 (2021): 109044.

45 "2024 Summary Report On Antimicrobials Sold or Distributed for Use in Food-Producing Animals," FDA.

46 "How the USDA & the US Poultry Industry Fail to Protect Americans from Foodborne Disease," Farm Forward, October 2025.

take into account which serotype is present, or whether that strain is resistant to antibiotics. These two factors matter much more than whether a sample is contaminated. Plants can appear equivalent in regulatory assessments even when the underlying public health risks they present differ substantially.

FSIS *does*, in fact, track samples' levels of antibiotic resistance. When a sample tests positive for salmonella, FSIS identifies the serotype and tests the isolate against 17 different antibiotics classified by the WHO as highly important for the treatment of human disease.[47] These 17 antibiotics span 12 different drug classes, including Highly Important Antimicrobials, Critically Important Antimicrobials, and Highest Priority Critically Important Antimicrobials.[48] See the appendix for WHO classifications of the full list of antibiotics included in FSIS testing.

Any persistent antibiotic resistance creates risk for consumers, but multidrug resistance poses a more serious threat. Most dangerous are high-virulence serotypes most likely to cause serious human illness, that develop resistance to multiple drug classes. Mitigating actual consumer risk depends on accurately tracking and responding to data on serotype combined with antibiotic resistance.

Yet, **despite collecting this information, FSIS does not incorporate serotype or antibiotic resistance data into plant ratings.** As a result, oversight is based on incomplete and inadequate information that does not distinguish between low-risk and high-risk contamination, limiting the ability of government, stakeholders, and the industry to target the most consequential strains of salmonella in poultry plants.

The Failures of the Federal Government in Salmonella Control

Even if FSIS incorporated critical serotype and antibiotic resistance data into its plant ratings, it also lacks sufficient enforcement authority to address contamination. While FSIS sets performance standards and conducts testing, it does not have the authority to recall contaminated products, order plant closures, or stop the sale of contaminated poultry, *even when facilities repeatedly fail the standards*. Because companies cannot be legally compelled to control salmonella in their plants or on the farm—and because many do not do so voluntarily—chronic contamination is allowed to persist across the poultry industry.

47 "WHO List of Medically Important Antimicrobials," World Health Organization (WHO), 2024.

48 **Highly Important Antimicrobials (HIA)** are classes of antibiotics that are important for treating human bacterial infections but do not meet both criteria required to be classified as critically important. Typically they meet one of the two criteria used for critical importance; **Critically Important Antimicrobials (CIA)** are those antibiotics that meet *both* of the WHO's criteria for critical importance: 1) they are the sole or one of a limited number of drugs used for treating serious bacterial infections in humans, *and* 2) they are used to treat infections caused by bacteria that may be transmitted from nonhuman sources or that may acquire resistance genes from nonhuman sources; **Highest Priority Critically Important Antimicrobials (HPCIA)** are a subset of critically important antibiotics that the WHO considers the highest priority for stewardship because they satisfy the same criteria as the CIA category and are further prioritized based on factors such as extensive use in human medicine, their importance for treating serious infections (often when few alternatives exist), and evidence that resistance can arise from or be transmitted through nonhuman sources.

This creates a regulatory environment in which the persistence of contamination is effectively embedded in the normal functioning of the production system.

In an effort to meet the FSIS salmonella reduction targets and address the longstanding shortcomings in regulating salmonella, in August 2024, USDA proposed a significant step forward: a rule that would have allowed USDA to classify salmonella as an adulterant, which would give the agency the authority to recall, condemn, or stop the sale of raw poultry products contaminated with certain levels of salmonella.[49]

However, in April 2025, USDA withdrew that proposed rule, citing comments from stakeholders (many of them from the industry) about regulatory overreach and economic impacts.[50] This withdrawal further cements USDA's failure to address longstanding gaps in effective salmonella control, leaving the agency powerless to enforce standards and drastically reducing the chances of achieving the 2030 target of reducing salmonella contamination from all sources by 25 percent.[51]

On balance, the full picture is cause for serious alarm: an industrial animal sector that contributes significantly to the antibiotic resistance crisis in its widespread misuse of these essential medicines; a poultry industry that allows high-virulence and antibiotic-resistant salmonella serotypes to proliferate; and a federal government with no authority to manage this crisis.

49 "Salmonella Framework for Raw Poultry Products," USDA FSIS.

50 "Notice of Withdrawal: Salmonella Framework for Raw Poultry Products," USDA FSIS, *Federal Register,* Vol. 90, No. 79, Apr 25, 2025; "Press Release: Secretary Rollins Announces New Plan to Bolster Meat and Poultry Safety," USDA FSIS, July 15, 2025.

51 "Salmonella Framework for Raw Poultry Products," USDA FSIS.

THE POULTRY INDUSTRY'S DOUBLE THREAT: *DANGEROUS STRAINS AND ANTIBIOTIC RESISTANCE*

Salmonella in the poultry industry poses two distinct risks: illness—including severe illness—and illness that antibiotics can't treat. When these two factors combine and high-virulence serotypes become resistant to antibiotics—the threat is magnified.

FSIS surveillance evaluates antibiotic resistance in salmonella by testing 17 antibiotics representing 12 major drug classes. This framework measures not just resistance to individual drugs, but also whether entire categories of treatment remain effective. These drugs are used in both outpatient and hospital treatment, including first-line therapies and last-resort options for multidrug-resistant infections. In practical terms, these are layered lines of defense, not interchangeable tools.

When resistance emerges across one or more of these classes, it directly impacts bedside care of ailing patients. Physicians lose entire categories of treatment options and are forced to rely on broader-spectrum, less effective, or more dangerous alternatives. They may need to revise initial treatment choices once resistance profiles are confirmed, delaying the most effective therapy. In more severe cases, especially among young children, older adults, and immunocompromised patients, this delay or treatment incompatibility can translate into prolonged illnesses, higher rates of hospitalization, increased risk of complications, and potential fatalities.

Rising Trends in High-Virulence Serotypes and Antibiotic Resistance

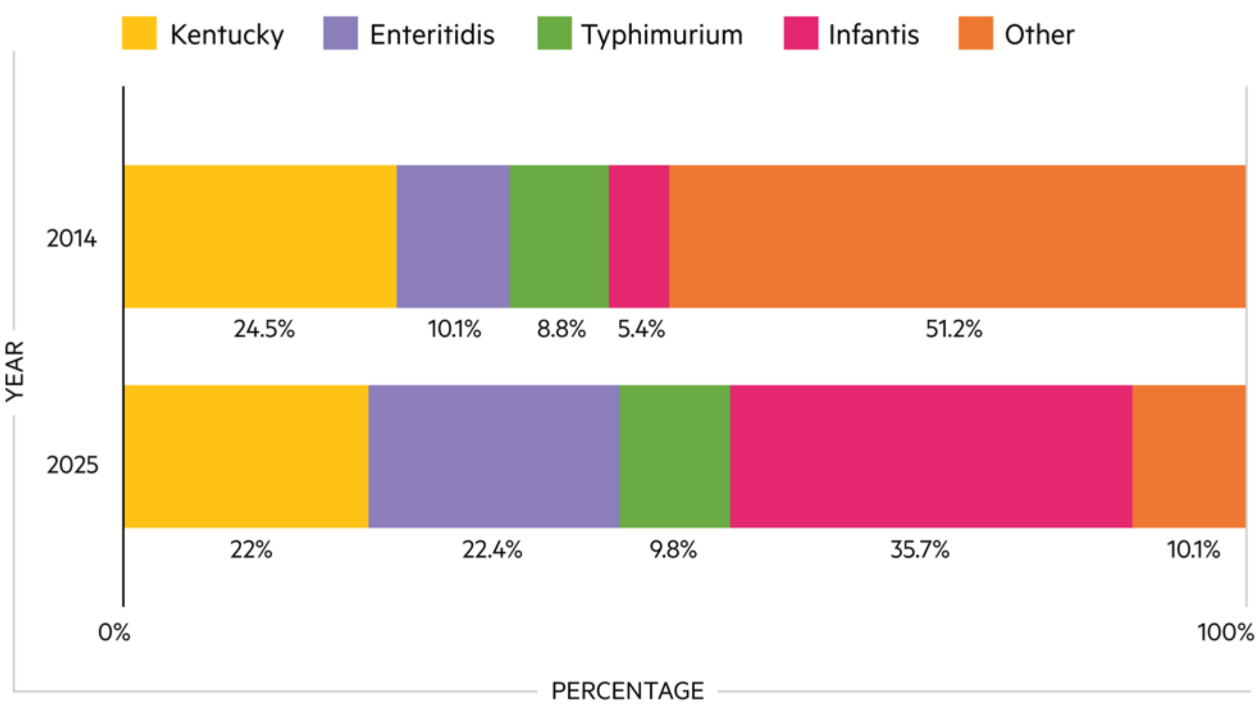
The interaction between serotype virulence and antibiotic resistance means that risk is not determined simply by the presence of salmonella, but by which strains circulate and how resistant they are to treatment. Although overall contamination in the poultry industry has declined over time, FSIS surveillance data show a marked shift in the *composition* of circulating serotypes toward those most associated with human illness. Antibiotic resistance and multidrug resistance have increased significantly between 2014 and 2025. This shift toward highly virulent serotypes with increasingly prevalent antibiotic resistance means that for a person sickened by an antibiotic-resistant strain of one of these serotypes, what might have been a mild illness could turn serious or life-threatening.

Evolving Serotypes in the Poultry Industry

Serotype composition evolves across time, favoring those that can persist and spread within bird populations. Today, the most commonly found serotypes in poultry are high-virulence *Salmonella Infantis,* high-virulence *Enteritidis*, and high-virulence *Typhimurium*, as well as low-virulence *Salmonella Kentucky*. Since 2014, while *Typhimurium* prevalence has increased slightly and *Kentucky* has decreased slightly, *Enteritidis* prevalence has more than doubled, increasing by 122 percent, and *Infantis* prevalence has increased by 521 percent.

Point-in-time percentages for 2014 and 2025 show this shift in serotype composition even more dramatically (see Figure 5):

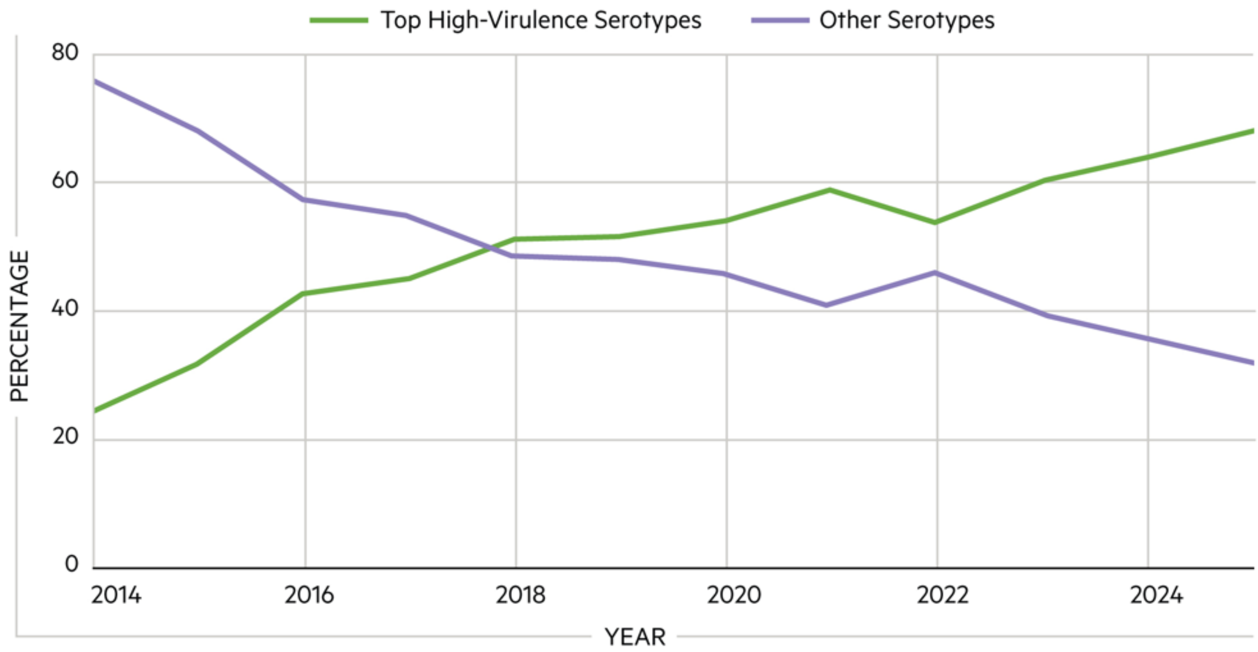
Figure 5. Serotype Composition (2014 and 2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Collectively, the proportion of the three highest-concern serotypes (*Infantis*, *Enteritidis*, and *Typhimurium*) versus other serotypes in the industry has steadily increased over time, from 24.3 percent in 2014 to 67.9 percent in 2025—or a 43.6 percentage-point increase (see Figure 6).

