
CHAPTER 7

HOST ANIMALS AND THEIR PESTS

LEARNING OBJECTIVES:

After you finish studying this chapter you should be able to:

- Identify the primary arthropod pests of livestock in Michigan.
- Determine where specific pests are likely to be located on the host animal or bird.
- Monitor for pest injury or the presence of pests on host animals.
- Identify behavior of animals that may indicate the presence of pests.

The previous chapters presented information on groups of arthropods including identification, biology, their impact on animal hosts, and how to detect and manage them. This chapter provides a profile of the primary livestock groups in Michigan and reviews the arthropod pests that are associated with them. The livestock profiles include dairy cattle, beef cattle (confined or pasture), swine, sheep and goats, horses, and poultry. This information is intended as a summary focusing on the animal host. Refer to the previous chapters for detailed information on the individual arthropods.



DAIRY CATTLE

Dairy cattle maintained in typical dairy herd production systems (milk parlors, barns, drylots, loafing sheds, and pastures) are inflicted by house flies, stable flies, horn flies, face flies, mosquitoes, horse and deer flies, heel flies or cattle grubs, lice, and mites. The importance of these arthropods to animal health and to milk production, and to the corresponding monitoring and management practices required, depends upon the sex and age of the animals and their stage of management (e.g., first-year heifers on pasture vs. confined, freshened cows). For example, horn fly

and face fly will generally only be significant pests on cows and bulls in pastures and some drylots. Different arthropod pest activities vary seasonally, thus monitoring efforts must be adjusted accordingly.

Pest: House Flies

House flies are very common in dairy operations because the larvae or maggots occur in waste material such as manure. They are common summertime pests in feedlot and dairy barns. In large numbers, they annoy animals and people. Also, the flies may function as mechanical transmitters of some disease-causing microorganisms.

Monitoring: House flies can be monitored using fly speck cards or by visual inspection of the premises and animals.

Management: Sanitation is the primary management strategy for house flies. Use of insecticides to reduce fly numbers to more desirable, lower densities is a secondary strategy. Insecticide use includes premise sprays as residual treatments, space sprays, and animal feed-throughs. Use of insecticides to control maggots, other than feed-throughs, is not recommended.

Another management strategy includes the release of parasitic wasps which attack the immature stages (especially pupae) of house flies. This *biological control strategy* must be used in conjunction with sanitation and must be customized to local climates and conditions.

Pest: Stable Flies

Stable flies are biting flies, similar in appearance to house flies.

Monitoring Activities: These flies can be monitored by looking for the biting individuals on the bodies of animals, especially the legs, or by using sticky traps made of Alsynite panels covered with adhesives to capture the flies. Threshold densities of stable flies for control decisions have not been established.

Management: Any level of animal annoyance and discomfort should instigate fly management actions. Stable fly management requires good sanitation in the animal's environment. Maggots of stable flies occur in wet, decaying materials such as urine-soaked straw, wet, spilled feed, and straw-manure mixtures. Calf pens can attract and be a significant source of stable flies and house flies. Bedding in animal beds must be cleaned out and then replaced with fresh material—not merely be covered over with fresh material. Eliminate breeding sites to greatly reduce stable fly populations. Other stable fly management methods include those discussed for house flies—premise sprays as residual treatments, space sprays, and animal feed-throughs.

Pest: Horn and Face Fly

Both the horn fly and face fly occur in open, pasture settings and secondarily in drylots. These flies rest and feed directly on the animals. Horn flies are blood feeders and bite the host animal several times per day. Face fly feeding activity injures the eyes and introduces pink-eye bacteria. The females of both flies lay their eggs in freshly-voided manure.

Monitoring: Watch for peak populations of horn and face flies by late spring/early summer. Face flies are present throughout the season. Make visual inspections of the animals for the resting and feeding horn and face flies. Horn flies rest and feed along the backline of adult animals. Face flies aggregate on the face of the animals, feeding on eye secretions of both calves and cows. Also, watch for fly avoidance behaviors by the animals, such as when groups of animals bunch together to avoid fly strikes. Some studies suggest that these flies cause decreased milk production or decreased feeding efficiency. Thresholds to assist in management decisions for these flies have not been established for dairy cows but consideration of annoyance and discomfort of the animals are critical factors when deciding on management action.

Management: Horn fly management includes applying insecticides directly to the animal, either

as a pour-on, dust, spray, or insecticide-impregnated ear tags and supplemented with dust bags. For face fly management, options are limited but include the use of insecticide-impregnated ear tags attached to the animals and encouraging animals to move against dust bags, oilers and back rubbers that contain insecticides effective against the flies.

