

The Business and Biosecurity of Bird Flu: Integrating Tabletop Workshops and Interactive Activities for Middle and High School Students

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Introduction

Biosecurity is defined as “security from exposure to harmful biological agents and includes measures taken to ensure this security” (Merriam-Webster, 2014, para. 1). Biosecurity is implemented in everyday life through hand washing and household preventative measures to manage harmful viruses and bacteria. Many children are taught these principles early, but how easy germs can transmit is not always illustrated. The poultry industry relies heavily on biosecurity because of how prone chickens are to disease. Highly pathogenic avian influenza (HPAI) affects more than 166 million birds and range of species, including chickens, turkeys, ducks, pheasants, and geese (Animal and Plant Health Inspection Service, 2026). In the U.S., chicken has become a household staple as “the availability of chicken began its upward climb in the 1940s, overtaking pork availability in 1996 and surpassing beef in 2010 to become the meat most available for U.S. consumption” (Economic Research Service, 2025, para. 3). With increased accessibility of chicken products came a demand higher than ever before; however, the demand cannot be reached without the continuous efforts of producers and animal health officials because of how susceptible poultry is to illness (Blazejczyk & Kantor, 2025). Guided by Kolb’s (1984) model for experiential learning, the purpose of this innovative idea was to introduce youth (aged 9–13) to principles of biosecurity to raise awareness of the importance of mitigating and managing a potential infectious disease outbreak in the poultry industry.

How it Works

Funded by the United States Department of Agriculture (USDA), the New Mexico Department of Agriculture, along with Colorado and Wyoming, designed the Western Small Flocks Collaborative to provide materials and course content to improve disease prevention and preparedness for small-flock poultry owners. To introduce youth to key concepts from this initiative, we implemented our workshop at the annual State 4-H Youth Getaway for ages 9–13. We conducted eight presentations lasting approximately 45 minutes with approximately 20 students in each group ($N = 160$). The following objectives guided the presentation: (1) define biosecurity; (2) identify common biosecurity practices; and (3) identify the risk and potential impact of an infectious disease outbreak in the poultry industry.

We started the presentation by asking if anyone had chickens at home or at a family or friend’s house and who enjoyed eating chicken to illustrate how many people might interact with the poultry industry on a frequent basis. We then provided a brief introduction to biosecurity and common biosecurity practices. Next, we placed students into three groups where we randomly assigned students with the role of the “farmer” or “poultry operator” in three hypothetical scenarios. The scenarios represented one farm that modeled exemplary biosecurity practices, a second farm that showcased decent farm measures but had room to improve, and the third showcased an operation that practiced little to no safe biosecurity measures. Each farm received unique background information on the size of flocks, facilities, and marketing for each hypothetical operation.

We then shared a hypothetical case study via a PPT presentation. The scenario spanned eight days and included details about a disease outbreak impacting three neighboring farms including different elements of interaction between people, animals, and equipment on the farms. As the scenario unfolded, various livestock animals, poultry, and people became ill, and eventually some animals died, a child was hospitalized, and the farms experienced quarantine, veterinary investigations, and visits from public health officials. We encouraged students to take notes and refer to their property maps to enhance engagement. After the scenario, the groups discussed, “What do you think happened at your property, and could the events have been prevented?” We then hosted a hands-on activity to illustrate a “mucous swap” using cups with powdered milk and Nido formula. Students swabbed several cups with liquids that appeared the same. We then added iodine to illustrate that the milk cups mixed with Nido formula turned purple. Students worked together to determine the source swab and model traceability.

Results to Date

When listening to the case study instruction and the daily happenings, the students took notes attentively as instructed and were highly engaged in the conversations to determine what happened. Most every student greatly enjoyed the swab activity. They shared insightful perspectives on how the different biosecurity levels at each farm impacted the results of the scenario. Students easily engaged with their peers, which encouraged an increased level of critical thinking. There was rarely an unengaged moment. The hands-on activity was also beneficial because every student realized how fast germs can spread. They recognized the difficulty of traceability procedures, even with isolated flock management, which further focused their perspective and increased awareness of enforcing safe biosecurity practices in the poultry industry and at home. Students successfully connected principles from the scenario into the discussion. We received positive feedback from students and club leaders by stating that the workshop was highly beneficial equipped with practical information about biosecurity.

Advice to Others

If feasible, we recommend piloting the presentation because the timing of the events played a significant role in the success of the presentation. It may also be helpful to have small cups of milk and formula prepared before each session as 45-minute rotations did not allow much time to reset between groups. Because the presentation focused on biosecurity awareness, we also recommend having some handwashing stations or hand sanitizer nearby following the event. Finally, we encourage focusing on a strong conclusion to emphasize the importance of biosecurity to safeguard business continuity and promote a safe, sustainable food supply.

Costs and Resources

During the presentation, we used a mobile Epson projector and pop-up screen (~\$500). We also used paper and pens for notes (enough for every student), and a summary of each farm operation (~\$10). The total cost of the resources for the activity was \$100, which included powdered milk, Nido toddler milk beverage, liquid iodine, water, and a cup for every student ($n = 160$). The scenario did not necessarily need a portable screen; however, it was helpful to display information outside of a standard classroom setup.

References

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