Figure 6. Top 3 High-Virulence vs. Other Serotypes (2014–2025)



Source: "[Raw Poultry Sampling](#)," USDA FSIS, accessed April 3, 2026.

Put simply, between 2014 and 2025, *Infantis*, *Enteritidis*, and *Typhimurium* increased from accounting for roughly one-quarter to more than two-thirds of salmonella in the industry. This indicates a biological shift in the poultry ecosystem toward the serotypes most strongly associated with human disease. Whereas *Kentucky* (a low-virulence serotype) had long dominated the serotype distribution, high-virulence *Infantis* and *Enteritidis* have each displaced it, increasing the public health burden.

Antibiotic Resistance in Top High-Virulence Serotypes

Compounding the problem of the growing dominance of the top three high-virulence serotypes is the growing prevalence of antibiotic resistance and multidrug resistance, limiting the availability of drugs effective against highly invasive salmonella infections. Drugs previously used to treat salmonella—like chloramphenicol, ampicillin, trimethoprim-sulfamethoxazole, and tetracyclines—have been largely phased out because high rates of resistance to those drugs have rendered them often ineffective.[52] The result: salmonella treatment relies on a shrinking set of effective drugs.

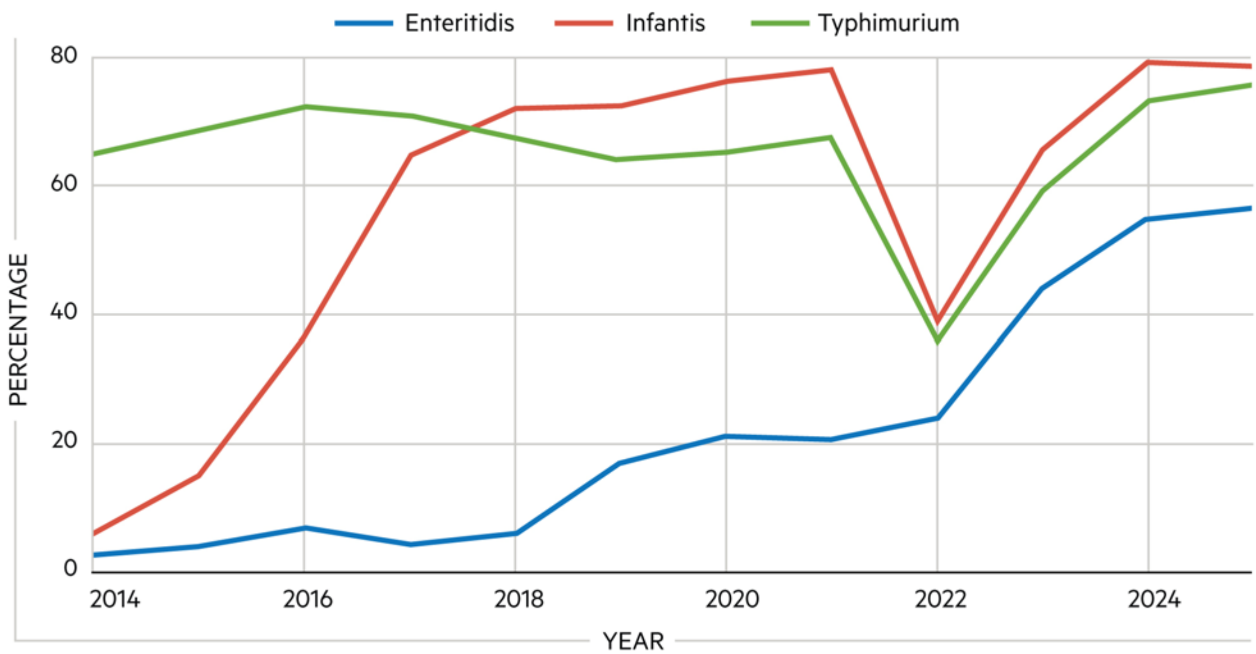
Antibiotics previously relied upon to treat invasive salmonella infection have increasingly been rendered ineffective as antibiotic resistance increases, limiting treatment options when illnesses become serious.

52 J.A. Crump et al., "Epidemiology, Clinical Presentation, Laboratory Diagnosis, Antimicrobial Resistance, and Antimicrobial Management of Invasive Salmonella Infections," *Clinical Microbiology Reviews* 28, no. 4 (2015): 901-37.

The Predominance of Antibiotic Resistance

Between 2014 and 2025, antibiotic resistance increased sharply, with a 13.1 percentage-point increase in antibiotic resistance for *Typhimurium*, a 67.4 percentage-point increase for *Enteritidis*, and a 90 percentage-point increase for *Infantis*. In 2025, more than two-thirds (70.6 percent) of *Enteritidis* isolates, 94.3 percent of *Typhimurium* isolates, and 97.8 percent of *Infantis* isolates in poultry samples tested by FSIS were resistant to one or more antibiotics (see Figure 7 for 2014–2025 trends).

Figure 7. Antibiotic Resistance Trends in Top 3 High-Virulence Serotypes (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Point-in-time comparisons highlight this increase with particular starkness:

Samples resistant to one or more antibiotics

In 2014:

- **3.2%** of *Enteritidis* samples
- **7.8%** of *Infantis* samples
- **81.2%** of *Typhimurium* samples

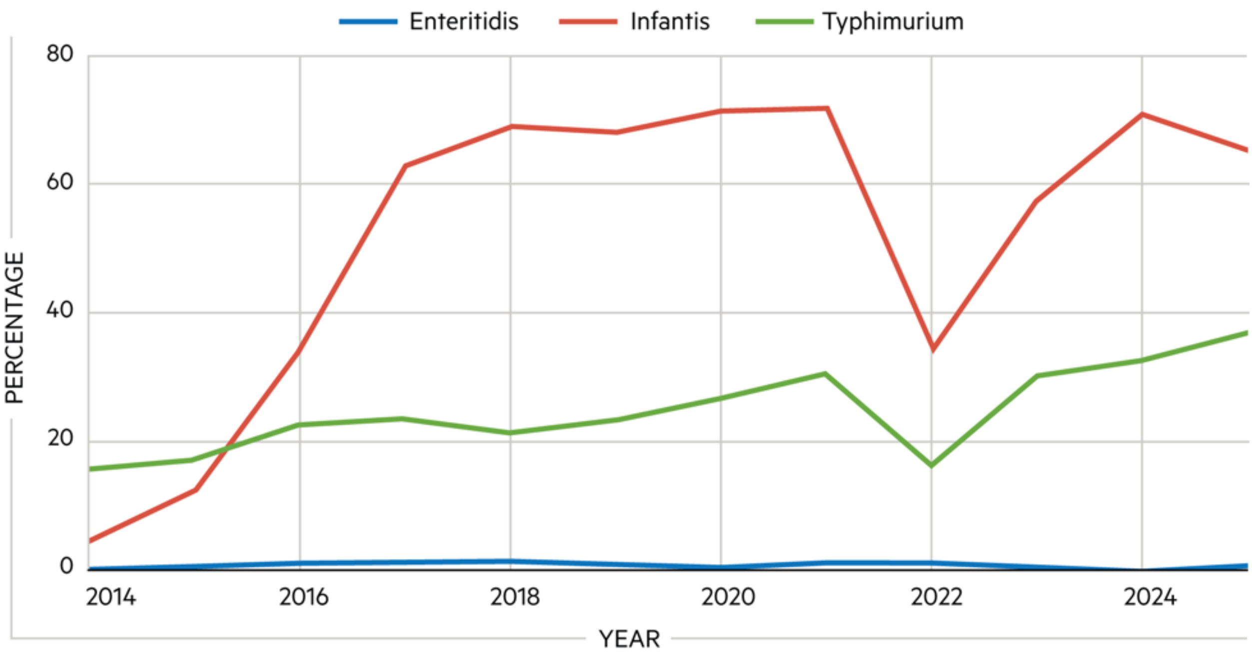
In 2025:

- **70.6%** of *Enteritidis* samples
- **97.8%** of *Infantis* samples
- **94.3%** of *Typhimurium* samples

A Marked Growth in Multidrug Resistance

Between 2014 and 2025, *Enteritidis*'s multidrug resistance (resistance to three or more classes of highly important antibiotics) held steady, increasing by only 0.7 percentage points; *Typhimurium*'s multidrug resistance increased by 26.5 percentage points; and *Infantis*'s multidrug resistanceincreased by 75.8 percentage points. In 2025, 0.7 percent of positive *Enteritidis* samples, 46.5 percent of *Typhimurium* samples, and 81.7 percent of *Infantis* samples were multidrug resistant (see Figure 8).

Figure 8. Multidrug Resistance Trends in Top 3 High-Virulence Serotypes (2014–2025)



Source: "[Raw Poultry Sampling](),” USDA FSIS, accessed April 3, 2026.

Percentage of positive samples that were multi-drug resistant

In 2014:

0.0% of *Enteritidis* samples

5.9% of *Infantis* samples

20% of *Typhimurium* samples

In 2025:

0.7% of *Enteritidis* samples

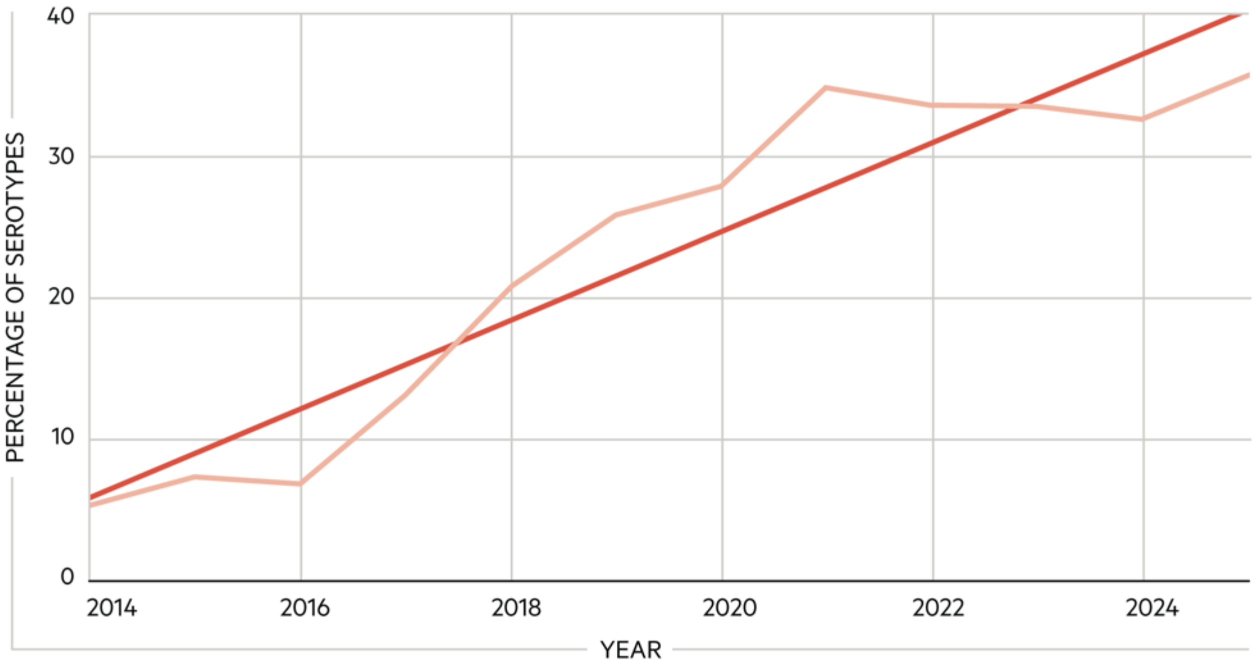
46.5% of *Infantis* samples

81.7% of *Typhimurium* samples

Salmonella Infantis: The Dark Horse

The most significant serotype shift in the poultry industry over the last decade is the meteoric rise of *Salmonella Infantis*. Since it appeared in 2014, when it accounted for 5.4 percent of positive samples, *Infantis* has become the most prevalent serotype in FSIS poultry sampling, now comprising more than a third (35.7 percent) of all positive salmonella samples identified (see Figure 9).