Pest: Biting Flies

Mosquitoes, black flies, midges, and deer and horse flies are all biting flies that are primarily pests of outdoor animals, especially those on pasture.

Monitoring for these pests is through direct examination of the animals. Presence of these biting flies on their bodies, and observation of abnormal animal behavior are indicative of annoyance by biting flies.

Management: Reduce biting fly problems by moving animals indoors where they are protected from biting insects. Biting flies can be managed with insecticides applied on the animals.

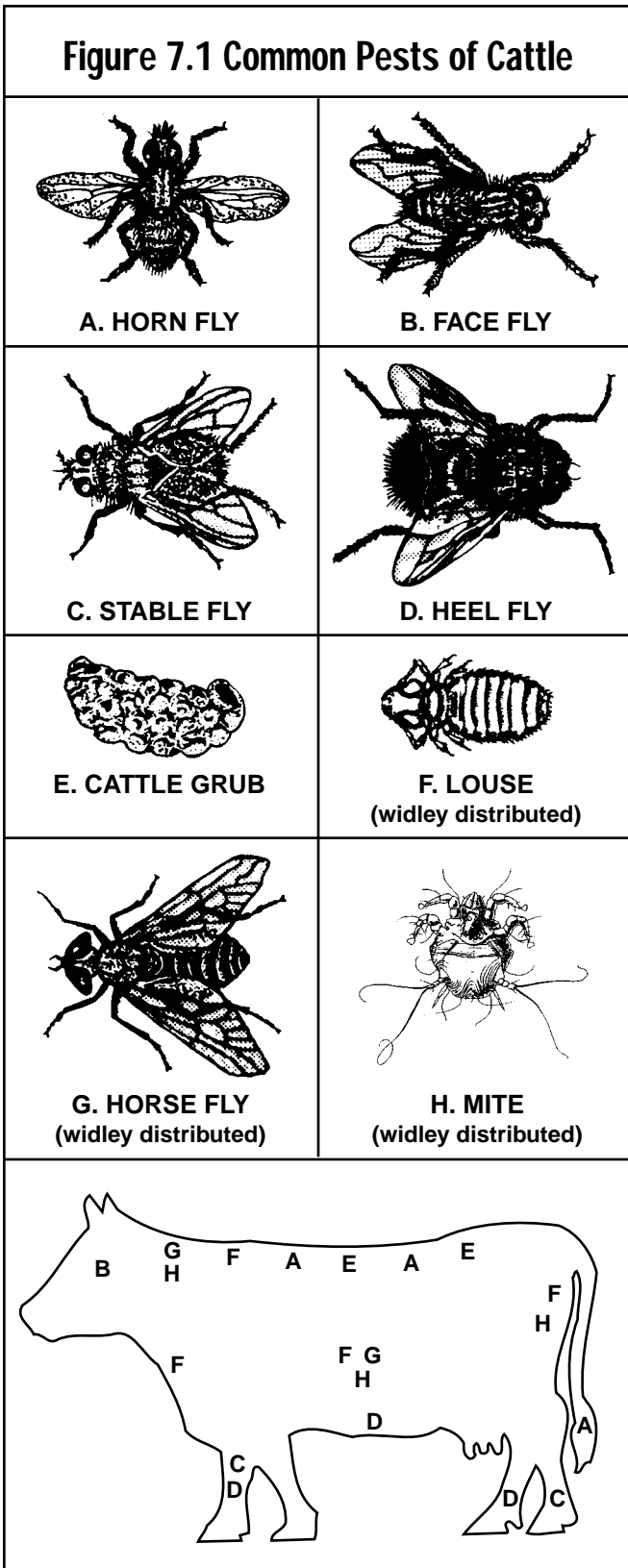
Pest: Cattle Grub or Heel Fly

The **cattle grub** or **heel fly** (two species of flies in northern states called the common cattle grub and the northern cattle grub) are pests of pastured heifers and other pastured dairy cows. The adult flies are active from spring to early fall and lay eggs on the body of the cows. The eggs hatch into larvae or grubs that burrow into the host animal. The grubs migrate through the body for several months before establishing warbles in the skin along the back. Cattle grubs damage the hide and cause deterioration of cattle condition.

