Livestock Odor Control Plan

Travis Popham

System Design

1. Neighbor consideration and system location relative to pre-dominate wind.
2. Consider planning tree for visual appearance and wind disruption
3. System and building design (i.e. waste storage, ventilation, etc)

Feed Management

1. Balanced feed rations to reduce manure excreted, ammonium gases, etc
2. Reduce feed waste

Facility Maintenance

1. Maintain a clean facility – regularly clean
2. Maintain and reduce feed spills
3. Properly and timely take care of mortality
4. Dust control from and around building and building site
5. Consider manure additives

Manure Application

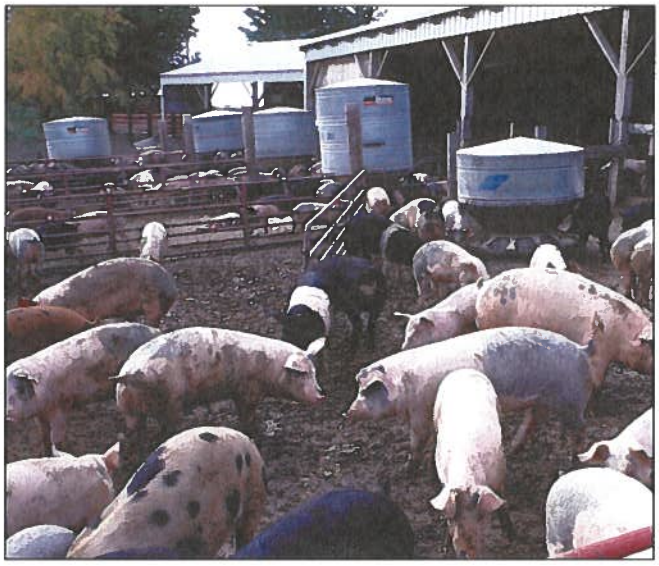
1. Attempt to time manure application during periods of low wind and/or dispersion periods.
2. Inject or incorporate manure at time of application to reduce odor
3. Don't apply manure within close proximity of neighbors – may want to consult neighbor before hand for consideration

NRCS
Natural Resources Conservation Service

Odor Control
Small Scale Solutions for your Farm

Do you have a problem with odor from your livestock operation?

- Complaints from neighbors
- Have to close the windows when the wind changes?
- Can the neighbors tell when you are spreading manure?
- Do you store manure where everyone can see it?
- Has DNR gotten complaints about your operation?



If it looks dirty and smelly, it probably is.

What can you do about livestock odors?

Livestock production can smell. The causes vary greatly. It may not be possible to eliminate all odors from livestock operations, but it is possible to manage the odor.

Here's how controlling odor from livestock can help your operation:

- Fewer complaints from neighbors
- Cleaner, healthier animals
- Sleep with the windows open at night

Clean dry animals do not smell as bad. Photo: Creekside Meadow Farms

Costs and Benefits:

How much does it cost?
Costs can vary depending on what you need to do. Changing the way you handle manure can be relatively cheap unless you need to buy new equipment. If you are starting a new livestock operation, making the right decisions up front can save money in the long run. Getting odors under control will take time but if you get fewer complaints it will save you time and money in the end.

Odor Control

Properly Locate the Facility

The further an animal operation is from its neighbors, the better. Odors from an livestock operation often follow the same path as runoff from rainfall; therefore, an alternative site may avoid odor complaints.

Keeping the Animals Clean, Dry, and Healthy

Clean, dry, and healthy animals smell less. Dirty, manure-covered animals are not as healthy as clean animals and dust from animals carries odor.

Minimize Dust

There is a link between dust and smells from livestock operations. Dust particles adsorb and concentrate smells. As the dust particles are carried by the wind, so is the smell. Most farm dust comes from feed, manure and, in the case of poultry, from feathers and litter. Buildings should be cleaned to reduce dust between batches of animals.

Proper Disposal of Dead Animals

Dead animals stink. Normal mortality from livestock operations *must* be properly handled for both odor control and to prevent the spread of diseases.