Figure 9. Prevalence of *Infantis* (2014–2025)

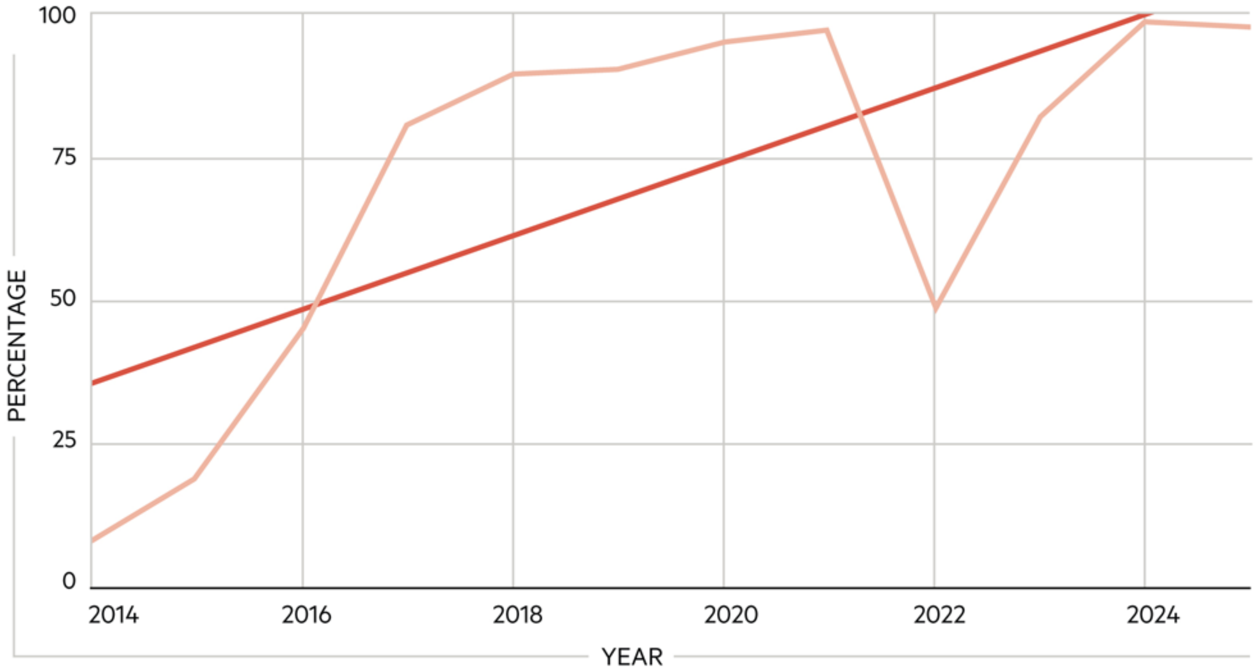


Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

The combination of three unique traits makes *Infantis* a serious risk to public health: 1) it spreads readily in poultry production systems, 2) it frequently carries multidrug resistance genes, and 3) it causes (sometimes severe) human illness. Many serotypes have one or two of those characteristics; *Infantis* increasingly has all three.

Infantis has increased most dramatically not only in prevalence, but also in its now-nearly-universal antibiotic resistance. In 2014, 7.8 percent of *Infantis* isolates showed antibiotic resistance. By 2025, that figure leaped to 97.8 percent (see Figure 10).

Figure 10. Antibiotic Resistance Trend in *Infantis* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

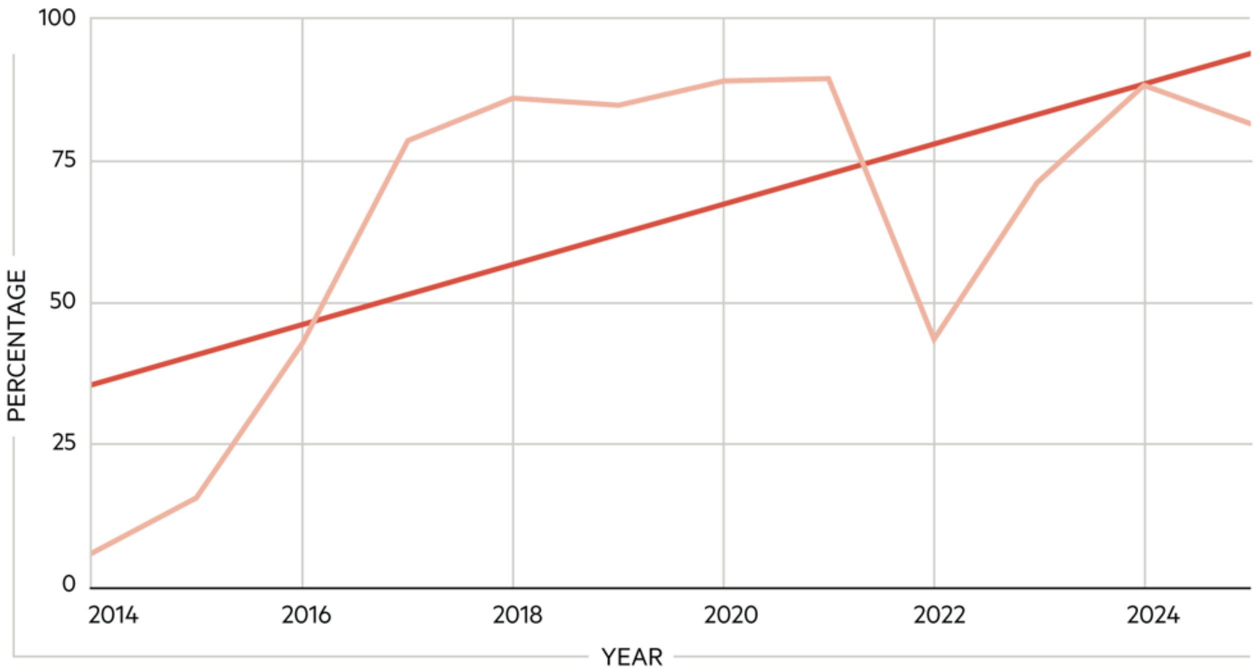
One of the primary antibiotics used to treat invasive infections caused by *Infantis* and other non-typhoidal salmonella is ciprofloxacin (part of the fluoroquinolone class). *Infantis* shows a dramatic decrease in "susceptibility to ciprofloxacin," a metric used by the National Antimicrobial Resistance Monitoring System (NARMS). Ciprofloxacin is also used to treat a wide range of bacterial infections, including pneumonia, urinary tract infections, bronchitis, sinus infections, and infections of the bones, joints, skin, and abdomen. Because they are considered critical for serious human infections, fluoroquinolones have been banned for use in poultry since 2005. Even small decreases in susceptibility represent a major epidemiological concern. In 2014, decreased susceptibility to ciprofloxacin was found in 2.3 percent of *Infantis* samples, according to NARMS tracking. Between 2014 and 2022, that figure jumped from 2.3 percent of samples to nearly all (98.0 percent).[53]

Decreased susceptibility to ciprofloxacin—a Highest Priority Critically Important Antimicrobial for treating invasive salmonella and other common infections—is now nearly universal (98 percent) in *Infantis* poultry samples.

Multidrug resistance has also seen a similarly dramatic increase. In 2014, 5.9 percent of isolates were multidrug-resistant, growing to 81.7 percent by 2025 (see Figure 11).

53 "NARMS Now: Integrated Data," FDA, updated May 18, 2026.

Figure 11. Multidrug Resistance Trend in *Infantis* (2014–2025)



Source: "[Raw Poultry Sampling](#)," USDA FSIS, accessed April 3, 2026.

These trends show that *Infantis* is not just becoming marginally more resistant; it is becoming dramatically more resistant to many antibiotics at once.

Infantis cases in humans have risen significantly in recent years, alarming public health officials with their rapidly increasing prevalence;[54] between 2015 and 2021, diagnosed cases multiplied fivefold, with poultry a common source of infection.[55]

Like other serotypes, *Infantis* causes temporary and self-limiting gastrointestinal illness in healthy individuals, but can lead to severe disease in vulnerable populations, such as young children, older adults, and those with weakened immune systems.[56] When a serious infection does occur, antibiotics are often needed to treat the illness. *Infantis's* antibiotic resistance and multidrug resistance profile makes this increasingly difficult.

A multistate outbreak in 2018 made clear the life-and-death stakes of multidrug-resistant *Infantis* when 129 people were sickened, 25 were hospitalized, and Arthur Sutton died. Documented cases rely on diagnoses, and the CDC—which recorded these 165 cases—estimates that only about 1 in 30 salmonella cases are diagnosed; the true number caused by this outbreak is likely much higher.[57]

54 Diana M. Alvarez et al., "A Review of the Global Emergence of Multidrug-resistant Salmonella Enterica Subsp. Enterica Serovar Infantis," *International Journal of Food Microbiology* 403 (2023): 110297; Jennifer Mattock et al., "A One Health Perspective on Salmonella Enterica Serovar Infantis, An Emerging Human Multidrug-Resistant Pathogen," *Emerging Infectious Diseases* 30, no. 4 (2024): 701-710.

55 Yueng et al., "America's Food Safety System Failed."

56 "Salmonella (Salmonellosis)," FDA, March 29, 2019.

57 These are the cases documented by the CDC. In reality, the number is likely much higher. The CDC estimates that only 1 in 30 cases of salmonella is diagnosed. "Estimates: Burden of Foodborne Illness," CDC.

Even for these documented cases, where salmonella was correctly diagnosed, antibiotics typically used to treat salmonella weren't working because the *Infantis* strain had developed a high level of resistance to multiple commonly used antibiotics.[58] Initially, public health officials were unable to identify a single source of contamination. Although the CDC managed to trace the outbreak to contaminated chicken products, the agency closed its investigation in February 2019 without addressing the root cause of ongoing infections, noting instead that "illnesses could continue because this *Salmonella* strain appears to be widespread in the chicken industry."[59] The outbreak continued to spread.[60] As a result, in addition to this particular strain persisting, it has also had time to evolve, increase virulence, and develop new resistances.

Another persistent strain (REPJFX01), linked to poultry since 2012, is an ongoing focus for the CDC. The agency has thus far analyzed 12 percent of reported cases and documented that, of these, 30 percent of people were hospitalized, 6 percent were admitted to intensive care, and 1 percent died. For those who received antibiotics, 79 percent of infections resisted an antibiotic treatment the patients received.[61] In epidemiological research, the REPJFX01 *Infantis* strain has been found resistant to some of the most important drugs, including trimethoprim-sulfamethoxazole (a Highly Important Antimicrobial), ampicillin (Critically Important Antimicrobial), ceftriaxone (Highest Priority Critically Important Antimicrobial), and ciprofloxacin (Highest Priority Critically Important Antimicrobial).[62]

Because *Infantis* is increasing in prevalence, these outbreaks sound an alarm that this serotype poses an increasingly serious threat to public health.

Salmonella Enteritidis: The Silent Infiltrator

Historically, *Salmonella Enteritidis* had been the most prevalent high-virulence serotype in the poultry industry before being overtaken by *Infantis*. Today, it accounts for roughly 22.4 percent of salmonella identified in the industry, up from 10.1 percent in 2014 (see Figure 12).

58 Yueng et al., "America's Food Safety System Failed."

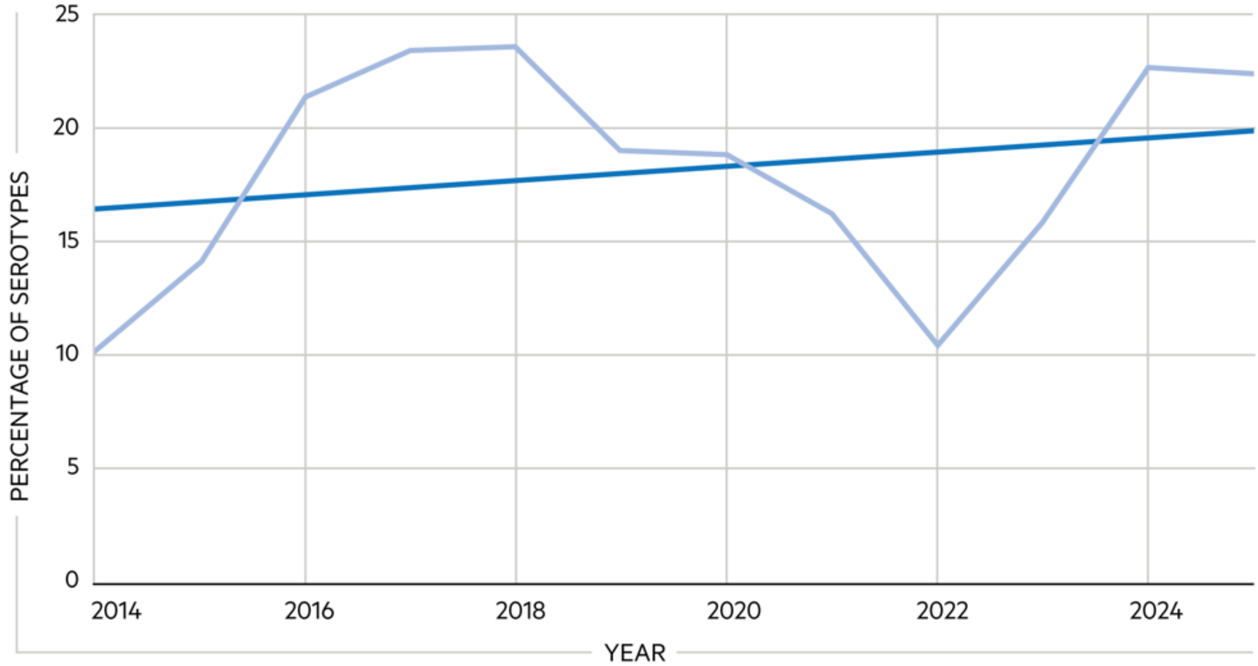
59 "Investigation Notice," CDC, February 21, 2019.

