

HOUSEFLIES



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EAST LANSING

All Kinds of Houseflies—

Pigs may be pigs, as a humorist once stated, but not all houseflies are the same. For example, here is a list of common houseflies. In this bulletin you will find suggestions regarding control measures for each kind.

Housefly	<i>Musca domestica</i>
Biting Housefly, "The Dog Fly"	<i>Stomoxys calcitrans</i>
Lesser Housefly	<i>Fannia canicularis</i>
True Stablefly	<i>Muscina stabulans</i>
Cluster Fly	<i>Pollenia rudis</i>
Window Fly	<i>Scenopinus fenestratis</i>
Large Blue-bottle Fly	<i>Calliphora vomitoria</i>
Green-bottle Fly	<i>Lucilia caesar</i>
Flesh Fly	<i>Sarcophaga</i> spp.
Cheese Skipper	<i>Piophilca caesi</i>
Pomace Fly	<i>Drosophila</i> spp.
Moth Fly	<i>Psychoda</i> spp.

HOUSEFLIES

By E. I. McDANIEL*

Many different kinds of flies find their way into houses. Of those, certain species are more to be dreaded than others because they breed in filthy places or have objectionable food habits. With few exceptions, such as cheese skippers, pomace flies, or moth flies, flies found in houses are so similar in appearance that only a specialist can distinguish one from another. All flies pass through four stages in their development—(1) the egg, (2) larva or maggot, (3) pupa, and (4) adult. Flies emerge from their pupal cases as full-grown individuals and do not increase in size with age; tiny flies are not the young of larger flies but are distinct species.

THE HOUSEFLY

About 95 per cent of all flies found in houses are houseflies. They are the most to be dreaded because of their filthy habits and because they are known to be the carrier of a number of different organisms detrimental to public health, including tuberculosis, typhoid fever, dysentery and diarrhoea.

Two weeks are required to complete a generation. The first eggs are deposited when the female is about 10 days old. Each female lays from 500 to 600 eggs, in batches of 75 to 100 or more, on fresh horse manure, human excrement, or any moist decaying animal or vegetable matter.

The mouthparts of the housefly are fitted for lapping or scrubbing and *not for piercing*; a housefly cannot bite. They live on liquid food and in order to reduce a solid to a liquid they regurgitate the contents of the stomach onto the surface, then take the solution back into the digestive tract. This reduces the stomach juices and creates an abnormal desire for liquid—the housefly is always thirsty. Light "fly specks" are regurgitated material rather than excrement.

Control

Prevention is the most satisfactory method of controlling houseflies. Eliminate the breeding places early in the season, and because fresh horse manure is the first choice of the fly this source should receive special attention from early spring until late fall. Where fresh manure is spread within 48 to 72 hours, it will dry before the larvae or maggots can complete development. Where manure is stacked on manure platforms so constructed that the larvae cannot reach dry soil they will not pupate. If fresh manure is stored in dark bins or pits it will not attract flies because they do not deposit eggs in dark places. Few flies breed in well-drained feedlots, and the fly population is reduced where animals are fed on sanitary concrete platforms.

Dispose of garbage and other rotting organic matter in such a way that it will not be attractive to flies; burying, burning, chemical treatment, or

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steam sterilization is suggested. Cover buried garbage with at least a foot of soil. Crude oils or used crank-case oil applied to garbage pits, garbage dumps, or city dumps, will kill the immature stages of flies and many other insects. This treatment is suggested only where the fertilizer value of the garbage is not a factor. A thorough application serves as a preventive measure, repelling flies for a time. Several applications are necessary during the season.

Borax water kills 90 per cent of the maggots on the surface of well-drained manure piles; it is not so effective on soggy, wet manure. It is particularly effective where employed as a sanitary measure around pig pens, chicken yards, or garbage pits. Manure so treated is injurious to some plants when used as a fertilizer. Most plants tolerate 15 tons of borax-treated manure per acre where borax has been used at the rate of 18 ounces to 30 gallons of water. The borax is stirred into the water and allowed to stand for 24 hours. Two and one-half gallons is sufficient to treat the manure from one horse for a day.

Hellebore has an advantage over other chemicals when used to treat manure because it does not affect the fertilizing value. Where fresh powder is available, use one-half pound in 10 gallons of water; allow to stand for about 24 hours. This treats about 10 bushels of manure. Mix only enough for immediate use, since hellebore decomposes. **(The liquid is poisonous to livestock.)**

Live steam is especially adapted for the sterilization of cattle cars, garbage wagons, and garbage containers. Where manure is treated with live steam, flies in all stages of development are killed, and the process of fermentation is not permanently stopped.

