

Understanding RFID Technology and How It Could Benefit the Poultry Industry

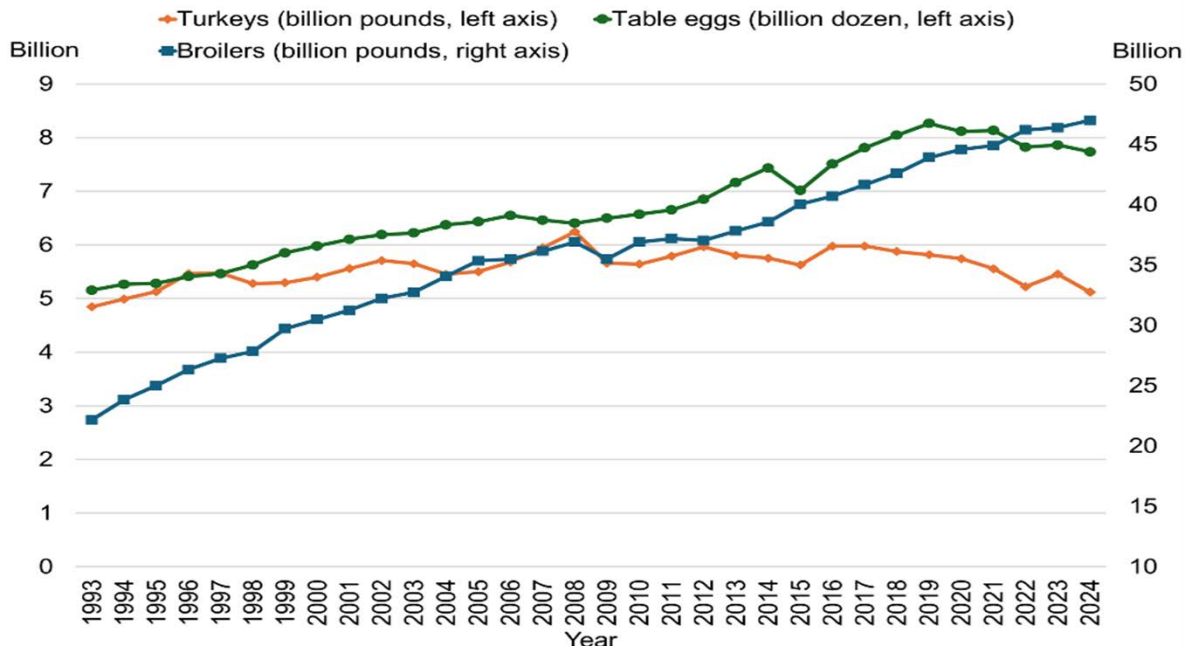
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Introduction

The poultry industry is no stranger to new and recurring threats that challenge operational processes, including biosecurity procedures and production demands. Currently, the market for poultry products is witnessing an ever-increasing demand that continues to grow each year (Fig. 1). This growth in both domestic and international demand has placed mounting pressure on the poultry industry to produce enough to meet these demands. For context, egg production value in 2024 alone increased by 17.7 percent from 2023, reaching an impressive \$21.0 billion, while in 2023 sales were \$67.4 billion. That number shot up to \$70.2 billion in 2024 (USDA, 2025a). Thus, the stakes are high when it comes to supplying poultry products on a global scale, with demand showing no signs of slowing down or access to these products becoming easier. Additionally, startup costs in the commercial egg industry range from \$25,000 to well over \$150,000 (Startup Financial, 2025). Other challenges, such as disease, pose a persistent threat to the ability to supply these markets and cause significant economic losses, as we have seen with the current highly pathogenic avian influenza cases alone: as of December 2, 2025, 883 commercial flocks have been infected since February 8, 2022 (USDA, 2025b). Amid these ongoing challenges, research and development of strategies to combat disease threats are creating new opportunities for promising emerging technologies. If successful, emerging technologies, such as RFID, could lead to improved biosecurity, earlier disease detection and aid workers in everyday tasks.

Annual U.S. production of broilers, turkeys, and table eggs, 1993–2024



Source: USDA, Economic Research Service calculations using USDA, National Agricultural Statistics Service data.

Figure 1: Annual production of broilers, turkeys, and table eggs, 1993-2024.

The Current Problems

Labor shortages are an ongoing challenge and persist across all segments of the poultry industry. Notably, the physical toll on the body, the loss of employees to competitors and the retirement of the workforce without replacements (Farrelly Mitchell, 2025) contribute to high turnover, which puts increasing pressure on commercial facilities. Unfortunately, the poultry industry, like many other agricultural sectors, is facing numerous unknown variables amid the uncertainty of our complex political climate. These unknowns can cause the projected forecasts of sales, labor needed, and future project plans to shift in an instant. When considering the economic, political and labor challenges in the livestock industry, new technologies must be evaluated before being implemented to reduce stress in an already stressed established system. Research and data collection will provide us with an opportunity to demonstrate how the implementation of these technologies enhances work conditions, addresses labor shortages, and ultimately improves overall flock health.