60 Yeung et al., "America's Food Safety System Failed."

61 "Data Summary: Persistent Strain of Salmonella Infantis (REPJFX01)," CDC, July 9, 2025.

62 Laura Ford et al., "Trends in a Persistent Strain of Multidrug-Resistant Salmonella Infantis (REPJFX01) in Humans and Chickens — United States, 2010–2023," *Journal of Food Protection* 89, no. 5 (2026): 100763.

Figure 12. Prevalence of *Enteritidis* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Enteritidis's persistence is driven by highly efficient transmission mechanisms that often allow it to move through poultry production systems unnoticed, since it does not cause illness in birds who appear healthy across their lifetimes but harbor bacteria pathogenic to people. In turn, these bacteria reach the human food supply and cause human illness. *Enteritidis* poses an added risk not just to young children, elders, and immunocompromised individuals, but also to pregnant women through the potential for fetal infections.[63]

Of particular concern is its ability to move undetected through healthy flocks, which can translate into disproportionately frequent human infections linked to poultry products worldwide. *Enteritidis* also has a unique capacity to colonize the reproductive tracts of laying hens in breeding facilities and contaminate the interior of eggs while producing little or no obvious disease in infected laying hens.[64] *Enteritidis* infections emerge undetected at the very beginning of the poultry supply chain, in breeder flocks and hatcheries, allowing the pathogen to be repeatedly reintroduced into broiler populations.

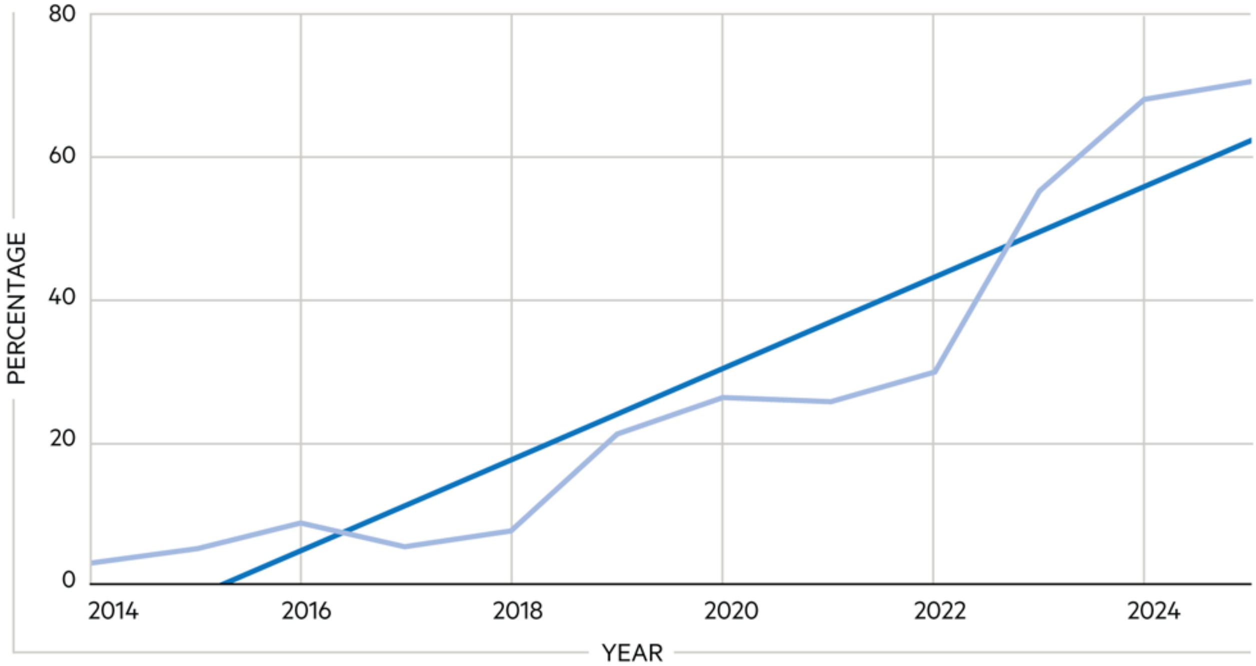
The public health significance of *Enteritidis* in broiler systems is largely driven by its high transmission efficiency and its consistent success in establishing and maintaining a pathway from poultry production to human infection across many regions and production systems. As a result, it remains one of the most closely monitored serotypes in poultry supply chains.

63 B. Liu et al., "The Vertical Transmission of Salmonella Enteritidis in a One-Health Context," *One Health* 16 (2022): 100469.

64 Inne Gantois et al., "Mechanisms of Egg Contamination by Salmonella Enteritidis," *FEMS Microbiology Reviews* 33, no. 4 (2009): 718–738; D.H. Shah et al, "Genetic Basis of Salmonella Enteritidis Pathogenesis in Chickens," *Producing Safe Eggs* (2016): 187–208.

Like *Infantis*, *Enteritidis* has seen a dramatic increase in overall antibiotic resistance. In 2014, 3.2 percent of *Enteritidis* isolates showed antibiotic resistance, versus 70.6 percent in 2025 (see Figure 13).

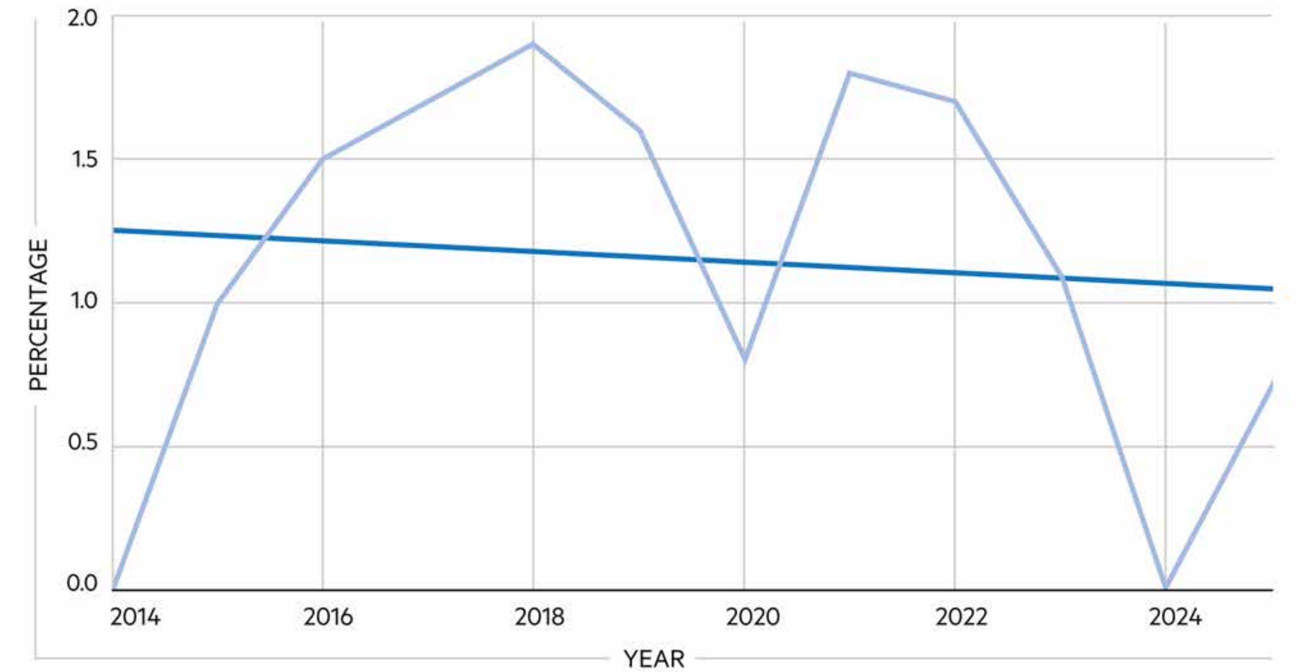
Figure 13. Antibiotic Resistance Trend in *Enteritidis* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Although multidrug resistance in *Enteritidis* was 0.7 percent in 2025 up from 0.0 percent in 2014, the trendline for 2014–2025 shows that there has been a slight overall decrease in multidrug resistance (see Figure 14).

Figure 14. Multidrug Resistance Trend in *Enteritidis* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

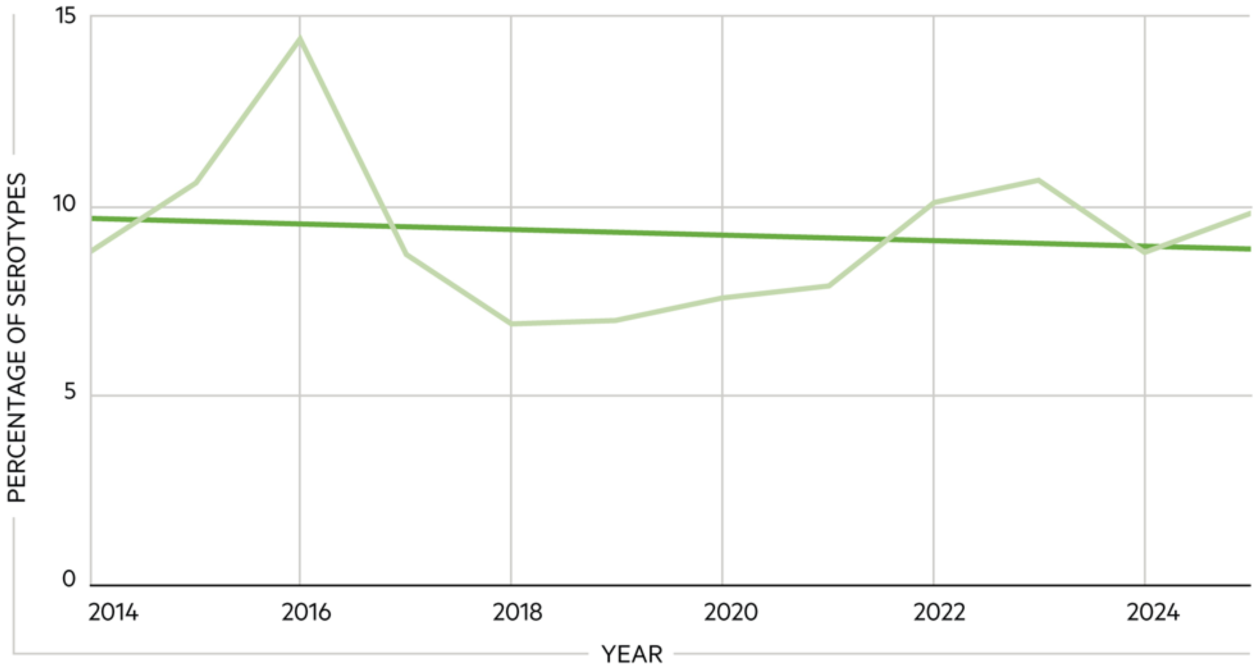
Like *Infantis*, *Enteritidis* has seen a rise in decreased susceptibility to ciprofloxacin: from 2 percent in 2017 to 64 percent in 2024.[65]

Salmonella Typhimurium: The Master Adapter

Salmonella Typhimurium accounts for a smaller share of poultry isolates than *Infantis* or *Enteritidis*, but remains a well-established and highly adaptable serotype. It has increased slightly from 2014, when it accounted for 8.8 percent of isolates, to 9.8 percent of isolates in 2025 (see Figure 15).

65 Jovita Haro et al., "Increase in the Frequency of Salmonella Enteritidis with Decreased Susceptibility to Ciprofloxacin," USDA FSIS, November 22, 2024.