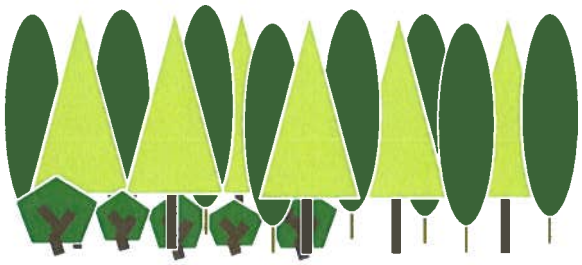
Dead animals can be a significant source of odors

Good Fly and Rodent Control Programs

These programs must be a continuous process on the farm. When feed and manure products are properly stored and handled, these problems are minimized.

Use Trees

While trees should not grow too close to buildings, wind breaks of trees correctly positioned near a facility create a visual barrier and also provide a large filtration surface for dust and odor control. Trees can adsorb odor gasses and create turbulence that disperses odor. Trees also cool the area around the facility, which can reduce odors.



Use Covers

Manure storage ponds and tanks can be a source of strong odors. Covers over a manure storage can reduce odors.

Chopped cornstalks or straw make a cover over a manure pond to reduce odors

Synthetic covers, although expensive, can provide for methane gas recovery and utilization. Straw covers are much cheaper and can be effective in reducing odors. The straw must occasionally be replaced. The straw cover is land applied with the stored manure.

Manage Lagoons

When properly sized and managed, a lagoon can be operated with a minimum of disagreeable odor. Don't "shock load" the lagoon. The manure entering the lagoon should be as continuous and frequent as possible. Lagoons with pH of 6.5 or less have more odors.

If you can separate the solids from the manure mixture, this will dilute the liquid manure being treated in the lagoon and cause less odor. The solids can be composted and land applied.

Properly Land-apply Manure

Apply manure only to crops at the recommended rates. Avoid application during windy periods. Pressure on sprinklers used to apply wastewater must be high enough for uniform distribution patterns, but not so high that the wastewater drifts. Turning the waste into the soil will reduce odors.

Throwing manure into the air when spreading can increase odors and complaints from neighbors

Help is Available

NRCS Natural Resources Conservation Service

SMALL SCALE SOLUTIONS FOR YOUR FARM

Technical Help Is Available

Your local Natural Resources Conservation Service (NRCS) office has experienced conservationists that can assist you with odor control. They can also help you develop a Conservation Plan to solve other problems you have identified on your farm.

There is no charge for our assistance. Simply call your local office at the number listed below to set up an appointment and we will come to your farm.

You may also be eligible to receive financial assistance, through a state or federal program. Your NRCS office will explain any programs that are available so you can make the best decision for your operation. All NRCS programs and services are voluntary.

Helping People Help the Land

For More Information Contact the:

Natural Resources Conservation Service

www.nrcs.usda.gov

Find your local NRCS office at http://offices.sc.egov.usda.gov/locator/app

January 2009

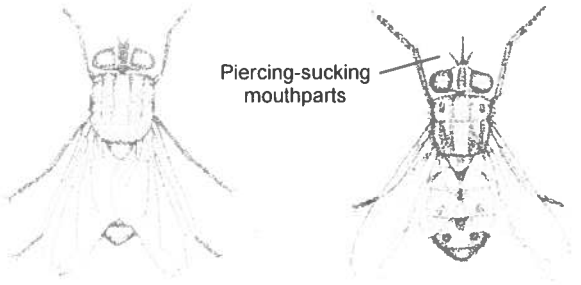
A2118

Identifying and Controlling Flies

On dairy, beef, other livestock and pets

W.L. Gojmerac

Among the more common flies associated with livestock are the house, face, stable, horn, deer and horsefly. Before starting control procedures, it is important to accurately identify them since their behavior, life cycle, and sites where larvae develop are different. For example, horn and face fly larvae develop only in fresh cow manure in the pasture, deer and horsefly larvae in swamps, and house and stable fly larvae in decaying organic matter. The following descriptions will enable you to identify the type of fly which is causing problems.