What Is RFID and How Does it Work?

In the cattle industry, the use of radio frequency identification (RFID) is gaining farmers' attention for its potential to improve herd monitoring and management. Radio frequency identification is a method for transferring data and providing personalized information about animals or objects without physical contact; it is wirelessly transmitted. The cattle industry uses RFID in ear tags to track cattle in real time (Qaltivate, 2025), but RFID technology currently has limited use in poultry. The use of RFID tags in the livestock industry is expected to grow exponentially due to the simplicity of RFID systems, the increasing use of data analytics in livestock, and the ability to collect real-time data to inform management decisions (Qaltivate, 2025). There are only four components required when using the RFID system: the transponder, the transceiver, the data accumulator and the processing software.

To understand the RFID components and how they interact, first, the transponder is something you have likely seen in real time on cattle—the ear tag. Inside the tag is a microchip with a specific ID number for that individual animal. The transceiver can then retrieve data stored in the transponder by emitting a radio signal via the antenna. Transceivers can be set up on virtually any surface or used as a handheld device. Next, the data accumulator can be embedded in the handheld device with the transceiver, or it can be wired to the transceiver you set up. Data is then sent and stored in a program for you to access conveniently and easily (Grooms, 2007). The data can be gathered hands-off since each time the animals interact with the reader, their tag can be scanned. This data collection also can be broken down into categories, such as vaccinations received, animal age and more. Another benefit of this system is that the data can be viewed offline and provide visual tracking and analysis. Of course, there are a couple of factors to consider when looking at RFID. For instance, the size of your operation, the storage capacity, battery life and displays (Cykeo, 2025). RFID technology has been widely used in other industries such as cattle, sheep, swine and goat operations. This technology can also benefit poultry operations by helping manage flocks more effectively and improving welfare.

The Benefits of Integrating Other Livestock Technology into Poultry

The biosecurity advantage of RFID cannot be overstated, especially given the ongoing threat posed by devastating diseases such as highly pathogenic avian influenza (HPAI). Bird flu can spread rapidly through a flock once introduced through various means, such as direct or indirect contact with other birds, feces, equipment, and people (USDA, 2019). Due to the high mortality rate of HPAI and its rapid spread, once detected in a flock, depopulation is the next step. The economic impact of this disease extends beyond the loss of egg sales at the grocery store, as producers also incur costs for time and labor. Once the virus is detected and depopulation has occurred, everything must be cleaned, disinfected and left untouched until the barns test negative for HPIA (Innovate Animal Ag, 2025). Once cleared, producers now must start over with new pullets, and it typically takes about five months for those chickens to reach maturity and begin laying eggs (FAO, 2023). The most effective strategy against these devastating diseases, such as avian influenza, is to have a robust biosecurity plan in place. That is where RFID can become an excellent tool for producers in the fight against disease. As mentioned above, viruses can enter a poultry house using a variety of methods, one in particular is through people. Unfortunately, viruses can be carried in through shoes, hands and clothing (USDA, 2019). To limit this potential exposure, using RFID systems could reduce the time workers spend in the poultry houses and the frequency of their entries. Also, because RFID can track animals' movements, feeding and drinking, it can be a crucial alert for disease detection in our flocks and help quickly locate chickens to either isolate or dispose of animals that have died.

Other critical aspects that RFID can address are management, welfare and labor input. A study published in PubMed Central examined the development of individual tracking in flocks using RFID. The study found sufficient performance in using RFID tracking to gather data about individual poultry behavior when the chickens visited nesting boxes, perches and winter gardens (Alindekon et al., 2025). Although, the study reported that tracking for drinkers and feeders remained a challenge due to rapid movements, which reduced dwell time, signal interference caused by overcrowding, and an increase in misreads in open areas resulting from surrounding movement (Alindekon et al., 2025). However, given how quickly technology is advancing, these issues do not seem to be lasting. Instead, when considering what RFID can do for the poultry industry, the possibilities seem endless. For example, currently, research is underway to determine whether RFID can accurately detect whether a hen laid an egg in the nesting box (Swedberg, 2024). This research would have a significant impact on the operation's bottom line. Having accurate records allows us to see which hens are laying and which have stopped laying. Ultimately, this allows producers to reduce feed costs by culling the nonproductive hens from the flock.

Conclusion

Considering how costly the commercial egg industry is even to start, ranging from \$25,000 to well over \$150,000, and with thousands of birds and multiple houses to oversee, adopting an RFID system can be an advantageous tool for producers, enabling them to track, organize and record data with greater accuracy, including animal health, vaccination history, movement and diseases. While using RFID in poultry remains a new concept, given the benefits observed thus far, RFID technology will continue to be researched, become less expensive and advance in data-collection methods, much as it has in other livestock industries. With so many factors affecting the industry at once, no one can really predict what will happen next or when. However, by being aware of the factors we can control, especially in management, disease and labor, the industry can make informed decisions based on data specific to its operations.

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