Monitoring: Management of cattle grubs begins with monitoring the pastured animal's behavior. Kicking of their feet (gadding) and running about is evidence that they are attempting to escape buzzing, striking flies. The pest is known as a heel fly during this stage because they lay their eggs around the animal's heels, although some eggs may be laid on the belly. If producers witness this activity, expect grubs to appear in the animals in the fall. In fall, inspect cattle by feeling along the spine, especially of young animals, to detect the grubs in elevated areas of the skin called *warbles*. A hide with five or more warbles is downgraded.

Management: Successful control of this pest requires community-wide management. To kill the grubs, use a systemic insecticide or injectable drug. Make these applications or treatments before a fall cutoff period, when the grubs are around the animals' esophagus or the spinal cord. Grubs killed after the fall cutoff date may cause inflammation

Figure 7.1 Common Pests of Cattle



resulting in choking or paralysis of the host animal. Check with a veterinarian or other authority for the cutoff date in your area. In Michigan, treatment is typically before November 1.

Pest: Lice and Mange Mites

Dairy cattle may become infested with lice and mange mites particularly in the winter.

Monitoring: Observing the animal's general condition—coat appearance, presence of skin lesions—provides indications of lice or mite infestations. Animal behavior—excessive licking and scratching and rubbing against structures—also indicates the pest presence. Producers should monitor for eggs or lice and mites on a regular basis throughout the winter. Part the animal's hair and examine the hair and skin for the eggs and adults of these pests. Skin scrapes are more useful than surface examinations for determining the presence of burrowing mites.

Management: To prevent the spread of these pests, quarantine and monitor new animals before integrating them with existing herds. Oversee, separate and treat infested animals to prevent establishment of mange mite populations in herds.

Insecticides applied as high pressure sprays, pour-ons or dusts are the chemical approach to lice and mange mite control. For lice, two pesticide treatments at weekly or biweekly intervals may be necessary. Pesticides are not effective against eggs therefore, a second application is needed to kill the lice that hatch after the first treatment.

Sarcoptic mange management requires acaricide applications to control the mite as described in the mite and tick chapter. Pesticide treatments to lactating and nonlactating animals are different. Be sure to follow all appropriate precautions. Mites other than sarcoptic mites, can be controlled with the types of insecticide treatments used for lice.

For all arthropod pests of dairy cattle, it is extremely important to use treatments that conform to regulations regarding withholding times and residue tolerances for milk. Some treatments may be acceptable for nonlactating cows and for beef cattle, but may not be acceptable for milk cows. Use of many systemics is prohibited for milking cows. Consult veterinarians, dairy extension specialists, and pesticide labels for information about restrictions and rates of applications.

CONFINED CATTLE

The arthropod pests of confined beef cattle are similar to those that inflict dairy cattle. Manure management strategies which are important to reduce pest pressures will differ because of the different housing and operational conditions between confined beef cattle and dairy cows. For

example, sanitation and maintenance of fly-free conditions in milk parlors is critical but does not reflect the low level but tolerable fly thresholds in beef cattle environments. Confined beef cattle are generally not bothered by the open pasture fly pests—horn fly and face fly. Although, these flies occasionally become problems on feedlots (especially face fly on steers and horn fly on isolated bulls). Grubs may be a problem in confinement if the cattle are brought in from pasture or range for finishing rations. The other arthropods (house fly, stable fly, lice, and mites) can be important pests in confined beef cattle operations. Monitoring and management activities for the pests of confined beef are the same as for dairy cattle listed above.

RANGE AND PASTURE CATTLE

The arthropod pests of pastured or rangeland cattle differ somewhat from dairy and confined cattle. Horn flies and face flies are more important than house flies and stable flies. Biting flies, such as deer flies and horse flies, are relatively important pests of range and pasture animals. Cattle grubs are also important pests of pastured cattle. Lice and mange mites may infest pastured cattle as well. In some areas, ticks are serious pests of rangeland cattle. Monitoring and management methods for arthropod pests are similar to those described for the dairy and confined cattle.



SWINE

Pests: Hog Louse and Mange Mites

The primary arthropod pests of swine are the hog louse and mange mites. Both of these pests are obligate ectoparasites on the skin of swine. Hog lice are very large (compared with other lice), and can be detected on the hog's body in clumps, particularly around the neck and ears.

Monitoring: Signs of excessive scratching or irritation by the animal are indications that a pest problem exists. Direct examination of the animals' skin is the best method for detecting a lice or mite infestation. Pay close attention to the neck and ear area.

