



## Laying Hen Operations by County

Two EnviroAtlas national maps display the number of farm operations with laying hens 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, depending on the number of animals managed.

### 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. Chicken eggs made up 5% of the livestock and poultry sales. The remaining 55% of sales covered crop production.<sup>1</sup> 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 production has an outsized impact on the overall agricultural economy.

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> This [nonpoint source pollution](#) may contribute to the [eutrophication](#) of waterways and the growth of harmful algal blooms.

Farm operations 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



Photo: Laying hens, P. Keres, USDA

found in waste may also 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, Laying Hen Operations by County and number of Laying Hens 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 heads managed or sold by county. These maps display the number of farm operations that manage laying hens and the number of animals on the property at the end of 2017. Only data regarding laying hens are displayed in these layers. 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., 1–49, 50–99 animals). The layer combines data from these count intervals into size categories: small (1-399 animals), medium (400-19,999 animals), and large (20,000 or more animals). Numbers of small, medium, and large operations and additional census years (2002, 2007, and 2012) are available for [download](#).

### 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 heads produced in a county if that data could be used to 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](#).

### Acknowledgments

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### Selected Publications

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