Preventing Disease Transmission in Livestock and Poultry
VECTORS: FLIES

Every operation has flies and while they are all considered a nuisance, certain types are responsible for causing or spreading disease.

Efforts to control flies can help protect your animals.

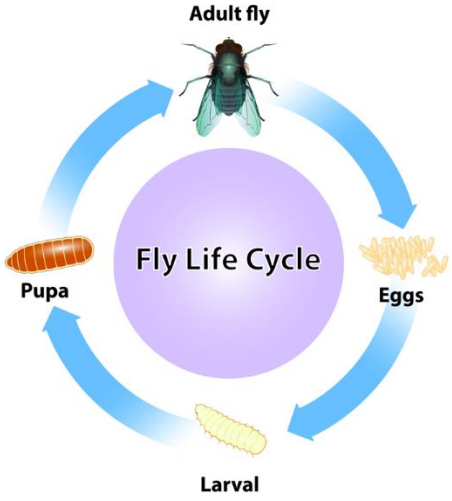
THE FLY LIFE CYCLE

Flies develop through 4 life stages: egg, larva (maggots), pupa, and adult. In warm weather, some flies can complete all stages within 2 weeks.

Flies need moist areas for their life stages. Adult flies lay their eggs in wet organic matter, such as manure or decaying material (e.g., dead animals). Bacteria and viruses that may cause disease are picked up from these sources.

Adults are the biggest concern. They spread disease through their mouths and on their bodies. Some flies are biting species and can transmit blood-borne pathogens in this manner.

Flies are potential vectors for diseases including vesicular stomatitis and salmonellosis.



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INTEGRATED PEST MANAGEMENT

An Integrated Pest Management (IPM) approach is best. IPM uses a combination of methods for pest control for the least possible hazard to people, property, and the environment. This involves monitoring, environmental control and treatment of animals as a multiple attack on flies.

Monitoring for Flies

Monitoring can be as sophisticated as counting fly specks on paper placed throughout a barn or as simple as observing animal housing areas and the environment for the presence of adult flies.

Areas to monitor include: animal housing areas, accumulated wet bedding in pens, manure around feeders, lagoons, feed storage areas (bins, troughs, bunkers, silos), wet areas in the environment and carcasses.

It is best to monitor these areas before fly season begins and every two weeks throughout fly season.

Fly Control on the Farm

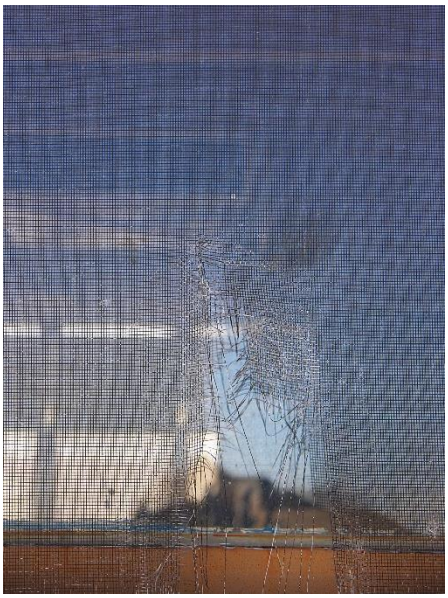
The elimination of flies on the farm is not likely. However, various prevention and control measures can reduce exposure of your animals and prevent disease spread.

Fly control measures should focus on three key areas: exclusion, source reduction, and control of adults.

Exclusion

One of the first goals is exclusion – or preventing contact between domestic animals and flies. Limiting livestock and poultry exposure to flies can reduce disease transmission risks.

- Keep animals indoors when possible to minimize exposure.
- Use screens on barn windows and keep them in good repair.



Source Reduction

Source reduction involves the elimination of potential egg laying areas. Moisture is also needed to prevent the eggs, larvae and pupae from drying out. Reducing moisture disrupts the egg, larval, and pupal stages.

- Disturb or break up manure and organic matter (wet soil/mud, bedding) weekly to prevent insect eggs from hatching.
  - This can be done by dragging dry lots, pastures, scraping and hauling manure to storage.
  - Stored manure can be an egg laying area for flies if it does not have a hard crust on top.
- Promote drying by circulating air, draining wet areas, and spreading manure in thin layers.
- Organic debris (e.g. spilled feed, bedding, rotten vegetation and leaf litter) should also be disturbed once a week to prevent fly eggs from hatching.
  - Cleaning up spilled feed, scraping around bunks and preventing accumulations of moist bedding will decrease the adult fly population.
- Fly parasites have been used with success on some farms.
  - Predatory mites and beetles eat fly larvae that live in manure, bedding and vegetation.
  - Parasitic wasps can lay eggs on the pupal stage of a fly in manure. The wasp egg hatches and develops into a larva which feeds on the fly pupa and kills it.
    - The photo on the right shows a *Diapetimorpha introita* wasp that is preparing to lay an egg in the pupal tunnel.
    - Manure cannot be excessively wet for these predators as it prevents larva movement and pupa destruction.
  - Some wasps feed by piercing through the outer protective layer of fly pupae and consumes them, resulting in fly death.
  - Certain fly parasites can only be used in specific geographic areas because they may feed on other beneficial insects, so check with your local extension specialist for recommendations.

