



## Broiler Chicken Operations by County

Two EnviroAtlas national maps display the number of farm operations that sell broiler chickens and the number of animals (heads) they manage by county, based on the 2017 U.S. Department of Agriculture (USDA) [Census of Agriculture](#). Operations are further categorized as small, medium, or large, based on the number of animals sold.

### Why are livestock and poultry farms important?

Livestock and poultry production is an important part of the agricultural economy of the United States, providing meat, eggs, milk, fur, wool, and leather. However, this production has the potential to negatively impact [public health](#), contributing to problems in water and air quality, greenhouse gas emissions, infectious disease outbreaks, and the spread of antibiotic resistance in pathogens. Therefore, tracking the distribution of livestock and poultry farms is pertinent to the U.S. economy and the health of its people.

Livestock and poultry farm operations play an important role in the agricultural economy. In 2020, livestock and poultry production accounted for 45% of all agricultural sales, totaling \$165 billion. Products from broiler chickens made up 13% of livestock and poultry sales.<sup>1</sup> The remaining 55% of sales covered crop production. Farmers typically feed crops to their livestock and poultry, making animals important consumers of agricultural products. Nearly two-thirds of the calories from crops grown in the U.S. feed livestock and poultry each year.<sup>2</sup> As such, livestock and poultry operations have an outsized impact on the overall agricultural economy.

The U.S. Department of Agriculture reports that 9.2 billion broiler chickens were commercially harvested in 2019. Most commercially-raised poultry are kept indoors in large groups in confined animal feeding operations ([CAFOs](#)). The chickens generate waste that if not managed properly may pollute the environment and risk public health. Rainfall, especially flooding events, can wash manure from farms into surface waters, leading to elevated levels of nitrogen, phosphorus, and potassium in aquatic ecosystems and drinking water sources.<sup>3</sup> Some pathogens in animal waste, such as giardia, salmonella, cryptosporidium, and various strains of *Escherichia coli* (*E. coli*), can spread to humans from animals in drinking water. This [nonpoint source pollution](#) may contribute to the [eutrophication](#) of waterways and the growth of harmful algal blooms.



Photo: Broiler chickens, Stephen Ausmus, USDA ARS

Farm operators often administer antibiotics to livestock and poultry to increase growth and prevent disease, particularly in confined animal feeding operations. Chickens are routinely fed antibiotics. Antibiotics and antibiotic-resistant bacteria found in waste may contaminate surface waters,<sup>4</sup> risking public health either directly through exposure to antibiotic-resistant pathogens or indirectly by shaping the soil microbial community.<sup>5</sup> In 2020, an estimated 6 million kilograms of antimicrobial medication were sold to farmers in the United States, 2% of which were intended for chickens.<sup>6</sup> Animal waste may impact air quality as well. In 2020, respiratory issues attributable to livestock rearing accounted for an estimated 8,400 deaths in the United States, primarily related to elevated levels of ammonia, hydrogen sulfide, and [volatile organic compounds](#).<sup>7</sup> In addition to gases that risk respiratory health, livestock and poultry production emit greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, representing nearly 9% of the United States' [greenhouse gas](#) emissions each year.<sup>8</sup>

### How can I use this information?

These two EnviroAtlas maps, Broiler Chicken Operations by County and Number of Broiler Chickens Managed by County, represent one of eleven categories of national maps taken from the 2017 USDA Census of Agriculture. Together, the maps illustrate the county-level distribution of farm operations in the United States. These data have multiple applications, such as assessing trends in size and distribution of livestock and poultry operations, examining the effects of this production on public health, or understanding policies intended to regulate the agricultural industry.

An area on the EnviroAtlas interactive map can be more thoroughly investigated for conservation, water quality, or restoration by increasing the transparency of the map layer over an aerial imagery base map and adding data for streams and water bodies (NHDPlus, found under Hydrologic Features). Detailed examination using an aerial imagery base map shows the topography and landcover within the county or area of interest, the proximity of visible pastureland or CAFOs to slopes and waterbodies, and whether waterbodies are buffered by riparian (streamside) vegetation.

### How were the data for this map created?

These data layers are based on the [Census of Agriculture](#), which is administered every five years by the USDA. For livestock and poultry production, the census reports the number of operations that manage or sell various animal commodities as well as the number of animals managed or sold by county. Only data regarding broiler chickens are displayed in this layer. In addition to the total number of operations, the Census of Agriculture reports the number of operations managing various count intervals of animals (e.g., 1–1999, 2000–59,999 animals). The layer combines data from these count intervals into size categories: small (1-59,999 animals), medium (60,000-199,999 animals), and large (200,000 or more animals). These maps display the number of farm operations that manage broiler chickens and the number of animals sold throughout 2017. Numbers of small, medium, and large operations and additional census years (2002, 2007, and 2012) are available for [download](#).

### Selected Publications

1. US Department of Agriculture, Economic Research Service. 2021. [Farm income and wealth statistics](#). Accessed January 2023.
2. Cassidy, E.S., P.C. West, J.S. Gerber, and J.A. Foley. 2013. [Redefining agricultural yields: from tonnes to people nourished per hectare](#). *Environ. Research Letters*. 8: 034015.
3. Motew, M., E.G. Booth, S.R. Carpenter, X. Chen, and C.J. Kucharik. 2018. [The synergistic effect of manure supply and extreme precipitation on surface water quality](#). *Environmental Research Letters* 13: 044016.
4. Youngquist, C.P., S.M. Mitchell, and C.G. Cogger. 2016. [Fate of antibiotics and antibiotic Resistance during digestion and composting: A review](#). *Journal of Environmental Quality*. 45: 537–545.
5. Yang, Y., A.J. Ashworth, C. Willett, K. Cook, A. Upadhyay, P.R. Owens, S.C. Ricke, J.M. DeBruyn, and P.A. Moore, Jr. [Review of antibiotic resistance, ecology, dissemination, and mitigation in U.S. broiler poultry systems](#). *Frontiers in Microbiology*. 10: 2639.
6. US Food and Drug Administration, Center for Veterinary Medicine. 2020. [2020 summary report on antimicrobials sold or distributed for use in food-producing animals](#). Accessed January 2023.
7. Thakrar, S.K., S. Balasubramanian, P.J. Adams, I.M.L. Azevedo, N.Z. Muller, S.N. Pandis, S. Polasky, C.A. Pope, A.L. Robinson, J.S. Apte, C.W. Tessum, J.D. Marshall, and J.D. Hill. 2020. [Reducing mortality from air pollution in the United States by targeting specific emission sources](#). *Environmental Science Technology Letters* 7 639–645.
8. US Environmental Protection Agency. 2021. [Inventory of U.S. greenhouse gas emissions and sinks: 1990–2019](#). Accessed January 2023.

### What are the limitations of these data?

EnviroAtlas uses the best data available, but there are still limitations associated with these data. These data layers are based on the USDA Census of Agriculture. Ideally, the coverage and response to the census would be complete; however, this is unrealistic. Statistical models account for nonresponse, under-coverage, and misclassification. Therefore, data provided by the census are estimates. Additionally, the census withholds the number of animals produced in a county if that data could identify individual operations. Data withheld by the census are represented in this layer by a null value. A value of zero reflects a true absence.

### How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. The census can be accessed through the [Quick Stats](#) interface.

### Where can I get more information?

To learn more about the USDA [Census of Agriculture](#), see the [guide](#) for reporting, [methodology](#) for conducting the census, and [FAQs](#). For additional information on data creation, access the [metadata](#) for the data layer. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

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