Mange mites are very tiny and burrow into the skin, thus they are not directly visible. Scraping of the skin surface, especially at crusty areas where

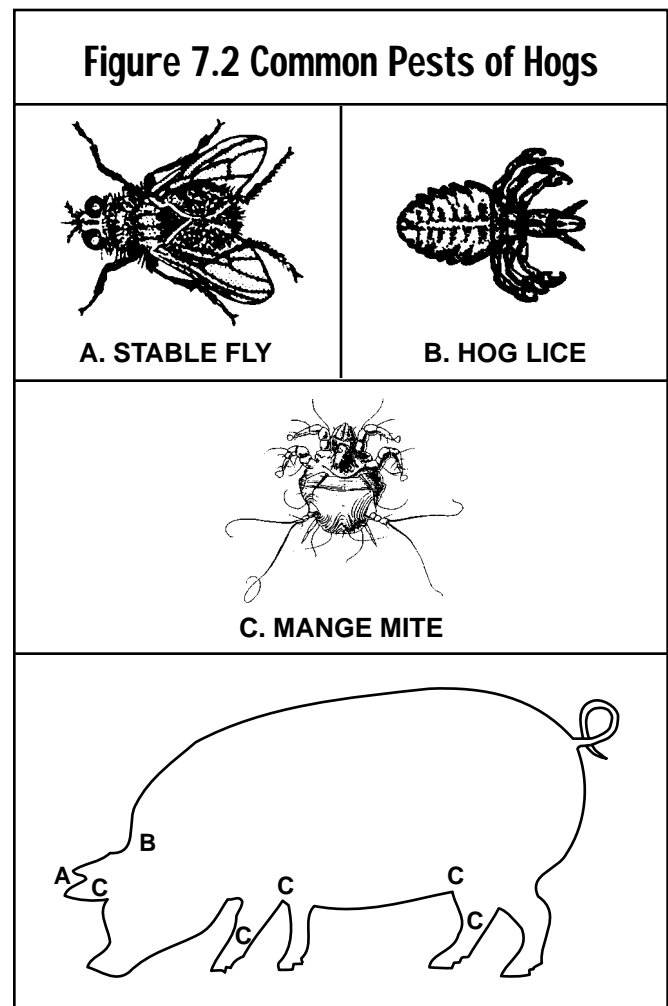
mite infestations exist, yields a small skin sample that can be examined under a microscope to confirm the presence of mites and mite burrows.

Management: Hog lice and mange mite management involves sanitation through cultural methods, monitoring and pesticide treatment. Sanitation entails culling chronically-infected individuals, treatment of sows before farrowing to prevent transfer of lice or mites from sows to young pigs, purchasing louse- and mite-free hogs, and quarantining newly acquired hogs.

Direct application of high-pressure acaricides sprays onto the skin of the hogs, or use of injectable acaricides are used for mange mite control. Louse control requires similar methods. The chapter on mites and ticks discusses louse and mite control on swine in detail.

Pest: Flies

House fly and stable fly populations occur in association with animal waste and other waste materials at swine operations. Biting insects such as mosquitoes and deer flies, also bite and annoy hogs.



Monitor and employ general fly management activities—sanitation, as used in confined cattle operations. See the appropriate management options for biting flies described for cattle and in chapter six, “Flies.”

Pest: Fleas

Fleas can be pests of hogs when populations become established in confined, production facilities. The adult fleas spend most or all of their time on the animal, while the larval fleas live in the bedding material and cracks and crevices near where the hogs are confined.

Monitoring: Watch the animals for excessive scratching and rubbing. Directly inspect the animal’s bodies for adult fleas.

Management: Control fleas with sanitation efforts—eliminate eggs, larvae and larval habitat. If large populations exist, crack and crevice and premise sprays of insecticides may be necessary to bring the problem under control.



SHEEP AND GOATS

The arthropod pests of sheep and goats include flies associated with manure, as well as arthropods that either blood feed on these animals, annoy them, or infest their wool, skin or other tissues. Sheep have a larger number of pests than goats.

Pest: Biting flies

Mosquitoes, deer and horse flies, and biting midges can severely affect sheep and goats.

Monitoring: Watch for biting fly activity around the animals. Presence of biting *stable flies* on animals indicates that improved sanitation is required to reduce fly numbers.

Management: Due to their association with manure and waste materials such as wet straw, large stable fly populations can develop among sheep and goats, in and around barns and out-buildings. House flies may also occur because of accumulated manure from sheep and goats. Improve manure sanitation measures to reduce stable fly and house fly populations.

Pest: Lice

A variety of lice occur on both sheep and goats. Lice are a minor problem on goats compared to sheep. Their impact varies with the general health and condition of the individual animals, the type of lice, and the nature of the wool fleece — fine or thick.