House Fly Stable Fly

Identification

House Fly

Description: The house fly is well known because it is generally near human and animal habitations. The fly is gray in color with four dark stripes down its back and the face is slightly straw colored. It feeds with a swabbing type mouth rather than a blood-sucking type. The house fly is about 1/4 inch long. While most important as a disease carrier, house flies also disturb cattle. They are most active on hot, sunny days.

Life History: Adult flies become active in April and May and lay eggs in batches of 100–150 in manure and garbage. Up to four layings have been noted. Eggs hatch in about 24 hours. Maggots have fully grown in about 7–10 days and then pupate. At the end of the pupation period, flies emerge and in several days lay eggs. In hot weather, populations increase rapidly because the life cycle requires only 10–14 days; but during cooler periods, the life cycle may be as long as 2–3 months. Normally the maggots or pupae overwinter, but often adults survive in heated buildings or barns.

Stable Fly

Description: The stable fly is similar in appearance and size to the house fly except that it has well-developed black, piercing-sucking mouth parts. The back and abdomen have several large spots on them. When not on cattle, the stable fly likes to rest in the shade on wooden posts, trees, and buildings. The stable fly prefers to attack active animals rather than those at rest. Ears and legs of cattle are the parts most often fed upon, and without control, numbers of flies are particularly noticeable on the legs of cattle. The stable fly generally feeds upwards, and attacks cattle only during the day.

Life History: Stable flies lay their eggs in manure and decaying vegetation. Egg laying is started only after the female has consumed three blood meals which may be as soon as 9 days after the fly emerges. The cycle from egg to adult takes about a month and there may be several generations per year. Maggots and pupae overwinter in strawy manure.

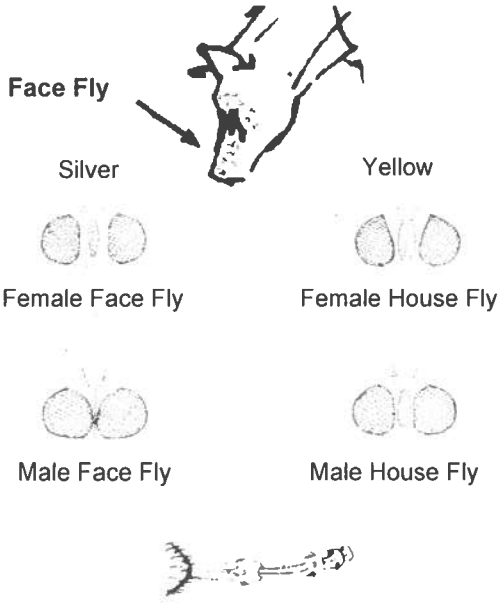
Face Fly

Description: In size and appearance the face fly is nearly identical to the house fly and it takes an expert to distinguish between them; however, the face fly can usually be identified by its location on the cow. Face flies congregate in large numbers around the heads of cattle, particularly those moist areas caused by tears and saliva. This is very annoying to a cow and can cause reductions in weight gains or milk production. Pink eye and blindness in cattle are believed to be spread by this fly as it swabs up mucus and moisture about the eyes. In summer the face fly often rests in the sunlight on wooden posts and feed bunkers where cattle are kept.

There is a positive method for distinguishing between face flies and house flies, but it is necessary to catch the fly. The female face fly has a silvery face; the female house fly has a yellowish face. Females can be distinguished by squeezing their abdomen. This causes the ovipositor or egg laying structure to extend from the tip of the abdomen. No similar structure is present in males. The eyes of male face flies almost meet in the center of the head but the eyes of the male house fly are well separated. With a little practice, it becomes unnecessary to capture the fly to make such distinctions.

Life History: The life cycle of the face fly is nearly identical with that of the house fly, except that a face fly can lay as many as 1500 eggs in its life span. Eggs are laid and

larvae develop in fresh cow manure in pastures. The fly often overwinters in houses and when numerous become a household pest on warm winter and spring days.