Outside Toilets—It is especially important to prevent flies from breeding or feeding in outside toilets. Make the building fly proof by screening windows and ventilators with screens or cloth and bank earth along the outside to close any opening between the pit and siding. Treat the repository at least every other day during the fly season with either a light application of powdered borax, calcium chloride, kerosene, or crude oil.

Palliative Measures

Fly poisons, fly sprays, and fly traps are palliative measures useful enough after an infestation has become established, but often too late to prevent an epidemic.

Fly Poisons—A satisfactory homemade fly poison may be made by combining one part of formalin with 19 parts of water. It is particularly attractive to flies and has the advantage over other fly poisons in that the flies die in the immediate vicinity of the poison. This poison is more effective when set in bright sunlight and when no other moisture is available. Several commercial fly sprays are marketed, the killing agent in most instances being arsenicals. In many of these the poison acts so slowly that the flies can distribute themselves throughout the building before they die. In any instance, it must be remembered that any fly poison is also poisonous to higher animals and must not be within the reach of children.

Fly Sprays—Most of the commercial fly sprays are oily extracts of pyrethrum. These are intended to be applied as a mist with a hand atomizer.

A good homemade fly spray for use around barns, pig-pens, or sheds

may be made by soaking 8 ounces of high-grade pyrethrum powder in a gallon of kerosene for 24 hours. The combination is stirred occasionally in the meanwhile, allowed to settle, and the clear liquid is poured off and used as a spray. The mixture is not suitable for indoor use because of the offensive nature of the kerosene. The spray is most effective when applied in the cool of the morning because the flies are settled at this time and more easily hit.

FLY TRAPS

The U. S. Department of Agriculture Farmers' Bulletin 734 gives some helpful suggestions on making and operating homemade fly traps. A serviceable fly trap may be made by using the following specifications:

1. For a top use a board 12 to 18 inches in diameter* with a hinged door 6 to 8 inches in diameter. (This is convenient when it is desirable to dump dead flies.)

2. For a base use a hoop of the same diameter as the top.

3. For sides use ordinary window screen, about 24 inches wide.

4. Three or four laths, or similar strips of wood—tack to the top and bottom, allowing them to project an inch or more below the base. This makes the frame rigid and raises the trap off the ground sufficiently to slip the bait in under the cone and to make it possible for the flies to reach the bait.

5. Inside the trap, insert a screen cone with an opening of about $\frac{3}{4}$ -inch at the top and reaching to at least 2 to 4 inches of the top of the cage.

Any bait attractive to flies is suggested; i.e., spoiled meat, fermenting fruits or vegetables. The bait should be renewed frequently. Traps will be less objectionable if they are cleaned frequently. The flies removed during this process should be burned or buried.

BITING HOUSEFLY

The biting housefly, or dog fly (stablefly), is primarily a livestock pest. It enters houses before a storm or during the first cool days of early autumn, attacking pets or humans. The awl-like mouthparts are fitted for piercing and sucking, giving rise to the belief "houseflies bite before a rain".

The adults live for a month or more. A life cycle is completed in from 25 to 60 days, and the females are from 18 to 20 days old before any eggs are laid. They seek wet, fermenting vegetation, such as accumulations along lake shores, damp garbage, under piles of green grass clippings, rotting hay or straw at the bases of old stacks, damp corners in feed troughs, or picked-over leavings in mangers, as breeding places. The eggs are laid in pocket-like nests in the solid material under loose trash. Each female lays from 600 to 800 eggs in four to six batches. The maggots require considerable moisture for their development, but they are seldom found in manure except where it contains a liberal amount of straw.

Control—Systematic cleaning of feed troughs and mangers will make it impossible for the maggots to complete their development in

*Square or rectangular cages are just as effective.

clean dry quarters. Treat the rotting bases of old stacks with crude oil or spread the rotting hay out to dry. The same treatment may be applied to accumulations of vegetation washed up along the shore line or any accumulations of grass clippings or rotting vegetation.

Fly sprays afford a degree of protection for a few hours at least. Several commercial brands are available, or a good homemade preparation may be made as follows:

Use an oil free from sulphur with the following specifications or better: Flash 104, gravity 47.6, color 26, initial boiling point 305, end point 423. Stir one-half pound pyrethrum (flora grade) into one gallon of oil, complying with the foregoing specifications, and allow the mixture to stand for 24 hours. Pour off the clear liquid and apply with an atomizer, using a very small amount at any one application.

Both the **lesser housefly** and the **true stablefly** occur in houses. They breed in the same places houseflies breed, but are not so dangerous because they are not attracted to prepared foods. The larvae of both species have been found in human intestines, probably taken in on raw vegetables or fruits. The mouthparts of the adults are similar to those of the housefly. The lesser housefly appears in numbers, earlier in the season than other flies, and may be the predominating species in houses at this time.

