

# Understanding and Preventing Bird Damage

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Compiled by: You-Ting Liu

Department of Dairy Section, Kuang Chuan Dairy Co., Ltd., Taiwan

## 1. Introduction

Wild birds cause significant losses to dairy farms by consuming and spoiling feed. A study conducted in Washington state, USA, revealed that wild birds cause approximately \$14 million in damages annually to the dairy industry. The report also noted that over 10,000 birds may be active on dairy farms daily, potentially introducing pathogens such as *Salmonella* and *Mycobacterium avium* subsp. *paratuberculosis* (the latter can cause tuberculosis in cattle).



Over a three-year period, this study evaluated the bacteria in bird droppings and their impact on the nutritional value of cattle feed. Five farms participated in the study, collecting bird droppings and cattle feed samples. The analysis showed



that bacterial populations in bird droppings did not significantly vary between farms, but *Campylobacter jejuni*, a bacterium known to cause bovine abortion, was found on one farm.

Due to the design and configuration of farms, feed loss differed across the farms. Understanding bird preferences can improve bird deterrence management techniques. Sustainable methods, such as attracting birds of prey to the farm, may benefit both cattle welfare and the economic sustainability of the dairy operation.

European starlings (*Sturnus vulgaris*) cause millions of dollars in damage to U.S. agriculture (Linz et al., 2007). On dairy farms, starlings and other pest birds consume cattle feed, causing feed losses

and transmitting pathogens to cattle. Pest birds carry a variety of pathogens, including *Salmonella*, *E. coli*, and *Campylobacter* (Hancock et al., 1998; Pedersen et al., 2006). The prevalence of *Salmonella* in birds ranges from 0.07% to 12% (Faddoul et al., 1966; Gaukler et al., 2009), and bird activity consumes 2.8% to 4.9% of dairy feed (Shwiff et al., 2012). In Taiwan, tests have shown that birds consume approximately 1.7%-3.2% of feed per day.

Although information on how birds affect the nutrient concentration of feed is limited, some studies have shown that birds can reduce starch content in feed by 24.2% to 83%, with ash content showing the least reduction (Allen et al., 2012).

## **2. Economic Survey**

European starlings and pigeons are the most common pest birds on dairy farms (in Taiwan: sparrows, pigeons, and mynas). Farmers estimate that between 1,000 and 10,000 pest birds are present on their farms daily. Most farmers opt for shooting as their primary bird control method, and the larger the bird population, the greater the risk of *Salmonella* and tuberculosis infections. The average feed loss due to bird consumption is estimated at 4.4%. Based

on the average number of cattle and feed prices in Washington state, bird damage costs the dairy industry approximately \$14 million annually.

## **3. Bacteria in Bird Dropping**

Pest bird densities on farms range from 1 to 4 birds per square meter, with the highest numbers found along walkways. Bird droppings contain *E. coli* (39%), *Salmonella* (0%), and *Campylobacter* (1.1%).

## **4. Nutritional Loss in Feed**

Farm owners invest time and money to ensure their cattle receive the proper nutrition for body maintenance, milk production, and overall health. One way to achieve this is through Total Mixed Ration (TMR) feeding, which ensures that each bite of feed contains balanced nutrition. However, birds selectively consume specific components of the TMR, leading to nutritional imbalances.

In just 30 minutes, 31% of the net energy for lactation in TMR can be lost due to bird consumption. Two farms (A & B) with similar bird populations were observed, and it was found that the birds preferred to feed when fresh feed was delivered while the cows were being

milked, as this allowed them to consume feed undisturbed.