Horn Fly

Description: The horn fly is about half the size of a house fly (slightly more than 1/8 inch), dark gray in color, and has piercing-sucking mouth parts. The horn fly remains on cattle day and night, leaving only to lay eggs in freshly dropped cow manure. Horn flies feed primarily on withers, around the horns, and along the back. They generally feed facing downwards. During hot weather or rains, the flies may move to the belly and on cool nights may cluster around the udder. The adults live about 3 weeks and feed exclusively on cattle blood. The annoyance caused by horn flies causes milk production and weight gains to be reduced.

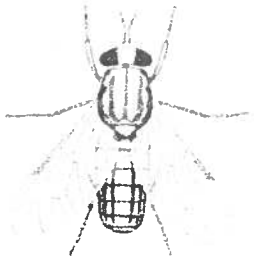
Life History: Horn flies lay their eggs in fresh cow manure where the maggots can feed. The eggs hatch in about 20 hours and maggots develop for about 5 days before pupating. At the end of a 5-day pupation period, the flies emerge and within 3 hours begin feeding on a cow. By the third day the females can begin laying eggs. Only about 20 eggs are produced per batch, but a female may lay up to 400 eggs in her lifetime. Maggots and pupae overwinter in manure.

Horn Fly

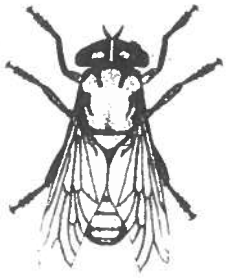
Deer Fly

Description: Deer flies are a little larger than house flies and the body is yellow with brown stripes. The wings have conspicuous brown bands and the mouth parts are the piercing-sucking type. Deer flies are heavy feeders, and wounds they make by feeding may bleed after an attack. They are daytime feeders and most active on hot days.

Life History: Eggs are usually attached to vegetation above water or moist ground. Upon hatching, the larvae drop into the soil and spend one to several winters here, before maturing in pupae and finally emerging as adults.



Deer Fly



Horse Fly

Horse Fly

Description: Horse flies are the largest and most easily recognized cattle pests in Wisconsin. There are several species of horse flies in Wisconsin; however, all can be recognized as horse flies by their large size, their large rounded eyes, and the loud buzzing they make while in flight. The females have large, piercing-sucking mouth parts which inflict painful wounds. The males are harmless flower feeders. Biting is usually confined to the back with only a few flies on a cow at one time. They attack cattle only during the day and are most active on hot days.

Life History: See deer fly.

Control

Livestock Operations

Good sanitation is required if house and stable fly population are to be kept at a minimum. Weekly cleanout of calf pens, hutches and box stalls is a must. Don't forget the accumulated feed, especially under drinking cups.

Flies can and will breed in manure that accumulates in exercise yards around feed bunks, fence lines and any place not trampled by cattle. If cattle are kept in the exercise yard during the summer, you will have more fly problems than if cattle are pastured away from farm buildings—manure handling and feed storage facilities will require special attention.

Health and milk quality control officials specify how often gutters should be cleaned. But remember, flies also breed in decaying feed, in manure that accumulates around sprockets of the barn cleaner and in recesses, corners and crevices where manure has accumulated longer than one week.

Dairy Cattle

The selection of fly sprays for use on dairy cattle is important. Using the wrong product could not only injure the animal, but might contaminate its milk with an illegal residue. Products approved for use on dairy cattle by state and federal authorities are safe and will not contaminate milk when used properly. Be sure the label states this approval and follow directions exactly.

Several coumaphos (CO-RAL), dichlorvos (Vapona), permethrin (Ectiban, Atroban), pyrethrins and tetrachlorvinphos (Rabon) products are available and registered for use on dairy cattle. They can be purchased as a ready-to-use mixture or as a concentrate to be mixed with water. Naled (Dibrom) can be used in the dairy barn but not in the milk room or milk house. Coumaphos (CO-RAL), malathion, methoxychlor, permethrin (Ectiban, Atroban) and tetrachlorvinphos (Rabon) dusts are also registered.

Although dusts are available and registered for use on dairy cattle, some milk-marketing organizations object to their use. Check with your local fieldmen before using them. Dusts applied directly to cattle have been effective only on horn flies.