Monitoring: . Most lice are problematic in the winter months with the exception of the foot louse. Foot louse is most abundant in warmer months. Animals with a ragged fleece, and those that are rubbing and scratching excessively, are likely to be heavily infested. Make several spot checks over the animal’s entire body. Locate lice by parting the wool and examine the base of hair next to the skin. The location of the lice may help with identifying the lice species.

On sheep, the sheep biting louse is most common and is widely distributed over the body. The foot louse is usually contained on the animal’s legs. Face and body louse are on all parts of the body except the limbs. When populations are low, the face and body louse is only on the face.

On goats, the goat biting louse is widely distributed as is the Angora biting louse specifically on Angora goats. The face and body louse is on all parts of the body except the limbs. Low level populations of the face and body louse are only found on the animal’s face.

Management: Apply low pressure insecticide sprays and dusts for control of sheep lice. A detergent in the spray increases the sticking ability of the insecticide. Shearing removes lice populations from the animal.

Pest: Sheep Keds

Sheep keds are wingless, blood-feeding flies similar in appearance to ticks. Their feeding deprives the sheep of nutrition. They are rarely pests on goats.

Monitoring: Sheep keds can be found throughout the year in sheep wool. Blood-feeding by the keds stains the wool and provides evidence of their presence. Inspect the belly and neck by parting the wool to detect sheep keds.

Management: Apply insecticide to each individual in the entire flock to effectively reduce sheep keds. The appropriate method of insecticide application depends on flock size and the availability of facilities and labor. Dips, sprays, dusts, and pour-ons are all acceptable methods of application. Shearing removes sheep keds from the animal.

Pest: Mange Mite on Sheep

The primary mange mite of importance on sheep is the non-burrowing mange mite (*Psoroptes ovis*). It infests the skin and causes a condition called sheep scab. Other mites of the *Chorioptes* group also infest sheep. Mange mites are a problem throughout the year.

Monitoring: Detect mite infestations by looking for signs of sheep scab—shabby appearance of the fleece, excessive scratching and rubbing. Take skin scrapings and make microscopic observations to determine mite presence. Cull the chronically infected individuals to prevent transmission to non-infected animals.

Management: Dipping with approved acaricides is the preferred mite management method for sheep.

Pest: Wool Maggots on Sheep

Wool maggots are fly larvae that hatch from eggs laid in the waste and moisture that accumulates around the tail and hind legs of sheep. Adult wool maggots are blow flies. The maggots invade the fleece and can cause skin injury.

Monitoring: Adult wool maggot flies are active in the summer. They are attracted to soiled animals and lay their eggs in soiled wool. Inspect sheep for wool maggots by examining wool at the breech and look for manure-laden tags of wool that harbor maggots.

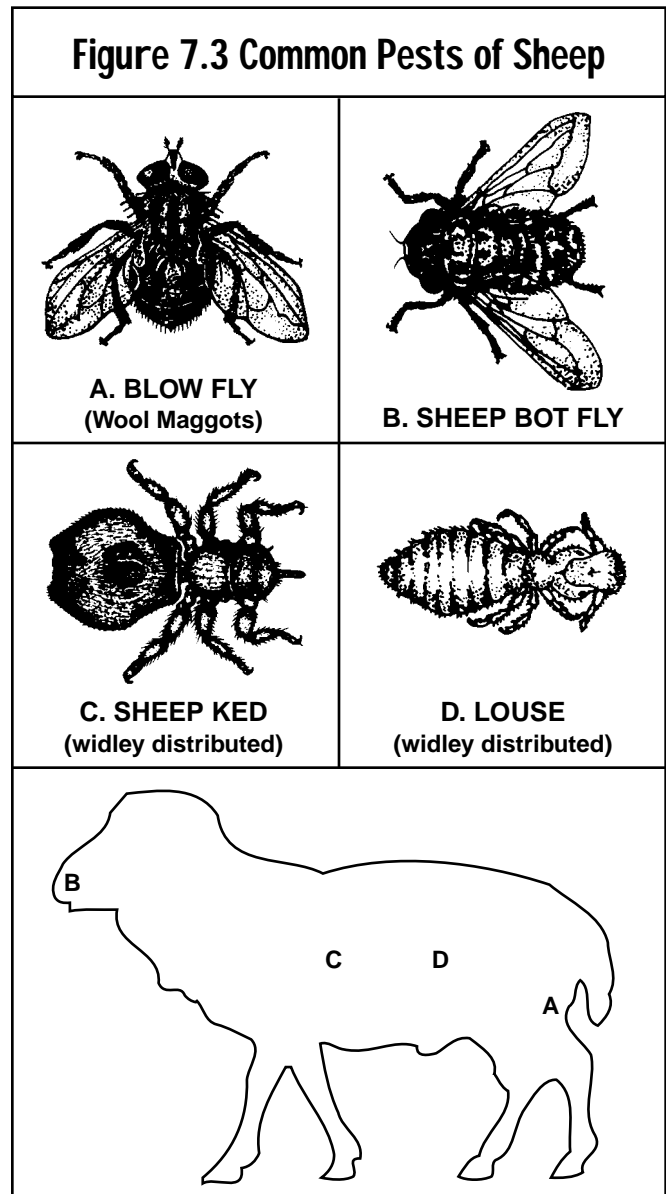
Management: Keep animals clean. Combine shearing with early season lambing (to remove the breech of ewes that becomes contaminated with birthing material) to prevent wool maggot occurrence. If infestations occur, local or spot treatment of infestations with insecticides is an effective management method.