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Photo from Scott Bauer/USDA ARS

Control of Adults

Controlling adult flies often involves the use of insecticides. Many pour-ons, sprays, or powders/dusts are approved for use on food producing animals. Talk with your veterinarian or local extension office for approved products in your area.

As with the use of any chemical, product labels should be read for proper use and any safety issues to animals or people. Proper precautions must be used when handling or applying them; some can be harmful or deadly to humans.

Directly applied animal products

- Whole body dips are common for full coverage, but can be expensive and labor intensive.
- Area sprays (knockdown) are fine mists of insecticide that rely on contact with the adult fly to kill it.
  - They should be used the same day they are mixed and applied in areas of high fly concentration because they do not last long in the environment (1-2 hours).
  - Due to evaporation, they should not be used at temperatures over 90°F and they are not effective at low temperatures (below 65oF).
  - If used in combination with predatory parasites, be sure to use products with a low toxicity to those species.
- Residual sprays are insecticides that can be applied to shaded surfaces where flies rest to kill them through contact.
  - Places such as barn walls, ceiling, rafters and calf hutches are commonly treated areas. Reapply after a rain as it will wash off the insecticide.
  - These cannot be used in dairy milking parlors.
- Dusters or dust bags that contain insecticide work well for pastured cattle, if the animals are forced to pass by them to get to feed, water or mineral.
  - Monitor the dusters for use; cattle should use them every 2-3 days to be effective.
  - To ensure insecticide is applied to the face, they should be placed low enough so cattle have to drop their heads to go through them.
  - There should be 2 dust bags for every 50-60 animals to ensure every animal has access.
  - With the smaller stature of calves, dusters must be hung at a level that is appropriate.
- Back rubbers or oilers are similar to dusters; they rely on contact with the insecticide but use an oil solution (diesel fuel #2) instead of dust.
  - Monitor the back rubbers for use; cattle should use them every 2-3 days to be effective.
  - To ensure insecticide is applied to their face, they should be placed low enough so cattle have to drop their heads to go through them.
  - Add insecticide every 2-4 weeks to maintain effectiveness.

Photo from University of Missouri Extension

- Pour-ons or sprays are absorbed by the animal and act to repel flies that feed on blood (as well as lice and grubs). They are directly applied to animals and have to be reapplied every 3 weeks in the case of horn flies. Pour-ons are more labor intensive than some other options listed here, but effective.

Insecticidal ear tags

- Impregnated ear tags can provide many weeks of protection against flies.
  - Due to resistance to pesticides, it is recommended to alternate between a pyrethroid ear tag and an organophosphate or a pyrethroid/organophosphate mixture every year.
  - Two ear tags are recommended for face fly control.
  - Read all labels and apply accordingly (only specifically labeled ear tags are to be used with lactating dairy animals).
  - Work with your veterinarian to select the best ear tags for your livestock.

Oral treatments

- Feed with larvicide in it passes through the cow and the product kills the larvae in the manure so that adults cannot emerge. They are very effective at killing developing flies but must be included in the feed ration at least 3 weeks prior to fly season.
  - For maximum efficacy, all animals on a farm and in a region must be treated or flies will deposit their eggs in untreated animal manure and adults will emerge.
- Boluses with insect growth regulators (IGR) have efficacy against flies and can be used early in the fly season to delay use of ear tags or use them late in the season to extend treatment.
  - These can affect non-target insects like the dung beetle and should only be used in high fly infestation areas.

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Baits

- Baits and fly traps have efficacy against house flies and can be used as part of a pest management program, especially in areas where chemical sprays are prohibited (dairy milking parlors).
- Baits should NOT be placed in areas where animals will have access to them or where they could fall and contaminate feed, water or milk.

It is a violation of state and federal law to use a pesticide in any manner that differs from the product label. Use only according to label directions to avoid meat or milk residue hazards, environmental damage, and animal or human injury.

FOR MORE INFORMATION

Common Flies in the United States. Center for Food Security and Public Health, Iowa State University, College of Veterinary Medicine

Integrated Pest Management (IPM) Principles. United States Environmental Protection Agency

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