Cattle can be self-treated as they enter or leave the barn, hand sprayed, or the barn can be mist- or fog-treated while the cattle are inside. Do not individually treat cattle and mist/fog barn at the same time. Follow directions on the container exactly. Observe all safety precautions. If face flies are a problem, give special attention to spraying head and shoulders.

Back rubbers are an effective way to treat cattle not regularly coming into the barn. Use only those products approved for backrubber use on dairy cattle, such as permethrin or coumaphos (CO-RAL). Follow mixing directions on the label.

DO NOT MAKE YOUR OWN COMBINATION PRODUCTS BY MIXING INSECTICIDES.

Milkhouse and Egg Handling Room

Hand spray or fog with dichlorvos (Vapona) or pyrethrins when necessary. Use the same dosage listed for dairy cattle. Do not contaminate food handling utensils. The dichlorvos (Vapona) strip can be used. But do not use it in kitchens or in food handling and processing establishments where there is exposed food. Sticky fly strips or papers can also be used where appropriate.

Electronic ultrasonic repellers are supposed to "drive away" pests and not harm the good animals. These devices simply don't work.

Electrocutors and light traps will kill insects when employed properly. Some are designed to intercept night-flying insects entering a food plant that are attracted to light. Others are designed to monitor insect populations. This is far different than trying to control insects, such as flies, which are not hightly attracted to light. There is no question that some flies will be electrocuted when they contact the exposed wires, but the number killed is a very low percentage of flies in the area. So for practical purposes, electrocutors and light traps are of no value.

Buying and releasing beneficial, parasitic or predator insects is an excellent way to control pests, but this technique works only in a very limited number of situations, and managing this process is a highly complex operation. The U.S.D.A. studied fly populations on feedlots and dairies. Researchers reported no differences in adult populations of flies on those farms releasing parasites when compared to the other farms.

Livestock Barns

Diazinon (WP), dimethoate, fenthion (Baytex), malathion, naled (Dibrom) permethrin (Ectiban, Atroban) and tetrachlorvinphos (Rabon) can be used in livestock housing.

As a routine precaution, remove all livestock from the building being sprayed. Spray the walls and ceilings with insecticide. Repeat when flies no longer drop from the surface because insecticide has lost its toxicity. Insecticides are generally non-toxic or useless if applied to a concrete or brick surface—improved performance is obtained by painting or whitewashing before spraying. Some insecticides can be mixed and applied with whitewash. Do not spray exposed Styrofoam insulation with the insecticide mixture.

Feed Additives to Control Flies

Several products are approved for use as a feed or mineral additive or in a bolus to control flies. They are diflubenzuron, phenothiazine, methroprene (Altosid) and tetrachlorvinphos (Rabon). These chemicals pass through the digestive tract without harm to the animal and leave no illegal residues in the meat and/or milk when mixed and fed according to manufacturer's directions. Enough insecticide remains in the manure to kill or prevent flies from completing their development.

Tetrachlorvinphos (Rabon) is registered for use in dairy as well as beef animals, while phenothiazene is approved only for beef animals.

The insecticide must be mixed with either the feed concentrate or mineral mixture. The animal must consume a specific amount of feed-insecticide or mineral-insecticide mixture daily. For example, tetrachlorvinphos is registered to be fed at 70 milligrams per 100 lbs. of body weight per day. You need to know the weight of the animal being fed and the amount of feed consumed each day by this animal. Based on this information your feed dealer and/or chemical supplier can determine the quantity of stirofos to be mixed into your feed.

Bolus

To control developing flies (maggots) in manure, uniform quantities of insecticide must be present at all times. A bolus containing diflubenzuron (Vigilante), when placed in the animal's stomach, will constantly release insecticide all season, at concentrations adequate to kill developing flies. The bolus can be administered with a standard balling gun. Small animals require 1/2 bolus; medium animals, 1 bolus; and large animals, 1 1/2 boluses. This product is approved for beef as well as dairy animals.