Figure 15. Prevalence of *Typhimurium* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

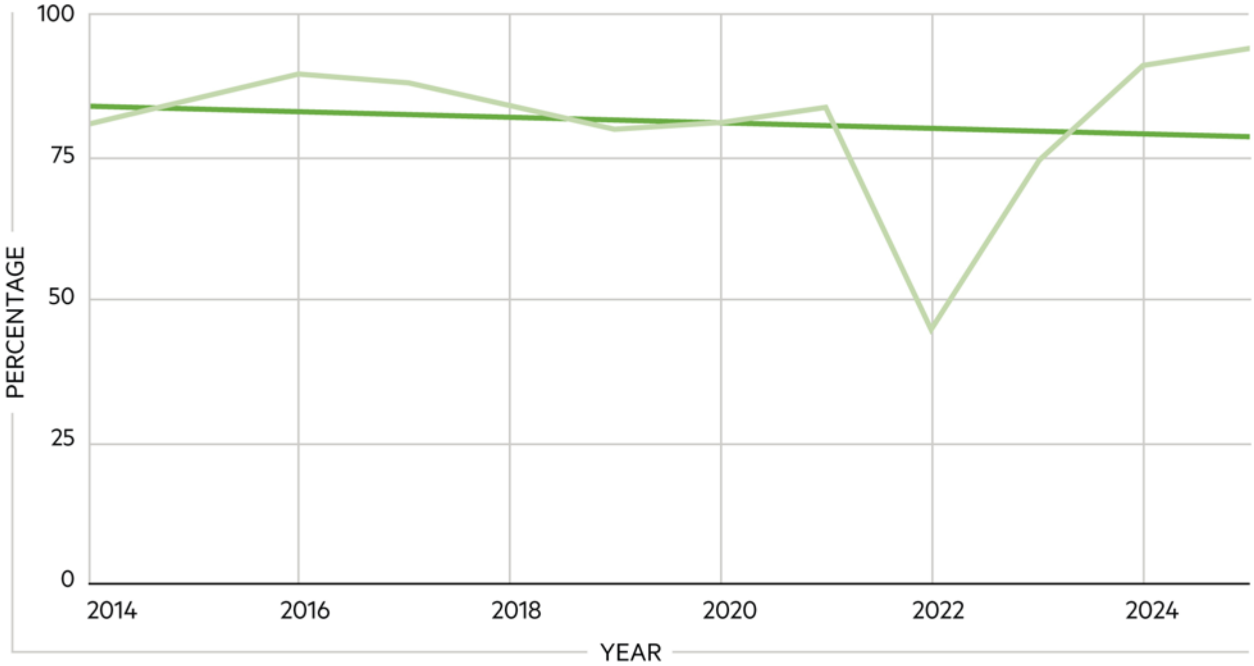
Its persistence and adaptability are largely due to the fact that it can live in a wide range of environments and infect many different hosts.[66] *Typhimurium* has been found in farmed animals, wild animals, and even on plants, and it can survive across a wide range of temperatures, allowing it to move readily through the production chain from farm to processing plant to home kitchen.[67] Once it enters the human body, it is especially efficient at colonizing the gut and invading cells, using a complex toolkit to evade defenses and establish infection. In simple terms, it is not just common; it is highly skilled at making people sick.

Unlike *Infantis* and *Enteritidis*, which have shown dramatic increases in antibiotic resistance, *Typhimurium* has consistently maintained high levels of resistance. In 2025, 94.3 percent showed antibiotic resistance, compared to 81.2 percent in 2014, with the trendline across all years showing a very slight decrease (see Figure 16).

66 Blanca M. Perez-Sepulveda and Jay C. D. Hinton, "Microbe Profile: Salmonella Typhimurium: The Master of the Art of Adaptation," *Microbiology* 171, no. 1 (2025).

67 Although *Typhimurium* is adept at persisting in the environment, unlike some other serotypes, it might be more susceptible to industry control efforts because it more frequently causes disease in young chicks, potentially making infections easier to detect and target earlier in production.

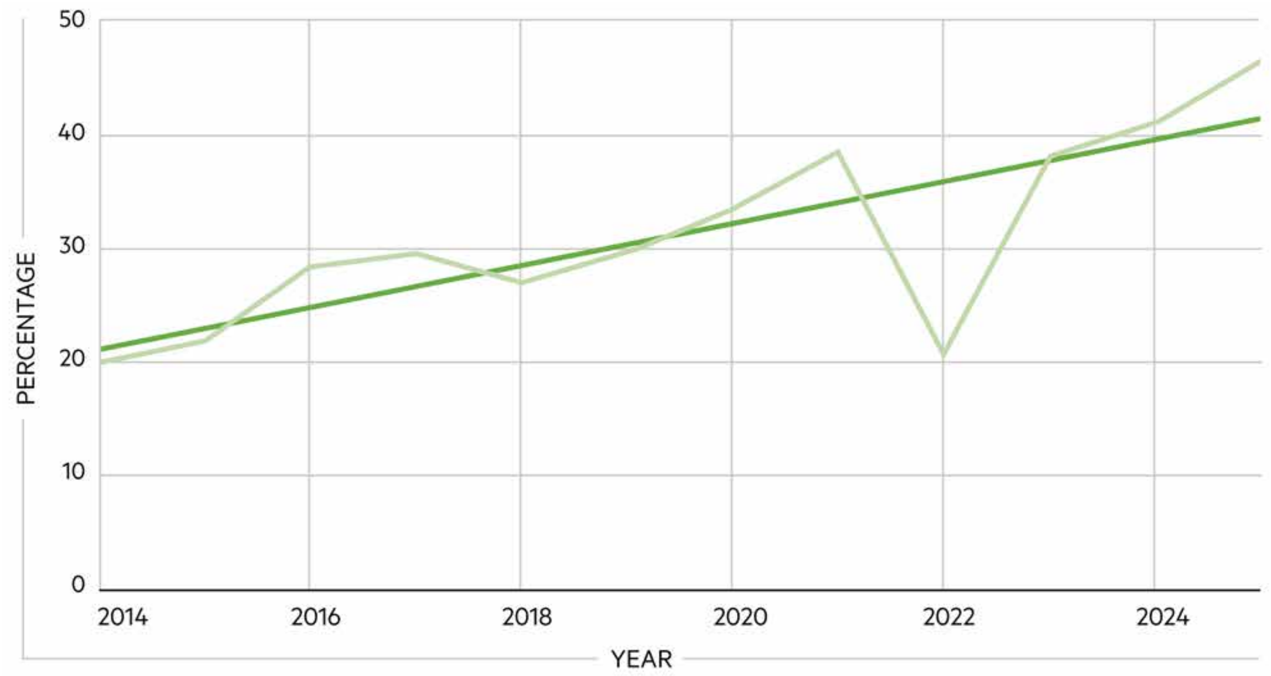
Figure 16. Antibiotic Resistance Trend in *Typhimurium* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

While antibiotic resistance has remained consistently high, multidrug resistance has increased. In 2014, 20.0 percent of positive samples were multidrug resistant, versus 46.5 percent in 2025 (see Figure 17).

Figure 17. Multidrug Resistance Trend in *Typhimurium* (2014–2025)



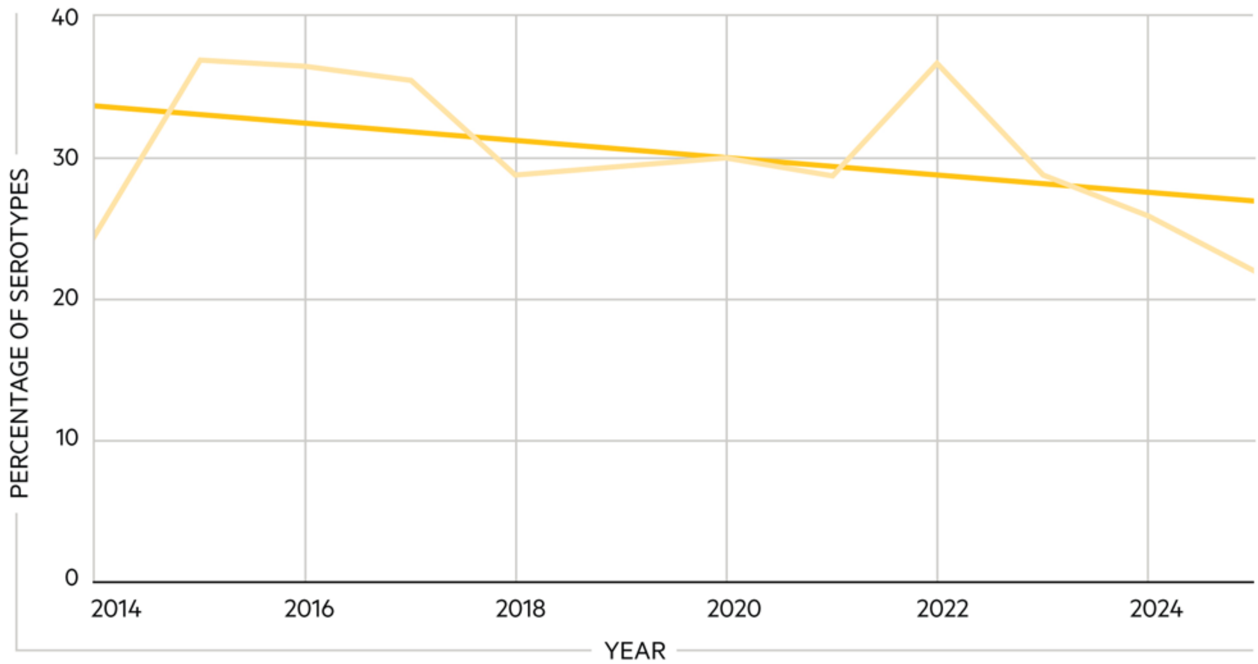
Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

These trends indicate sustained, near-universal antibiotic resistance in circulating strains, with well over a third multidrug resistant.

Salmonella Kentucky: The Background Reservoir

Salmonella Kentucky represents a different case. Despite accounting for more than one-fifth of poultry isolates—22 percent in 2025, down from 24.5 percent in 2014 (see Figure 18)—it is classified by the CDC as a low-virulence serotype with relatively low direct risk to human health. However, this belies the real risk it poses to antibiotic resistance.

Figure 18. Prevalence of *Kentucky* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

The presence of different salmonella serotypes carrying distinct antibiotic-resistance genes in the same poultry environment creates far more than an isolated contamination problem. Those poultry facilities become potential hotbeds for the evolution and spread of more complex and harder-to-treat bacteria.[68]

Salmonella strains circulating on farms and in processing facilities do not exist in isolation. They share space on surfaces, in water, in animals, and on equipment, and crucially, they can exchange genetic material that encodes resistance to antibiotics. In bacteria, genetic elements move from one strain to another, meaning resistance traits can combine in ways that make infections in people harder to cure.[69]

This is the danger posed by antibiotic resistance and multidrug resistance in *Kentucky*. Whether or not a serotype is "high virulence," antibiotic resistance genes are mobile and can transfer to other, more virulent serotypes, and even to other bacteria (like E. coli), through

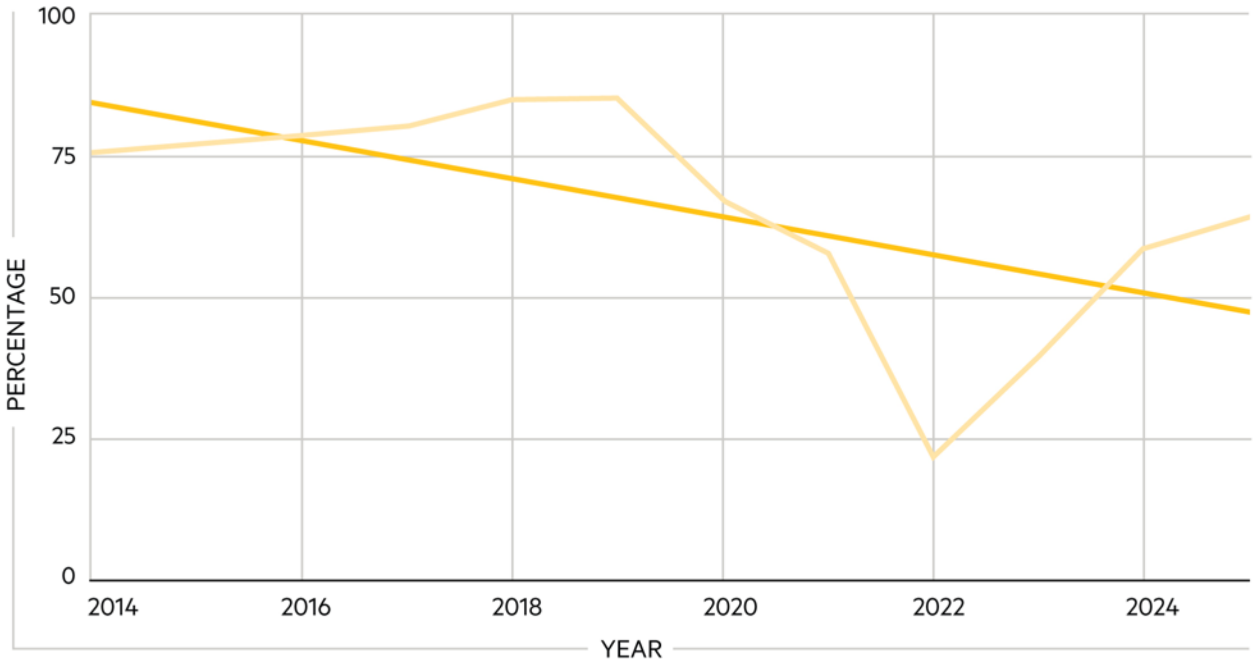
68 H. Oh et al., "Antibiotic-Resistant Salmonella in Animal Products Jeopardize Human Health," *Food Science of Animal Resources* 45, no. 2 (2025): 409-428.