The above points illustrate the harm birds can cause to farms. As farm owners, how can you prevent and mitigate bird damage? The following 10 points may serve as a reference:

- 4.1 **Seasonality:** Pest birds on farms are usually seasonal. Birds tend to roost on dairy farms during colder months and move outdoors when the temperature rises. Regardless of your barn system, birds will consume and spoil feed.
- 4.2 **Bird Species:** European starlings, pigeons, sparrows, mynas, and crows are common pest birds on farms. Understanding which species are most prominent on your farm is important for selecting the appropriate deterrence methods.
- 4.3 **Feed Loss:** A 2019 study estimated that bird-related feed loss costs about \$55 per cow per year. Do you know the total cost of feed loss due to birds on your farm?
- 4.4 **Disease Transmission:** Pest birds carry various bacteria and viruses in their droppings and on their feet. Birds moving between farms increase the spread of pathogens,

which scientists believe is a major cause of cattle health issues. Finding ways to reduce cattle exposure to wild birds, including their droppings, is critical to cattle health.

- 4.5 **Implement Deterrence:** When bird populations on your farm are low, that's the time to implement bird deterrence methods. For most open dairy farms, the ideal time for deterrence is summer when birds are not roosting on the farm. Once birds establish nests, removing them becomes more difficult.
- 4.6 **Investing in Bird Deterrence:** How much should you invest in bird deterrence equipment on your farm? If you're unsure about the extent of feed loss, a 4.4% (or 3% in Taiwan) loss rate is a good starting point. More difficult to calculate is the potential loss due to bird-induced cattle illness or death. Once you have a proper estimate of bird damage, you'll be more confident in selecting deterrence methods.
- 4.7 **Lethal Methods:** Lethal deterrence methods may seem appealing, but consider the potential consequences. Shooting birds is a common deterrence method, but most farmers report it is only "partially effective." Using poison to deter birds is another

option, but you risk unintentionally harming beneficial birds or other non-target animals.

#### 4.8 Unpredictability of Deterrence

**Methods:** Contrary to popular belief, birds are quite intelligent. Any bird deterrence method you use needs to be unpredictable; otherwise, the birds will get used to it and it will lose effectiveness. A good example comes from a vineyard where a professional falconer was hired to prevent pest birds from entering the vineyard. Everything went well until the birds began associating the falconer's truck with the presence of birds of prey. As soon as the truck appeared, the birds would fly away and return once the truck left.

4.9 **Lasers:** Can lasers prevent birds from nesting on farms? Lasers can be an effective way to deter birds, but they must overcome issues such as brightness, especially during the daytime. If you're considering lasers for bird control, this is something to keep in mind.

4.10 **Native Birds of Prey:** Some native birds of prey populations are declining, while invasive species (like European starlings) are increasing. Creating nesting boxes and perches for local birds of prey on

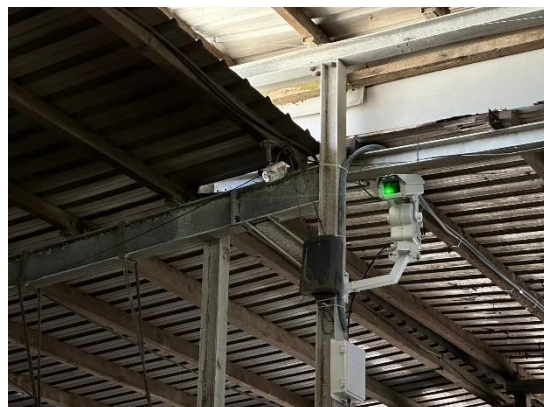
your farm may attract them and help deter pest birds.