Cluster flies winter as adults in sheltered retreats. In the early fall they gather in houses, gathering back of pictures, in closets, behind drapes, or under rafters in the attic or basement. On warm, winter days or in the spring many individuals appear in the open either to hover in the air or to wander aimlessly about the windows. They are larger than the housefly. Their mouthparts are fitted for rasping and sucking. They are not attracted to food and except from the nuisance angle they are of no economic importance. If attic and basement screens are removed during the first warm days in spring, many flies will escape.

Window flies are the first flies to appear in houses in the spring. The black adults measure about one-fourth inch long and differ in appearance from other flies in having a flat blunt abdomen. The larvae are slender, thread-like, white worms about three-fourths inch long. They are predacious, feeding on the larval stages of clothes-moths or cereal moths.

Blowflies and flesh flies occasionally collect in houses during cool weather in mid-summer, or during the first chill of autumn. They are equally as repulsive as the housefly, because they not only breed in the same objectionable places but also infest open sores, wounds, carrion, and sometimes even living flesh. They are attracted to meats, fruits, and vegetables either cooked or raw. The following are common species:

(1) The **large blue-bottle fly** lays its eggs on either fresh meat, decaying meat, or open wounds, as well as excrement. A life cycle is completed in less than a month, and each female lays from 400 to 600 eggs.

(2) The **green-bottle fly** breeds in manure, human excrement, and in decaying or living flesh.

(3) *Sarcophaga haemorrhoidalis* is one of the flesh flies. It is primarily a scavenger with a wide range of food, including carrion and excrement. It deposits larvae rather than eggs, and about three weeks are required to complete a generation.

The adults of **cheese skippers** are small, slender, black flies. They lay their eggs on cured meats, cheese, raw hides, dead bodies of animals, or on excrement. The life cycle is completed in two weeks. The flies have a keen sense of smell and often are a problem around houses, cheese factories, packing houses, or grocery stores. They are very prolific, each female laying from 250 to 500 eggs.

The larva is a slender, cylindrical, white maggot about two-thirds inch long. The head end is pointed, the posterior end blunt. When a larva wishes to move, the head is bent until it touches the tail, then releasing the arc the larva is projected through space with a quick jerk, covering from 4 to 6 inches at a time. This method of locomotion earns them the name cheese skipper. Larval mines extend into the meat or cheese and, when ready to pupate, the mature larva migrates to the surface and pupates on the outside wrapping or it may migrate to cracks and crevices.

To control cheese skippers, trim the infested portion of cheese or meat and dispose of it in such a way the skippers will not reach maturity. The remaining portion is as good for food as before the infestation took place. Wire screen, 24 meshes to the inch, will exclude the adults. Cheeses properly wrapped, greased, or waxed and stored in a dark room are virtually safe, provided they are turned daily. Protect cured meat with gauze. The cheese skipper is difficult to kill. Sulphur fumigation, 3 pounds to each 1,000 cubic feet of space in a tight storage will destroy an infestation of cheese skippers. After fumigation, wash the walls, ceilings and woodwork thoroughly with hot soapsuds or lye water.

Pomace flies are so tiny they can pass back and forth through ordinary window screens. They are readily distinguished from other flies occurring in houses by their bright red eyes and delicate wings. Less than two weeks are required to complete a life cycle. The eggs are laid in over-ripe fruit, decaying garbage, pomace, vinegar, cooked fruit, and sometimes in ripe fruit in the orchard, garden, or vineyard. The adults are attracted to ferments, and are often troublesome in houses, restaurants, cafeterias, fruit stalls, or grocery stores. The larvae pupate on the outside of the container or on the fruit.

To control fruit flies, dispose of all over-ripe fruit or vegetables and burn or bury garbage. Clean garbage containers thoroughly with either soapsuds, chemicals, or live steam. Vaporized fly spray will kill adult flies. Make the application early in the evening to permit thorough airing in the morning. The adults are sensitive to temperature changes. Those in the open are killed by the first frost, and often an infestation may be controlled completely by leaving doors, windows, and ventilators open on a cold night.

Moth flies are tiny, non-blood-sucking insects. They differ from other flies about houses in that the wings rest roof-like over the body when at rest. They are common around cesspools and in filter beds

of sewage disposal plants; occasionally, they breed in houses, establish themselves in drain pipes, grooves in plumbing fixtures, damp basements, or in wet garbage. They increase rapidly, two weeks being necessary to complete a life cycle.

Flies from cesspools or filter beds are seldom a problem around houses. To control, cement all grooves in plumbing fixtures and clean receptacles and drains with kerosene. Circulate fresh air through basements and treat infested areas with kerosene or use a liberal application of lime or borax.