69 Gang Liu et al,, "Antimicrobial-induced Horizontal Transfer of Antimicrobial Resistance Genes in Bacteria: A Mini-review," *Journal of Antimicrobial Chemotherapy* 77, no. 3 (2022): 556–567; G.I. Krüger et al., "Mobile Genetic Elements Drive the Multidrug Resistance and Spread of Salmonella Serotypes Along a Poultry Meat Production Line," *Frontiers in Microbiology* 14 (2023): v1072793.

a process called horizontal gene transfer.[70] If *Kentucky* transfers antibiotic resistance to serotypes most likely to make people sick, and people sickened by those virulent serotypes need antibiotics, the drugs typically used to treat those strains may no longer work. *Kentucky* conferring resistance to serotypes like *Enteritidis, Typhimurium, and Infantis* is already well-documented, making this a real—not just hypothetical—problem.[71]

Although *Kentucky* is the only serotype in the top four where both antibiotic resistance and multidrug resistance have declined, its antibiotic resistance levels remain substantial. In 2014, 75.2 percent of *Kentucky* isolates were resistant to antibiotics, and in 2025, 64.0 percent remained so. (see Figure 19).

Figure 19. Antibiotic Resistance Trend in *Kentucky* (2014–2025)



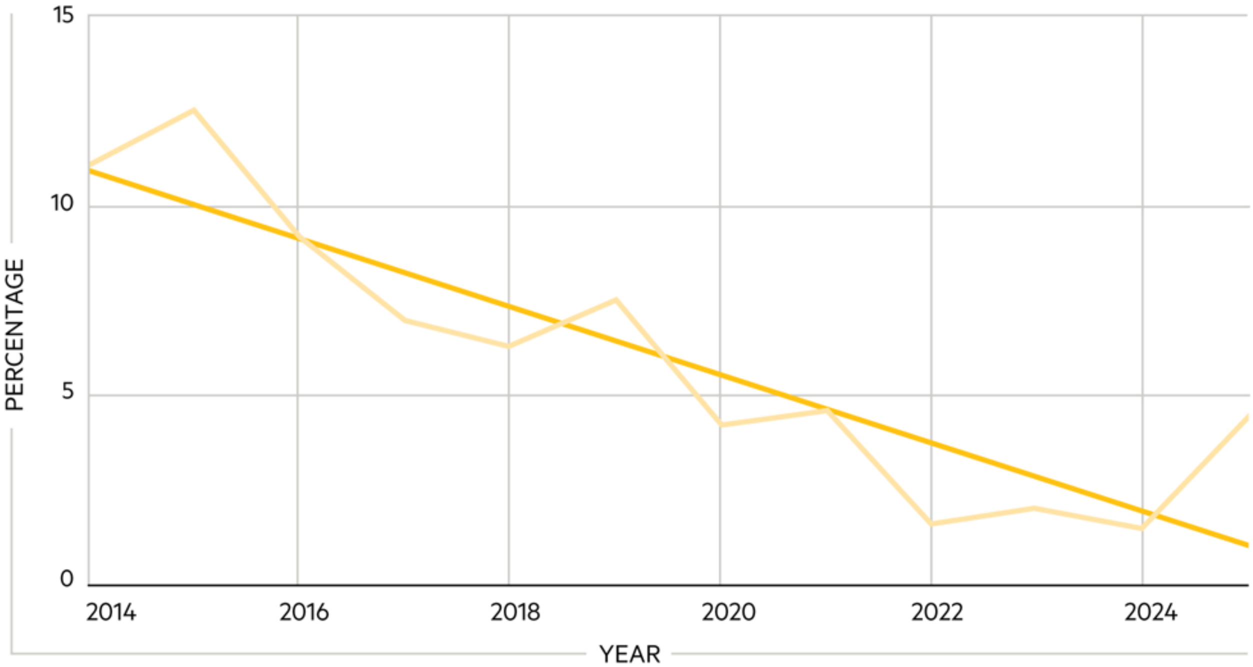
Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Multidrug resistance has also declined, with 11.1 percent of positive samples multidrug resistant in 2014, versus 4.4 percent in 2025 (see Figure 20).

70 W.F. Fricke et al., "Antimicrobial Resistance-conferring Plasmids with Similarity to Virulence Plasmids from Avian Pathogenic Escherichia coli strains in Salmonella Enterica Serovar Kentucky Isolates from Poultry," *Applied Environmental Microbiology* 75, no. 18 (2009): 5963-71; T.J. Johnson et al., "Horizontal Gene Transfer of a ColV Plasmid has Resulted in a Dominant Avian Clonal Type of Salmonella Enterica Serovar Kentucky," *PLoS One* 5, no. 12 (2010): e15524; Bijay K. Khajanchi and Steven L. Foley, "Antimicrobial Resistance and Increased Virulence of Salmonella," *Microorganisms* 10, no. 9 (2022): 1829; G.I. Krüger et al., "Mobile Genetic Elements Drive the Multidrug Resistance and Spread of Salmonella Serotypes Along a Poultry Meat Production Line," *Frontiers in Microbiology* 14 (2023): v1072793; Gang Liu et al., "Antimicrobial-induced Horizontal Transfer of Antimicrobial Resistance Genes in Bacteria: A Mini-review," *Journal of Antimicrobial Chemotherapy* 77, no. 3 (2022): 556–567.

71 T.N. Bythwood et al., "Antimicrobial Resistant Salmonella Enterica Typhimurium Colonizing Chickens: The Impact of Plasmids, Genotype, Bacterial Communities, and Antibiotic Administration on Resistance," *Frontiers in Sustainable Food Systems* 3, no. 20 (2019); Haijiao Lin et al., "Detection of Plasmids in Salmonella from Poultry and Investigating the Potential Horizontal Transfer of Antimicrobial Resistance and Virulence Genes: Plasmid Transfer of Resistance and Virulence," *Poultry Science* 104, no. 1 (2025): 104591; T.J. Johnson et al., "Horizontal Gene Transfer."

Figure 20. Multidrug Resistance Trend in *Kentucky* (2014–2025)



Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

Notably, Kentucky's prevalence in the poultry industry's salmonella landscape appears to be diminishing over time. While it remains a substantial share of isolates, its proportion has declined as *Infantis* and *Enteritidis* have multiplied and now dominate the poultry-associated salmonella most likely to cause serious illness in people. In other words, *Kentucky* is becoming less central as a driver of overall contamination patterns, even as it continues to function as a widespread background reservoir for resistance within a system increasingly defined by a smaller number of more virulent, more antibiotic-resistant serotypes.

Collectively, these findings indicate that the poultry industry's salmonella risk is becoming increasingly concentrated in a relatively small number of high-virulence, antibiotic-resistant serotypes. An important remaining question is whether these pathogens are distributed broadly across poultry production or concentrated within particular processing establishments. The following analysis therefore examines plant-level FSIS surveillance data to assess where these high-risk strains are occurring.

MAJOR POULTRY COMPANIES' FACILITIES *ARE AMONG THE HIGHEST-RISK SOURCES OF HIGH-VIRULENCE, ANTIBIOTIC-RESISTANT SALMONELLA IN THE FOOD SUPPLY*

To understand where risk is highest in the poultry industry, we analyzed FSIS data of processing plants. It revealed a clear pattern: salmonella risk in the poultry industry is not evenly distributed across facilities. Instead, a subset of production facilities repeatedly emerges as having the industry's most concerning contamination patterns, even as similar risk factors persist across the broader industrial poultry system. In addition to testing positive for high rates of salmonella, these plants are also more likely to harbor contamination profiles dominated by serotypes most associated with serious human illness and antibiotic resistance.

However, these facilities should not be understood as "bad actors" detached from the broader production system. Rather, they represent points where broader industry-wide risk factors become concentrated. The poultry industry operates under shared structural conditions that can increase opportunities for pathogen emergence, transmission, and persistence, including genetically uniform flocks with limited resilience to infection, high stocking densities that facilitate rapid pathogen transmission, stressful production conditions that can compromise animal health, and processing systems designed for speed and scale.

Variation in plant-level outcomes does not negate this structural risk. Differences across facilities reflect variation in how companies manage, enforce, and operationalize food safety practices within the same production constraints. The presence of both higher- and lower-performing plants reflects not the absence of systemic risk, but its uneven expression across a shared production model.

Across the 2014–2025 surveillance data, the same facilities appear again and again among the highest-risk plants in the country. Some repeatedly rank poorly for overall contamination while also showing elevated levels of high-virulence serotypes, such as *Infantis*, *Enteritidis*, and *Typhimurium*. Many of these same plants also show high levels of antibiotic resistance and multidrug resistance. Although some facilities rank consistently as the highest-risk, contamination and resistance patterns also shift across plants and companies over time, suggesting that these risks are linked not only to individual plant performance but also to broader production conditions shared throughout the industry.

Plant-specific findings challenge the idea that overall industry-wide contamination averages are sufficient for evaluating public health danger. Two plants may report similar contamination levels while posing very different risks depending on which serotypes they host and whether those strains are resistant to antibiotics. Looking only at overall contamination rates obscures the fact that some facilities consistently produce contamination profiles that are substantially more dangerous than others.

Our analysis first examined three variables and identified the highest-risk plants in each: level of contamination, concentration of high-virulence serotypes, and prevalence of antibiotic resistance and multidrug resistance. From there, we analyzed these metrics together to identify the highest-risk plants overall.

Plants with the Highest Contamination

Birds at certain poultry plants have consistently high salmonella contamination rates year after year, indicating that contamination is not the result of one-off breakdowns but reflects persistent conditions that enable pathogen introduction, survival, and transmission.

A high-level analysis of the top 25 plants with the largest percentage of contaminated birds in 2025 shows that some of the largest and most recognizable companies had alarmingly high rates of contamination that year (see Figure 21 for the full list):

Butterball's Carthage, Missouri plant (P8727):
48.8% Contamination rate of nearly 1 in 2 samples **(Ranked #13)**

Perdue's Washington, Indiana plant (P286):
31.9% Contamination rate of nearly 1 in 3 samples **(Ranked #10)**

Perdue's Rockingham, North Carolina plant (P1243):
24.8% Effectively 1 in 4 samples **(Ranked #1)**

Perdue's Georgetown, Delaware plant (P2178):
21.7% More than 1 in 5 samples **(Ranked #3)**

Pitman Family Farms (which sells chicken under the Mary's Chicken label at premium retailers like Whole Foods) **Sanger, California plant** (P27389):
21.6% More than 1 in 5 samples **(Ranked #2)**

These contamination rates are very concerning on their own, but they reflect only the level in that particular year. In identifying the highest risk establishments, a higher contamination percentage in 2025 does not automatically make a plant rank worse overall. To more accurately assess risk based on contamination, we used a time-weighted score designed to capture both the severity and consistency of contamination going back to 2014, while giving more importance to recent results. This means that a plant with a moderate contamination rate in 2025 may still rank higher than another plant with a higher 2025 contamination percentage if the moderately contaminated plant has a longer or more persistent history of contamination, more positive tests overall, or consistently poor performance across recent years. This explains why Perdue's P286 has a 2025 contamination rate of 31.9 percent and ranks #10, while Perdue's P1243 ranks #1 with a 2025 contamination rate of 24.8 percent.

Figure 21 provides the full list of the 25 most contaminated plants out of all poultry plants inspected by FSIS, showing the percentage of positive tests, the time-weighted score that gives more weight to recent performance while still considering past years, and how many years from 2014–2025 the plant has appeared among the top 25 most contaminated. In short, it highlights which plants consistently have the highest rates of contamination, especially in the most recent data, while also showing whether those problems have been ongoing over time.[72]

72 For this assessment, a time-weighted score was calculated to account for the number of positive tests as follows: first, calculate a base score: base_score = # positive tests * log(total tests + 1); second, calculate a weighted score that accounts for a deprecation of importance the further back in time the test occurred (a "half-life" of 3 years was defined such that every three years the weight drops by half); third, multiply the base score by the year weight to arrive at a weighted score that accounts for time deprecation; fourth, arrange the weighted score in descending order to arrive at a Top 25 list per year.