Pest: Sheep Bot Fly

Maggots of the sheep bot fly (or head grubs) live in the nostrils of sheep, feeding on mucus. The adult flies lay live larvae (not eggs) into the sheep's nose.

Monitoring: Sheep hold their heads low or in a corner to escape the striking behavior of flies. Fly activity occurs throughout the summer. Observe sheep behavior and inspect for presence of grubs in the nostrils.

Management: Ivermectin drenches control sheep bot fly problems.



HORSES

The arthropod pests of horses include biting flies, nonbiting flies, bot flies, lice and mange mites.

Pest: Biting Flies

Biting flies such as mosquitoes, deer and horse flies, black flies, and biting midges are very important pests of horses, particularly those that are pastured. Monitor and control biting flies using the methods described for cattle above.

The stable fly is associated with manure and waste materials such as wet straw. Large populations develop in poorly maintained horse

barns and stables. Presence of biting stable flies on animals indicates that improved sanitation is required to reduce the numbers of flies.

Monitoring: Directly observe the bodies of the horses for presence of the biting flies. Also, observe the horse's behavior watching for signs of irritation and annoyance caused by the flies.

Management of biting flies varies with the kind of fly. Consult chapter six, Flies for this information.

Pest: Filth Flies

Filth flies, such as house flies, occur because of accumulated manure. Reduce manure to reduce house fly densities and their annoying activities.

Sometimes, face flies are attracted to horses and use them as hosts. Horses kept in pastures are at greatest risk.

Pest: Bot Flies

The bot flies affecting horses involve three different species. All species affect the stomach. The adult flies lay eggs directly on the horses, either on the legs, nose or on hairs under the horse's jaw. Larvae hatch in three to five days, crawl to the mouth and burrow into the gums, lips or tongue. After a period of development, the larvae migrate to the stomach. The burrowing activity of the larvae is very irritating to horses, and the presence of bots in the stomach can disrupt digestion and cause other problems.

Monitoring: Adult bot flies are active throughout the summer. Observe horse behavior during "fly strike" (when the flies are laying their eggs). Examine the horses for wounds in the mouth and presence of eggs.

Management: Apply insecticides by sponge or wet spray directly to the hair coat to kill the bot fly eggs. If wounds are found in the mouth, contact a veterinarian for further assistance with bot fly control. Bots in the stomach are controlled with orally-administered insecticides or drugs. The drugs are often formulated as a paste applied with a syringe into the horse's mouth.