Ear Tags

Insecticide-impregnated ear tags have been approved for use on dairy and beef animals. Be sure tags are attached correctly. They are very effective in controlling horn flies, only moderately effective in reducing numbers of face flies, and are much less effective against house and stable flies.

Beef Cattle

Primary pests on beef cattle are horn, face, deer and horse flies; and mosquitoes. Currently there is no practical control for deer and horse flies or mosquitoes. Face flies are also difficult to control. However, the horn fly is easy to control, and the farmer has a choice of insecticides. Use the proper dosage; follow all safety precautions; and if cattle are to be sold for slaughter, observe the proper withdrawal periods. These products can be applied by spray, backrubber or self-treating dust bags.

Other Animals

While flies generally do not bother hogs, chickens, and rabbits, and horses and dogs are not involved in human food production, fly control is still important. Flies are considered a public health nuisance and health authorities can force you to take action.

If you are involved with these animals, recognize your responsibilities. Decaying organic matter such as manure, unconsumed food, spilled food, or wet bedding can help produce large quantities of flies. Do not rely on insecticides. **Sanitation can replace insecticides, but insecticides will not replace sanitation.** Generally the most practical solution is a compromise.

When using insecticides near and around animals:

a. Read and follow label directions exactly.

b. Do not apply any insecticide directly on an animal unless the label specifically states the animal can be safely treated.

c. When using any insecticide near the animals, be aware of the animals' normal or natural behavior. Horses can be frightened by a spray; cats, by their normal grooming, might ingest chemicals applied to their fur; and birds might pick up fly or roach bait, or they may try to alight on a suspended dichlorvos (Vapona) strip.

Recent Changes

Under current federal regulations, insecticides are not permanently registered. The Environmental Protection Agency reviews the current research data base, and if it is incomplete, the EPA can require the manufacturer to provide additional data to support the registration claims. If there is evidence that the insecticide causes an unreasonable adverse effect on the applicator, animal, food product or environment, the EPA can require modified directions on the label.

The manufacturer has several options: 1) provide the required data to support registration; 2) withdraw certain uses; or 3) withdraw the registration and stop making and selling the product.

Unless there are questions of safety and/or serious illegal residues, existing supplies of the product may be used.

Several popular insecticides are now being phased out or having uses withdrawn because the manufacturers believe the cost of supplying the data won't be recovered from product sales. You may find that your favorite product is no longer available, or that you may no longer use it to control a specific pest.

Therefore, it's important to 1) buy only reasonable quantities of any insecticide at one time, and 2) deal with responsible suppliers handling only currently registered products.

Resistance

In some parts of the United States, flies have developed a high degree of resistance to the pyrethroid insecticides such as cyfluthrin, cypermethrin, cyhalothrin, fenvalerate and permethrin. If you have fly-control failures with pyrethroid insecticides, consider using phosphate products (a different class) such as coumaphos, diazinon, dichlorvos or tetrachlorvinphos.

Buying an Insecticide

Consult a knowledgeable person when buying insecticides—mistakes can be costly. When in doubt, contact the State Department of Agriculture, Trade and Consumer Protection. It is responsible for administering and enforcing Wisconsin insecticide laws.

See publication A1991, Controlling Mosquitoes for recommendations for mosquito control; and publication A1235, Spider Control in Homes and Barns, for spider control.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture andWisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and provides equal opportunities in employment and programming including Title IX requirements.

W.L. Gojmerac is professor of entomology, College of Agricultural and Life Sciences, University of Wisconsin–Madison and University of Wisconsin–Extension, Cooperative Extension. We extend appreciation to O.L. Lovett and Wisconsin State Department of Agriculture, Trade and Consumer Protection for the illustrations and descriptions of flies.

Produced by Extension Publications, University of Wisconsin–Madison.

This publication is available from your Wisconsin county Extension office or from:

Extension Publications, Rm. 245
30 N. Murray St.
Madison, Wisconsin 53715
Phone 608-262-3346

Editors, before publicizing, contact Agricultural Bulletin to determine availability.

A2118 Identifying and Controlling Flies: On dairy, beef, other livestock and pets **R-08-91-1M-45-E**