Figure 21: Top Plants for the Highest Rates of Contaminated Birds in 2025

COMPANY NAME	PLANT NUMBER	PERCENT CONTAMINATION	TIME-WEIGHTED SCORE	YEARS IN TOP 25 PLANTS
Perdue Foods, LLC	P1243	24.8%	221.8	9
Pitman Farms	P27389	21.6%	190.5	9
Perdue Foods, LLC	P2178	21.7%	190.2	9
Gerber Poultry, LLC	P20604	19%	164.2	7
Red Bird Farms Dist Co	P8139	29%	133.8	4
Fieldale Farms Corporation	P1250	13.2%	131.2	5
Ihsan Farms, LLC	P46897	49.2%	128.9	6
Cargill Meat Solutions	P18	33.3%	119	6
La Belle Farms, Inc	P19150	57.7%	99.5	4
Perdue Foods, LLC	P286	31.9%	98.7	5
Martin's Specialty Sausage Co, Inc	P5351	33.3%	92.5	4
James River Correctional Center	P31843	65.7%	82.4	5
Butterball, LLC	P8727	48.8%	79.5	5
Diestal Turkey Ranch	P157	27.7%	60.1	5
Prestage Foods, Inc	P22000	10.7%	40	5
Tyson Foods, Inc	P806	6.9%	38	5
Cargill Meat Solutions	P963	14.8%	32.1	4
Gold Creek Processing, LLC	P27505	8.8%	25.4	6
Mar-Jac Poultry-MS	P517	4.6%	23.5	4
Pilgrim's Pride Corporation	P2632	3.6%	18.8	5
Perdue Foods, LLC	P764	4.8%	17.7	4
Tyson Foods, Inc	P1	2.7%	14.2	4
Pilgrim's Pride Corporation	P206	3.3%	13.6	5
Mar-Jac Poultry, Inc	P32	1.9%	9.3	4
Sanderson Farms, Inc	P34308	2%	9.2	5

Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

These rankings show that high rates of contamination are not isolated incidents or temporary lapses in salmonella control measures at these plants; they are recurring patterns that persist across years of federal salmonella testing data. While some establishments consistently rank among the worst performers, the broader distribution of contamination across the industry signals that these plants represent the most visible concentration of risks embedded throughout industrial poultry production rather than wholly exceptional cases. The differences are of degree, not of kind.

These findings on contamination levels establish the extent of contamination observed, providing the foundation for the analyses of serotype distribution and antibiotic resistance/multidrug resistance that follows. Because contamination is the pathway through which dangerous salmonella strains enter the food supply, plants with persistent contamination create repeat opportunities for consumers to be exposed to salmonella generally, and potentially to more-virulent, more-resistant strains that are more difficult to treat when infections do occur.

Plants with the Highest Prevalence of High-Virulence Serotypes

In compiling data on the plants with the highest rates of high-virulence serotypes, our analysis of risk moves from salmonella *frequency* to *severity*. Here the picture becomes even more alarming than the high rates of contamination discussed above. High-virulence serotypes most likely to cause human illness overwhelmingly dominate salmonella strains at the plants on this list.

The plants with the highest contamination levels also have the highest prevalence of high-virulence serotypes:

Perdue

88.3% at **Perdue's P1243 plant** (ranked **#1** for overall prevalence)

83.3% at **Perdue's P2178 plant** (ranked **#3** for overall prevalence)

47.8% at **Perdue's P286 plant** (ranked **#12** for overall prevalence)

BUTTERBALL

85.7% at **Butterball's P8727 plant** (ranked **#10** for overall prevalence)

Pitman Family Farms

81% at **Pitman Farms' P27389 plant** (ranked **#2** for overall prevalence)

Figure 22 shows the plants with the highest prevalence of *high-virulence* serotypes in 2025. As with the list of most contaminated plants, we calculated time-weighted scores that consider past years and give more weight to recent performance.[73]

Figure 22: Top Plants for the Highest Rates of High-Virulence Serotypes in 2025

COMPANY NAME	PLANT NUMBER	PERCENT HIGH VIRULENCE	TIME-WEIGHTED SCORE	YEARS IN TOP 25 PLANTS
Perdue Foods, LLC	P1243	88.3%	143.8	9
Pitman Farms	P27389	81%	109.1	9
Perdue Foods, LLC	P2178	83.3%	108.3	9
Ihsan Farms, LLC	P46897	80.6%	86.6	8
Gerber Poultry, LLC	P20604	75%	83.9	6
Red Bird Farms Dist Co	P8139	79.3%	78.2	4
Fieldale Farms Corporation	P1250	84%	68.4	4
James River Correctional Center	P31843	78.2%	57.2	8
Martin's Specialty Sausage Co, Inc	P5351	81.8%	56.4	8
Butterball, LLC	P8727	85.7%	55.6	6
Cola Foods, LLC	P5268	88.2%	43.4	3
Cargill Meat Solutions	P18	40.7%	36.7	4
Empire Kosher Poultry, Inc	P1015	60%	36.5	4
Perdue Foods, LLC	P286	47.8%	35	4
Heatherfield Foods, LLC	P4846	85.7%	32.5	3
Diestal Turkey Ranch	P157	73.3%	30.5	3
Prestage Foods, Inc	P22000	66.6%	13.8	5
Cargill Meat Solutions	P963	62.5%	11	3
Tyson Foods, Inc	P806	62.5%	11	7
Gold Creek Processing, LLC	P27505	83.3%	9.7	6
DiLuigi Foods, Inc	P4398	100%	9	4
Perdue Foods, LLC	P764	75%	4.8	4
Pilgrim's Pride Corporation	P2632	50%	3.2	4
Tyson Foods, Inc	P1	66.6%	2.8	5

Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

73 For this assessment, a time-weighted score was calculated to account for the number of overall high-virulence tests among all positive tests as follows: first, calculate a base score: base_score = # positive tests * log(total tests + 1); second, calculate a weighted score that accounts for a deprecation of importance the further back in time the test occurred (a "half-life" of 3 years was defined such that every three years the weight drops by half); third, multiply the base score by the year weight to arrive at a weighted score that accounts for time deprecation; fourth, arrange the weighted score in descending order to arrive at a Top 25 list per year.

These findings on the prevalence of high-virulence serotypes mark a critical shift in the analysis, from how often salmonella is present to how dangerous the contamination may be once exposure occurs. A plant with frequent contamination is concerning on its own, but public health stakes rise substantially when the overwhelming majority of isolates belong to serotypes most associated with human illness. At many of the plants ranked most highly contaminated in this analysis, high-virulence strains dominate the salmonella population circulating within the facility. The repeated overlap between contamination rankings and the virulence rankings is especially troubling because it suggests that some establishments with persistent contamination repeatedly harbor contamination profiles dominated by strains more likely to cause hospitalization, invasive infection, and death. Yet the repeated appearance of these serotypes across multiple companies and plants also points to a level of risk embedded in routine, everyday industry operations.

Plants with the Highest Rates of Antibiotic Resistance

Beyond salmonella *frequency* and *severity*, the risk is compounded by *treatability*—in other words, whether a consumer who is made ill by a product contaminated with high-virulence salmonella from one of these plants can be effectively treated. Our time-weighted analysis of antibiotic resistance identified the plants with the highest rates of antibiotic resistance (defined as resistance to one or two antibiotic classes).[74] The results show that many plants exhibit extremely high rates of antibiotic resistance in the tested samples (see Figure 23). Several have 100 percent antibiotic resistance in tested 2025 samples, including Perdue's P764 plant and two of Tyson's plants (however, because these three plants' longer-term rates of antibiotic resistance have been lower in the past, they rank lower in the list).

The same plants from top poultry companies that appear in both the highest rates of contamination and highest rates of high-virulence serotypes lists also rank in the list of top plants for antibiotic resistance rates:

90.7% at **Perdue's P1243 plant** (ranked **#1** for antibiotic resistance)

91.8% at **Perdue's P2178 plant** (ranked **#2** for antibiotic resistance)

43.4% at **Perdue's P286 plant** (ranked **#12** for antibiotic resistance)

64.8% at **Pitman Farms' P27389 plant** (ranked **#4** for antibiotic resistance)

61.9% at **Butterball's P8727 plant** (ranked **#11** for antibiotic resistance)

74 For this assessment, a time-weighted score was calculated to account for the number of overall antibiotic resistance among all positive tests as follows: 1) first, calculate a base score: base_score = # positive tests * log(total tests + 1); second, calculate a weighted score that accounts for a deprecation of importance the further back in time the test occurred (a "half-life" of 3 years was defined such that every three years the weight drops by half); third, multiply the base score by the year weight to arrive at a weighted score that accounts for time deprecation; fourth, arrange the weighted score in descending order to arrive at a Top 25 list per year.

Figure 23: Top Plants for the Highest Rates of Antibiotic Resistance in Salmonella Overall in 2025

COMPANY NAME	PLANT NUMBER	PERCENT ANTIBIOTIC RESISTANT	WEIGHTED ANTIBIOTIC RESISTANCE SCORE
Perdue Foods, LLC	P1243	90.7%	147.6
Perdue Foods, LLC	P2178	91.8%	123.7
Ihsan Farms, LLC	P46897	83.8%	90.1
Pitman Farms	P27389	64.8%	109.1
Gerber Poultry, LLC	P20604	75%	83.9
Cargill Meat Solutions	P18	88.8%	80.0
La Belle Farms, Inc	P19150	76.9%	65.9
James River Correctional Center	P31843	86.9%	63.6
Fieldale Farms Corporation	P1250	68%	55.4
Martin's Specialty Sausage Co, Inc	P5351	72.7%	50.2
Butterball, LLC	P8727	61.9%	40.2
Perdue Foods, LLC	P286	43.5%	31.8
Pelleh Poultry Corporation	P44121	100%	27.3
Diestal Turkey Ranch	P157	60%	25.0
Joyce Foods, Inc	P7428	90%	21.6
Isernio's Sausage Co	P1542	100%	17.6
Tyson Foods, Inc	P806	100%	17.6
Prestage Foods, Inc	P22000	77%	16.1
Perdue Foods, LLC	P764	100%	6.4
Allen Harim, LLC	P935	75%	4.8
Tyson Foods, Inc	P1	100%	4.2
Gold Creek Processing, LLC	P27505	0%	0
Mar-Jac Poultry, Inc	P32	0%	0

Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

A finding of resistance to even one or two antibiotic classes in a poultry production system is a significant indicator of risk. The ongoing presence of antibiotic-resistant salmonella indicates that resistance traits have become established within portions of the poultry production system and persist despite existing control measures. Consistently high antibiotic resistance rates are an important warning sign about the public health risks posed by these plants, both for the treatability of individual infections and for how resistance could accumulate and spread through the food supply chain before turning into more dangerous multidrug-resistant strains.

Plants with the Highest Rates of Multidrug Resistance

The rate of contamination reflects salmonella *frequency*, the serotype gives us information on *likelihood and severity of infections*, and antibiotic resistance dictates *treatability*. The prevalence of *multidrug* resistance at a plant gives us additional information on the difficulty of *treatability*, but at this stage it moves further into the realm of *systemic public health concern*—that is, multidrug-resistant salmonella infections will be harder to treat (a concern for an infected individual) *and* the risk posed by poultry plants in contributing to the global crisis of antibiotic resistance increases exponentially the more multidrug resistance it evidences, jeopardizing the effectiveness of critical antibiotics over time.

With multidrug resistance, there is a slight shift in which plants rise to the top (see Figure 24 for full list). Multidrug-resistant isolates at the same well-known companies' plants account for high percentages of overall contamination (with the exception of Perdue's P286 plant, which has a lower rate of multidrug resistance):

37.2% at **Perdue's P1243 plant** (ranked **#2** for multidrug resistance)

43.2% at **Perdue's P2178 plant** (ranked **#3** for multidrug resistance)

4.3% at **Perdue's P286 plant** (ranked **#19** for multidrug resistance)

27% at **Pitman Farms' P27389 plant** (ranked **#7** for multidrug resistance)

19% at **Butterball's P8727 plant** (ranked **#13** for multidrug resistance)

Figure 24: Top Plants for the Highest Rates of Multidrug Resistance Overall in 2025

COMPANY NAME	PLANT NUMBER	PERCENT MULTIDRUG RESISTANT	WEIGHTED MULTIDRUG RESISTANCE SCORE
Ihsan Farms, LLC	P46897	61.2%	65.8
Perdue Foods, LLC	P1243	37.2%	60.5
Perdue Foods, LLC	P2178	43.2%	58.2
Fieldale Farms Corporation	P1250	48%	39.1
James River Correctional Center	P31843	52.1%	38.1
Red Bird Farms Dist Co	P8139	37.9%	37.4
Pitman Farms	P27389	27%	36.4
Martin's Specialty Sausage Co, Inc	P5351	50%	34.5
Cola Foods, LLC	P5268	58.8%	28.9
Gerber Poultry, LLC	P20604	21.8%	24.5
Empire Kosher Poultry, Inc	P1015	35%	21.3
Heatherfield Foods, LLC	P4846	42.8%	16.2
Butterball, LLC	P8727	19%	12.4
Cargill Meat Solutions	P18	11.1%	10.0
Prestage Foods, Inc	P22000	44.4%	9.2
Perdue Foods, LLC	P764	100%	6.4
Tyson Foods, Inc	P806	25%	4.4
DiLuigi Foods, Inc	P4398	40%	3.6
Perdue Foods, LLC	P286	4.3%	3.2
Diestal Turkey Ranch	P157	6.6%	2.8
Tyson Foods, Inc	P1	66.6%	2.8
Cargill Meat Solutions	P963	12.5%	2.2
Gold Creek Processing, LLC	P27505	0%	0.0
Pilgrim's Pride Corporation	P2632	0%	0.0

Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

When an infection is resistant to one or two antibiotic classes, options for treatment become more limited, but when an infection is resistant to three or more antibiotic classes treatment options narrow rapidly. This multidrug resistance is especially concerning because it reduces treatment options *and* it helps resistance persist and spread over time. Multidrug-resistant bacteria are more likely to survive antibiotic exposure, continue multiplying, and circulate longer in poultry production systems, increasing opportunities for transmission and for the exchange of resistance genes between bacterial populations.