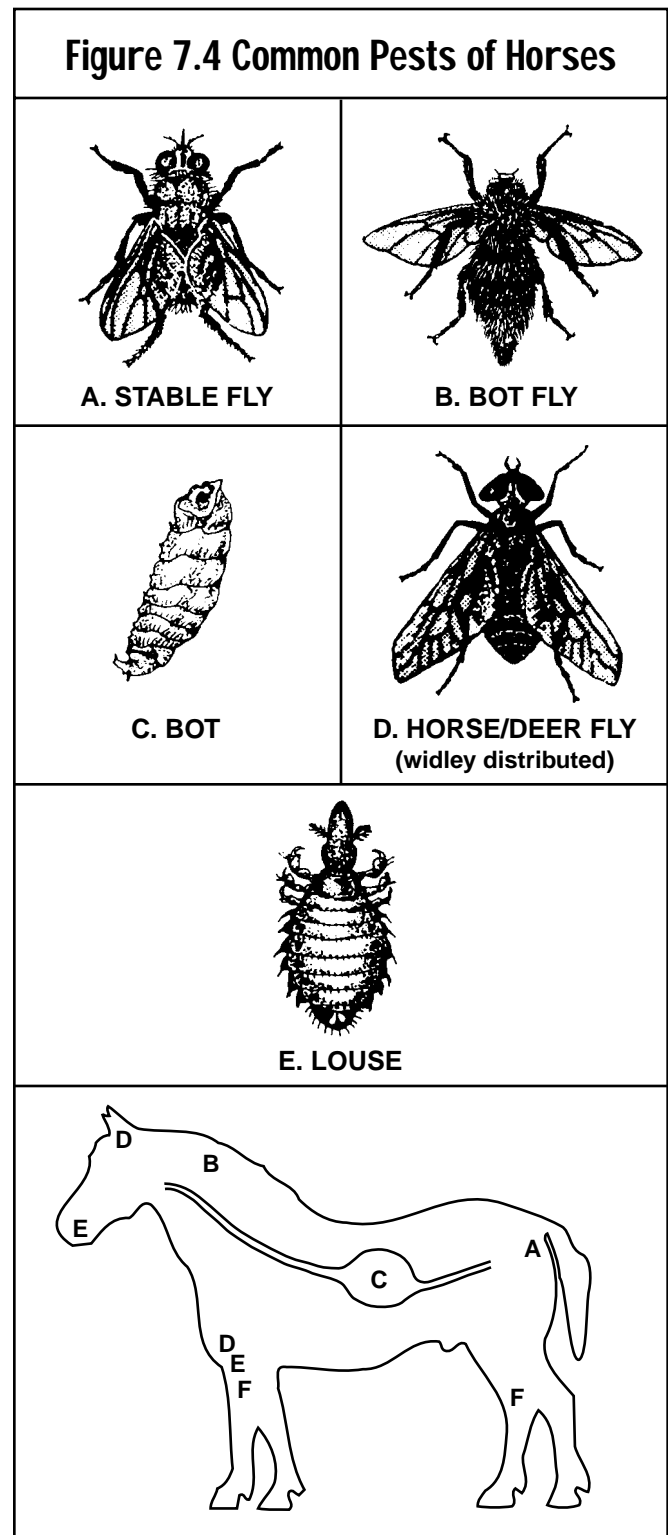
Pest: Lice and Mange Mites

Both lice and mange mites infest horses.

Monitoring: For both lice and mange mites, inspect the horse's hair coat for these pests, or for signs of damage caused by them. Also, a general deteriorated condition of the animal can be an indicator of infestation by lice or mange mites.

Management: Routine grooming reduces the chance of lice or mite populations from becoming

established. Control existing lice and mites by rubbing or brushing appropriate acaricides or insecticides into the hair coat, and treating tack, saddles and blankets. Mites are more difficult to kill than lice.





POULTRY

The arthropod pests of poultry that infest the bodies of the birds include bed bugs, ticks, lice and mites. Annoying insects associated with accumulated manure, such as filth flies, are potential problems in poultry operations (humans may be more annoyed than the poultry). Darkling beetles may invade the structure of poultry facilities.

Pests: Northern Fowl Mite

The northern fowl mite infests the bodies of birds, and also occurs in nests and houses. The mites are active night feeders. The mites suck blood, creating wounds which develop into dermatitis that can further become infected with bacteria.

Monitoring and detection: Northern fowl mites are active throughout the year. Examine the vent area of potentially-infested birds for presence of darkened feathers which is caused by dried blood. The mites may also be seen. Monitor the birds regularly (biweekly).

Management: Prevent the introduction of mites by eliminating infested birds and taking precautions to integrate only pest-free birds. Once mites have become established, use of cultural practices to reduce mite habitat and to prevent transfer of mites from infested to uninfested areas is important.

Acaricides are an important element used in mite management. Poultry must be sprayed thoroughly with a high power sprayer. Liquid pesticides are preferable to dusts for northern fowl mite management. The premise may also require pesticide treatments to rid the building of northern fowl mites.

Pests: Lice

Many species of lice infest chickens and turkeys, but the species of most concern is the **chicken body louse**. Body lice feed on skin scales.

Monitoring: Body lice on chickens are found close to where the feathers meet the skin. The eggs appear as white clusters on the feather shafts, while the lice are yellowish-white and can be seen on feathers and skin. Poultry lice are usually more common in the summer than in the winter. During this time, examine the feather shafts and skin for chicken body lice and the northern fowl mite.

