

Pest Bird Management

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Pest Bird Management: How to Stop the Flock

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Introduction

Pest birds cause a significant amount of damage on dairies across the United States every year. These losses range from crop damage to the loss of cattle feed from bird depredation. The economic losses from bird depredation of feed has been self-reported by dairy farmers from coast to coast in the United States. A survey of dairy farmers in New York, Pennsylvania, and Wisconsin suggests dairies reporting 10,000 or more birds per day lost \$64,000 of feed annually (Shwiff et al., 2012). An additional survey of dairy farmers in Washington State reported feed losses that equated to \$55 per cow per year (Elser et al., 2019). Besides the loss of feed, pest birds also pose a health risk to cattle.

Most pest bird species are carriers of potentially pathogenic bacteria including *Salmonella spp.*, *Escherichia coli spp.*, *Campylobacter spp.*, and *Mycobacterium avium paratuberculosis*. They can transfer bacteria from farm to farm on their feet or through their fecal matter. A probable connection between the presence of pest birds and cattle health was identified in both of the previously mentioned surveys. Results from the surveys indicated that farmers in Washington State, New York, Pennsylvania, and Wisconsin whom reported more than 10,000 pest birds per day on their dairy were more likely to have Johne's disease or *Salmonella* present on the farm (Elser et al., 2019; Shwiff et al., 2012). Pest birds may contribute to disease transmission on dairies. The methods available for pest bird deterrence vastly range in price and effectiveness. Shooting is the most commonly used deterrence method, but farmers self-reported it as only "somewhat effective". The use of netting over entry points in the barn can be effective but expensive. Cannons or predator calls are effective at first, but then pest birds habituate to them. Although pest birds pose a threat to farm viability, research on this issue is limited.

Over the past seven years, our research team investigated pest bird movement on dairies, feed nutrient loss from bird depredation, bacteria present in bird fecal matter, effects of pest bird presence on dairy cattle behavior, and the effectiveness of lasers and native raptors as bird deterrence methods.

Pest Bird Movement

Wild birds have little need to inhabit dairy barns during the warmer months of the year because nature provides their housing and nutritional needs. However, shelter and food become scarce during the winter months. Dairy barns provide a suitable environment for birds during winter, especially with a plentiful food supply. This is one reason why wild birds begin establishing a night roost in dairy barns at the end of the fall season. Our team monitored bird night roosting behavior and bird count data on 12 Washington State and Idaho dairies during the fall and winter months. Across all farms, European starlings (*Sturnus vulgaris*) were the most commonly recorded bird species, with a few sparrows and pigeons also observed. As environmental temperatures decreased, the number of birds present on the dairies increased (Lichtenwalter et al., under review). This study documented the movement pattern we expected for pest birds on dairies.

Feed Quality

Feed loss from pest bird depredation and spoilage is the most common type of pest bird damage reported by dairy farmers. Besides the loss of feed quantity, pest birds also influence feed quality. In theory, the total mixed ration (TMR) is formulated so that the cow receives balanced nutrients in every bite. We determined how pest bird depredation of the feed affected feed quality for 19 lactating cow pens on five dairies. Fresh feed samples were collected upon delivery to the feed bunks. We then allowed the pest birds (primarily European starlings) to consume feed for 30 minutes while the cows were being milked. Feed samples were collected from the areas of the feed bunk that were most densely populated by pest birds. Changes in feed quality differed by farm, depending on the lactating cow diets. For example, farms that fed corn silage noticed a significant decrease in net energy for lactation, but farms that fed haylage did not notice a drop in net energy for lactation (Caskin et al., under review).

Bacteria Transmission

Understanding the prevalence rate of pathogenic bacteria in pest bird fecal samples found on dairies allows us to analyze potential relationships between pest bird presence and cow health. We collected 88 fresh fecal droppings from European starlings on five dairies. All samples were evaluated for *Salmonella spp.*, *Escherichia coli spp.*, and *Campylobacter spp.* Over 38% of samples contained *Escherichia coli spp.* and 1% contained *Campylobacter jejuni*. *Salmonella* was not detected in our samples (Caskin et al., under review). These results differ from similar studies in other regions of the United States. It is apparent that regional differences in bacteria prevalence in bird fecal matter exists, and direct connections between pest birds and cattle health cannot be easily established.

Cow Behavior

Several studies investigated pest bird damage to feed and potential disease transmission, but no known studies determined whether pest bird presence influences cow behavior. We conducted two studies that observed cow behavior at the feed bunk when pest birds were present. The first study included 16 pens from five dairies. Cow behavior was recorded one hour prior to feed delivery and three hours post-feed delivery. Bovine-bovine interactions as well as bovine-avian interactions were observed. As the proportion of occupied headgates at the feed bunk increased,

the number of occurrences of bovine-avian aggression increased. Bird aversion towards cattle also increased as the proportion of occupied headgates at the feed bunk increased (Caskin et al., under review). Interestingly, pest birds preferred to occupy the ends of the feed bunk in lieu of the middle of the feed bunk in freestall barns. These locations may have been preferred because they were closer to the barn exits.

The second study recorded the number of pest birds that established a night roost within the freestall barns at one dairy during the winter. These bird estimates were analyzed against cow behavior data collected for 214 lactating cows during the bird observation periods. Cow inactivity or high activity were not affected by pest bird presence. However, changes in time spent ruminating, eating, and being active were related to pest bird presence (Lichtenwalter et al., under review). As the number of birds increased, the average number of minutes cows spent eating or ruminating per hour decreased. These results suggest that pest birds may negatively impact cow behavior, in addition to impacting cow feed quality, which could lead to potential metabolic health concerns.

Deterrence Methods

We have anecdotal evidence that having resident raptors present on a dairy is one of the most effective long-term pest bird deterrence methods. This method is also environmentally-friendly and socially-acceptable. Attraction techniques such as installing nestboxes or perches can encourage a raptor to visit a dairy, and hopefully choose that dairy as a nesting site. We installed 40 American kestrel nestboxes on seven dairies in Washington State and are monitoring nestbox occupancy over the next several years. Another deterrence method we are testing is the use of lasers in freestall barns. Our goal is to determine whether these lasers will deter birds from establishing night roosts in the rafters of the barns. By the end of our project, we intend to have valuable information on these two bird deterrence methods to help farmers decide which methods are the most economical and successful for their dairies.

To-do List

Based on the past seven years of data and observations, we have a list of recommendations that will help dairy farmers minimize pest bird damage. Here are the top four:

- ✓ Estimate the number of birds on your farm, especially during consistently cold weather
- ✓ Do not underestimate the amount of pest bird damage on your farm
- ✓ Implement deterrence methods during warmer weather, make your dairy less “comfy”
- ✓ Consider using more than one deterrence method

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