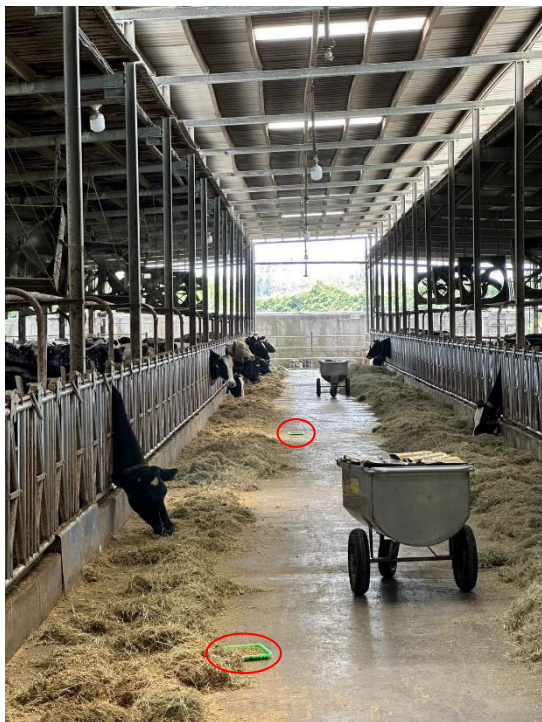
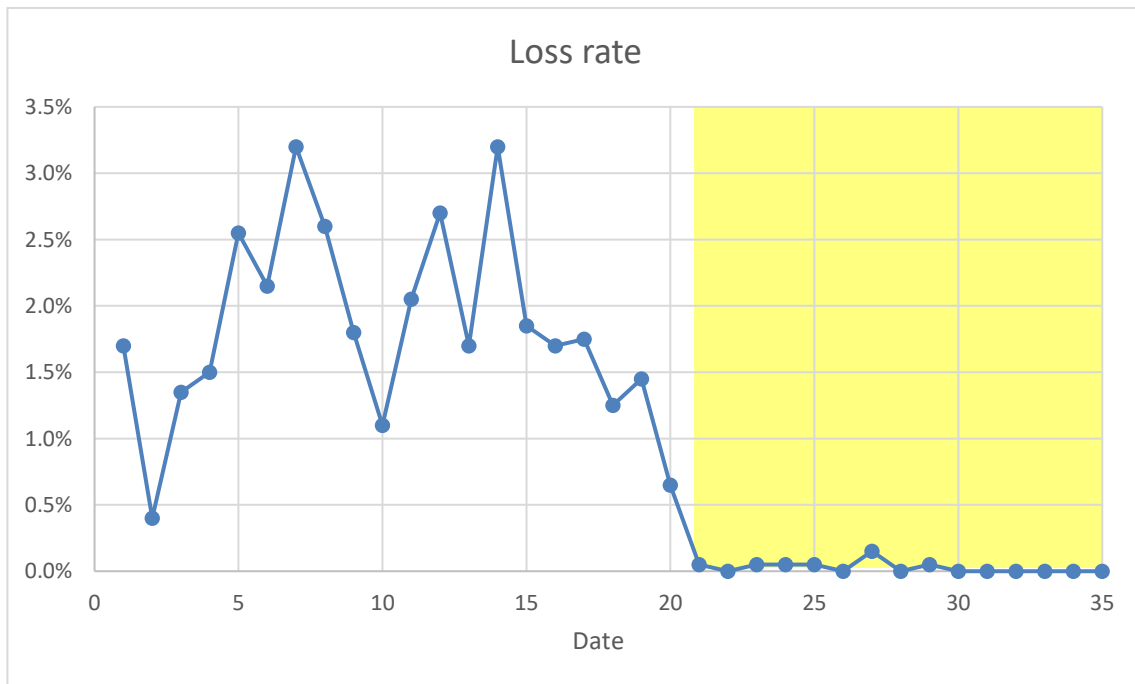
## 5. Results and discussion

Finally, we have collaborated with Taiwanese company iCHASE to test AI-based laser bird repeller on farms. Over a one-month period, we observed that before using lasers, feed losses on the farm ranged from 1.5% to 3.2%. However, further observation revealed that some birds still managed to consume the TMR feed.

## 6. Test method

Along a walkway of about 50 meters, bait trays were placed every 10-15 meters. A total of 2 kilograms of feed was randomly distributed across 4 bait trays after the daily tasks were completed. The trays were then collected after the evening tasks, with the results shown in the diagram below.





## 7. Reference

[1] Adams Progar, Amber & Steensma, Karen & Elser, Julie & Kerr, Susan & Caskin, Tyler. (2020). Understanding and Preventing Bird Damage on Dairies.

[2]

<https://www.agproud.com/articles/59493-top-10-tips-for-managing-pest-birds-on-dairy-farms>; Top 10 tips for managing pest birds on dairy farms |