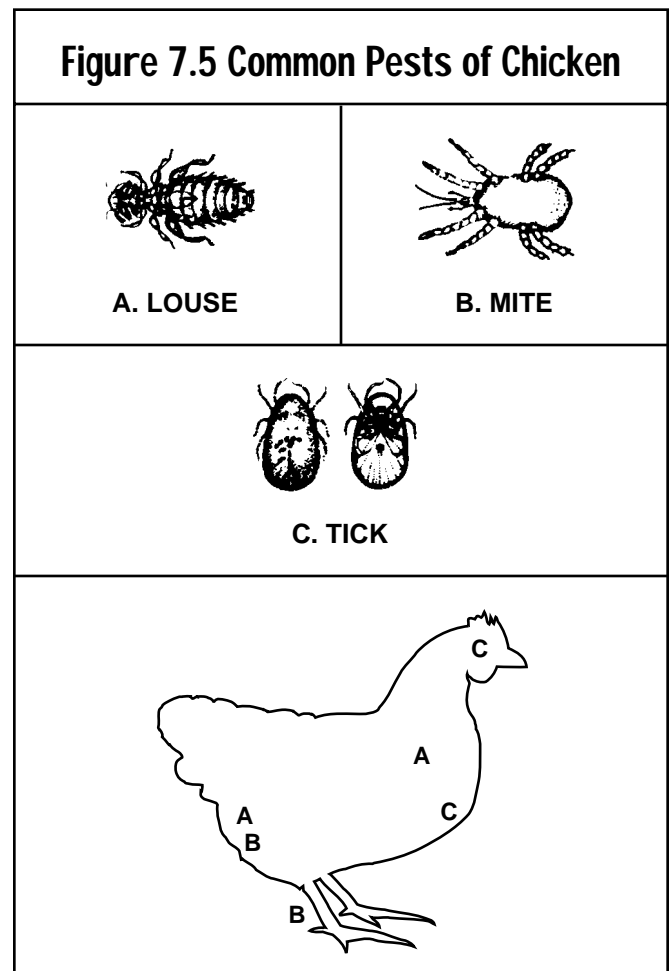
Management of lice on poultry requires application of wettable powder sprays or emulsifiable concentrate insecticides to the bodies of the birds, and dusts to the nest boxes and litter.

Pest: Filth Flies

Accumulations of manure in poultry houses provide habitat for a variety of arthropods, some of which may be pests. For example, maggots of several different species of flies (filth flies) live in manure.

Management: Manure management is an important component of filth fly management for poultry production systems. Manure management strategies will vary with the kind of production system (layer house, broiler house, turkey house, etc.). Maintain dry manure to eliminate fly maggot habitat —moist conditions are required for maggot survival.

There are many predators and parasites of the pest insects. It is important to preserve the natural enemies of the pest insects that occur in poultry manure. Thus, avoid direct insecticide applications onto manure which kills beneficial arthropods living in it.





Chapter 7 – Review Questions

Write the answers to the following questions and then check your answers with those in the back of this manual.

- Dairy cattle have lice and mange mite problems primarily in the:
 - Spring
 - Summer
 - Fall
 - Winter
- Horn and face flies lay their eggs in:
 - The animal's skin.
 - Fresh manure.
 - Pasture settings only.
 - The base of the horns.
- Confined beef cattle experience similar pests as dairy cattle. (True or False)
- The primary arthropod pest(s) of swine in Michigan is(are):
 - Hog louse.
 - Flies.
 - Fleas.
 - Mange mites.
 - A and D
- What four cultural practices reduce the spread of lice and mange mites on swine?
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- What part of the sheep's body should be inspected when looking for sheep keds?
 - Back legs.
 - Ears.
 - Belly and neck.
 - Along the backbone.
- Which arthropod pest requires skin scrapings and microscope-aided examination to confirm its presence in a host animal?
 - Wool maggots.
 - Mange mites.
 - Bot fly.
 - Ticks.
- The bot flies that affect horses include four different species that affect the host animals' lungs. (True or False)
- When managing filth fly populations, what is the most effective management activity?
 - Putting ear tags on animals.
 - Hanging fly strips and making premise sprays of insecticides.
 - Releasing parasitic wasps.
 - Improving manure management techniques.
- What body area on poultry should be inspected for northern fowl mites?
 - Vent.
 - Combs.
 - Feet.
 - Under wings.