As resistant bacteria multiply in and overtake these environments, resistance genes can circulate and transfer beyond the poultry industry, undermining the effectiveness of drugs relied upon to treat serious infections. In this sense, multidrug resistance becomes more than a marker of risk at an individual plant or a measure of how difficult a salmonella infection may be to treat in a single patient. It signals a warning that the poultry industry itself may be accelerating the loss of antibiotic effectiveness on a global, population-level scale.

The Highest-Risk Plants Across All Metrics

Viewed independently, each metric captures a different dimension of salmonella risk: contamination frequency affects the likelihood of exposure, serotype provides insight into potential severity of illness, and antibiotic resistance and multidrug resistance indicate how difficult infections may be to treat, as well as how infections linked to these systems may contribute to the broader global antibiotic resistance crisis. However, the most concerning establishments are those that perform poorly across all metrics simultaneously: repeatedly test positive, harbor more virulent serotypes, and exhibit elevated levels of antibiotic resistance and multidrug resistance. Most of the companies in each single-metric ranking also appear on the overall highest-risk list, revealing persistent failures to control salmonella across multiple risk dimensions rather than isolated weaknesses in a single area.

The consistency of these rankings over time is particularly significant. If contamination and resistance patterns were random or evenly distributed throughout the industry, the highest-risk plants would shift substantially from year to year. Instead, many of the same establishments continue to rank among the worst performers, whether the analysis examines the full 2014–2025 period or only the most recent year of data.

To identify the overall highest-risk facilities, we developed a risk scoring system for both 2025 and a long-term comparison.[75] Based on this scoring, we created a list of the highest-risk establishments (see Figure 25). Top poultry companies that ranked high in the three single metrics also rank high in overall risk (although Butterball has moved further down):

Perdue's P1243 plant ranks #1

Perdue's P2178 plant ranks #2

Pitman's P27389 plant ranks #4

Butterball's P8727 plant ranks #22

Eight plants on the list scored in the top 25 in *both* 2025 and the long-term comparison, including Perdue's P1243 and P2178 plants and Butterball's P8727 plant, highlighting chronic high risk across years.

75 **Composite Risk Scoring Methodology for Establishment Ranking:** To identify establishments with consistently elevated risk profiles, we developed a composite scoring framework integrating multiple dimensions of risk, including contamination rate, virulence potential, antimicrobial resistance and multidrug resistance. **Time-Weighted Metric Construction:** For each dimension, establishment-level scores were first calculated using a time-weighted approach that accounted for both testing volume and recency. Specifically, counts of positive outcomes were scaled by the logarithm of total tests to reduce the influence of low-sample observations, and then multiplied by an exponential decay function to assign greater weight to more recent years. This approach ensures that establishments with persistently high counts and recent adverse outcomes are prioritized. **Rank-Based Normalization:** Because the resulting weighted scores vary in scale and distribution across risk dimensions, direct aggregation is not appropriate. To address this, each metric was transformed using a percentile rank (percent_rank), which maps values to a standardized 0–1 scale based on their relative standing within the distribution. This approach is robust to skewed distributions and outliers, and allows for meaningful comparison across heterogeneous metrics. **Composite Score Calculation:** An overall risk score was calculated as the mean of the percentile ranks across all four dimensions (contamination, virulence, antibiotic resistance, and multidrug resistance). This produces a composite measure reflecting the relative severity of each establishment across multiple independent risk factors. **Consistency Adjustment:** To further prioritize establishments exhibiting consistently high risk across multiple dimensions, a "consistency penalty" was incorporated. Establishments were assigned an additional increment to their composite score based on the number of individual metrics for which they exceeded the 80th percentile. This adjustment emphasizes establishments that are not only high-risk in a single dimension but demonstrate systemic or multi-faceted risk patterns. **Rationale:** This rank-based composite approach avoids the limitations of scale-dependent aggregation and reduces sensitivity to extreme values, while the consistency adjustment ensures that establishments with broad-based risk profiles are appropriately elevated in the final ranking. Together, these methods provide a stable and interpretable framework for identifying high-priority establishments for further investigation or intervention. **Identification of High-Risk Establishments:** To identify establishments for targeted follow-up, we evaluated performance using two complementary perspectives: long-term risk and current risk (2025). **Long-term risk** reflects sustained patterns of elevated contamination, virulence, and antimicrobial resistance over time. These scores incorporate time-weighting and are averaged across years to identify establishments with consistently poor performance. **Current risk (2025)** reflects the most recent observed conditions and highlights establishments with elevated risk in the latest year of data. Establishments were ranked separately under each framework. Those appearing in the top tier of both rankings were flagged as highest priority, indicating both persistent and recent elevated risk. Establishments appearing in only one list may represent either legacy concerns (historically high but recently improved) or emerging risks (recent deterioration).

Figure 25: Highest-Risk Plant Rankings (2025 with Long-Term Comparison)

Gray highlights indicate the plant ranked in the Top 25 in both 2025 and in the long-term comparison.

COMPANY NAME	PLANT NUMBER	2025 RANK	LONG-TERM RANK
Perdue Foods, LLC	P1243	1	3
Perdue Foods, LLC	P2178	2	6
Vital Foods, LLC	P18237	3	82
Pitman Farms	P27389	4	32
Ihsan Farms, LLC	P46897	5	1
Red Bird Farms Dist Co	P8139	6	44
Locust Point Farms, LLC	P39915	7	56
Fieldale Farms Corporation	P1250	8	51
Gerber Poultry, LLC	P20604	9	14
James River Correctional Center	P31843	10	10
Martin's Specialty Sausage Co, Inc	P5351	11	33
La Belle Farms, Inc	P19150	11	2
David Elliott Poultry Farm, Inc	P134	12	45
Al-Kawthar Poultry, LLC	P48466	13	103
Best Chicago Meat Company	P27353	14	57
Catelli Brothers	P8466	14	226
Pride Enterprise Food Products	P18506	15	228
Empire Kosher Poultry, Inc	P1015	16	16
Holly Poultry, LLC	P1305	17	95
Cargill Meat Solutions	P18	17	36
Trilogy Foods, LLC	P45638	18	238
Butterball, LLC	P8727	19	11
Omni Custom Meats, Inc	P2199	20	379
Wonder Meats Snyder, Inc	P1991	21	29
Cola Foods, LLC	P5268	58.8	28.9

Source: "Raw Poultry Sampling," USDA FSIS, accessed April 3, 2026.

The concentration of risk among specific facilities provides important insights into where salmonella hazards become most severe, but these rankings should not be interpreted as evidence that risk originates only at a small number of poorly performing plants. Rather, the data show how broader industry conditions can produce uneven outcomes across facilities. Some plants repeatedly emerge as the highest-risk locations because they operate within a production system where contamination, virulence, and resistance pressures are already present and can become concentrated over time.

The consistency of these rankings suggests that plant-level differences matter, but they occur within a shared industrial environment. Facilities vary in their ability to control contamination, limit the spread of high-risk strains, and manage food safety challenges; however, they do not operate independently from the broader conditions that shape salmonella risk across poultry production. The result is a system in which some facilities become recurring points of elevated risk, while others experience lower levels of contamination or resistance at particular points in time.

Overall, the plant-level findings demonstrate both the importance of identifying the highest-risk facilities and the limitations of focusing only on individual establishments. Prioritizing action at these plants is necessary to reduce immediate risks, but lasting reductions in salmonella contamination and the spread of high-virulence, antibiotic-resistant strains will require interventions that address the production conditions that allow these risks to persist. The recommendations that follow outline strategies to resolve both immediate risks and the broader drivers of salmonella contamination.

RECOMMENDATIONS

For years, the poultry industry and federal regulators have pointed to declining overall salmonella contamination rates as evidence that food safety efforts are working. But our analysis of FSIS surveillance data shows that this narrative obscures a more dangerous reality. Even as overall prevalence may fluctuate or decline, the presence of high-virulence, antibiotic-resistant, and multidrug-resistant strains continues to pose an outsized threat to public health, both through more severe foodborne illness and through the erosion of antibiotic effectiveness across a wide range of bacterial infections.

Addressing this challenge requires moving beyond incremental improvements and confronting the structural conditions that shape pathogen emergence in the industrial animal sector. The evidence indicates that disease risk is driven by downstream processing failures and, importantly, upstream production practices (e.g., breeders) that systematically favor the emergence, spread, and persistence of pathogens. At the same time, those pathogens grow increasingly antibiotic- and multidrug-resistant through the industrial animal sector's routine antibiotic use. The acceleration of antibiotic resistance far outpaces the ability of regulatory frameworks to intervene effectively, as regulators' authorities remain far too limited to produce the changes needed.

The most effective path forward, then, is twofold:

1. **Transform the conditions that enable pathogen proliferation at its source.** In practice, this means fundamentally redesigning the standard poultry production model that relies on overcrowding, genetic uniformity, high-speed processing, and unsanitary conditions, all of which together amplify disease transmission (while entrenching severely compromised welfare for the animals caught up in these systems).

2. **Strengthen regulatory tools to prevent contamination and intervene when risks materialize.** These reforms should include:

    a. Empowering USDA's FSIS to treat salmonella as an adulterant, and as a result, allowing FSIS to restrict or recall contaminated products from persistently noncompliant facilities.

b. Moving to a comprehensive risk-based framework—like that of the European Union (where human cases of salmonella declined by nearly one-half over five years from 2003 to 2009)[76]—that takes into account not simply the presence or absence of salmonella but also its virulence and antibiotic resistance profiles, so that regulatory attention aligns with risk to the public.

c. Implementing escalating enforcement for facilities with repeated contamination and resistance problems, including intensified inspection, mandatory corrective actions, and meaningful penalties for continued noncompliance.

d. Increasing resources for enhanced surveillance of antibiotic resistance by expanding laboratory capacity, staffing, and testing infrastructure so that federal agencies can conduct more comprehensive antibiotic susceptibility testing, identify emerging multidrug-resistant strains more rapidly, and respond before resistant pathogens become widespread.

e. Requiring USDA and FDA to set the enforceable reduction goals called for by the WHO,[77] and requiring tracking of on-farm use and comprehensive transparency in antibiotic application practices.

Without these reforms, high-virulence and multidrug-resistant salmonella will continue to circulate through the poultry industry, increasing the risk of severe illness and further undermining the effectiveness of antibiotics essential to human medicine.

76 "Salmonella," European Food Safety Authority, February 11, 2026.

77 "WHO Guidelines on Use of Medically Important Antimicrobials in Food-producing Animals," WHO, November 7, 2017.

APPENDIX

Antibiotics Included in USDA FSIS Serotype Testing with WHO Classifications of Medical Importance

USDA's Food Safety and Inspection Service (FSIS) tests salmonella serotypes found in poultry plants for resistance to these 17 antibiotics important to human medicine.

World Health Organization (WHO) Rankings: HPCIA = Highest Priority Critically Important Antimicrobials, CIA = Critically Important Antimicrobials, HIA = Highly Important Antimicrobials (see footnote 48 for definitions of these classifications).

ANTIBIOTIC	WHO CLASSIFICATION OF MEDICAL IMPORTANCE
ampicillin	Highly Important
amoxicillin	Highly Important
ceftriaxone	Highest Priority Critically Important
azithromycin	Critically Important
chloramphenicol	Highly Important
ciprofloxacin	Highest Priority Critically Important
colistin	Highest Priority Critically Important
trimethoprim sulfamethoxazole	Highly Important
cefoxitin	Highly Important
gentamicin	Critically Important
kanamycin	Critically Important
meropenem	Highest Priority Critically Important
nalidixic acid	Highest Priority Critically Important
sulfisoxazole	Highly Important
streptomycin	Critically Important
tetracycline	Highly Important
ceftiofur	Highest Priority Critically Important

Source: "WHO List of Medically Important Antimicrobials," WHO, 2024.

AUTHOR & ACKNOWLEDGMENTS

Farm Forward was founded in 2007 as the nation's first nonprofit devoted exclusively to end factory farming. We are a team of strategists, campaigners, and thought leaders guiding the movement to change the way our world eats and farms. More information about Farm Forward's work and our other publications can be found at farmforward.com.

This issue brief was written by:

Dr. Kathryn Gillespie

Farm Forward's VP of Research and Strategy, Dr. Gillespie received her PhD from the University of Washington in Human Geography and is the author of two books, including The Cow with Ear Tag #1389.

Dr. Gillespie thanks Farm Forward staff Andrew deCoriolis and John Millspaugh and consultant Dr. Lucy Gillespie for their essential contributions to this brief.