

ERADICATION OF EXTERNAL PARASITES

External parasites live on the skin of animals or visit them to feed. Most of these parasites can be seen with the eye alone, although for mites you need to look through a microscope.

THERE ARE SIX COMMON TYPES OF ARTHROPODS AFFECTING LIVESTOCK.

1. Flies- most suck blood, deposit eggs in necrotic dead or dying tissue, cause annoyance and live where there is filth and waste matter.
2. Mosquitoes- they suck blood and transmit disease and are especially prevalent in areas where water is allowed to accumulate.
3. Ticks- they suck blood, carry disease, lay eggs in the hair of the animal and transmit parasites
4. Fleas- they suck blood, transmit disease and parasites and live in hair and bedding.
5. Lice- they are a small flat wingless insect, which scratching and eventually resulting in a general decline in overall health and appearance
6. Mites- they are very small insects that produce mange so eventually the skin becomes rough and wrinkled.

WHY ARE EXTERNAL PARASITES IMPORTANT?

1. Some are just a nuisance to the animals.
2. Some cause skin and eye irritation and damage, which can lead to bacterial infection and fly maggot attack.
3. Some create large wounds.
4. Others suck blood, causing the animals to become weak.
5. Some can spread diseases between animals.
6. Some can cause disease through poisonous bites (toxins).
7. All of these leads decreased production and even death.

ECTOPARASITES ARE RESPONSIBLE FOR ECONOMIC LOSSES TO CATTLE AND SHEEP PRODUCERS.

1-DIRECT LOSSES

1. Direct losses are a result of discomfort and damage caused by the parasites. Discomfort results in drops in milk production and retarded growth rates.
2. Ticks, blowflies, sheep keds and mites cause direct damage to hides and wool or damage resulting from rubbing and scratching due to pruritis.

2-INDIRECT LOSSES

Indirect losses are due to diseases transmitted by ectoparasites.

1. Tick borne diseases - Babesiosis, Anaplasmosis, Dermatophilosis, Theileriosis and Heart Water.
2. Flies - transmit mastitis and keratoconjunctivitis, Trypanosomiasis and other diseases
3. Midges - transmit Bluetongue, African Horse Sickness and other diseases

WHAT IS THE ECONOMIC IMPACT?

1. Losses can occur from these parasites due to irritation, blood loss, depressed appetite, and decreased rate of gain.
2. Mange can affect the mammary gland and interfere with milking.
3. Lactating animals will lose production depending on the level of infestation.

CONTRIBUTING FACTORS FOR EXTERNAL PARASITES

1. Intensive grazing in woodland areas (ticks)
2. Close confinement
3. hot weather conditions
4. Anything that puts cattle in frequent contact with other cattle
5. Overcrowding and poor hygiene
6. excessive humidity and darkness

CLINICAL SIGNS

1. Rough hair coat Lack of appetite, poor rate of gain
2. Depression, lethargy and off-feed.
3. Constant rubbing against fences or equipment.

GENERAL MEASURES FOR PREVENTION AND CONTROL OF EXTERNAL PARASITES

1. Hygienic animal accommodation should be constructed that it can be always kept clean
2. Frequent disposal of manure heaps, old rubbish and vegetations which attracts insects
3. Efficient animal management (grooming, clipping, washing)
4. Periodical spraying or dipping of animals with insecticides
5. Cracks and cervices inside stable should be sealed and closed
6. Pasture rotation.

4) CONTROL OF FLIES

- Flies belong to the order Diptera, a large, complex order of insects.

Biting and Nuisance Flies

- Biting
 - Mosquitoes
 - Black flies
 - Horse flies
 - Deer flies
 - Stable flies
 - Photo credit: Bastiaan (Bart) Drees
- Nuisance
 - House flies
 - Face flies
 - Bottle flies



ACT - Ectoparasite Id and Lifecycles

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Figure 1.
Face Fly



Figure 2.
Stable Fly

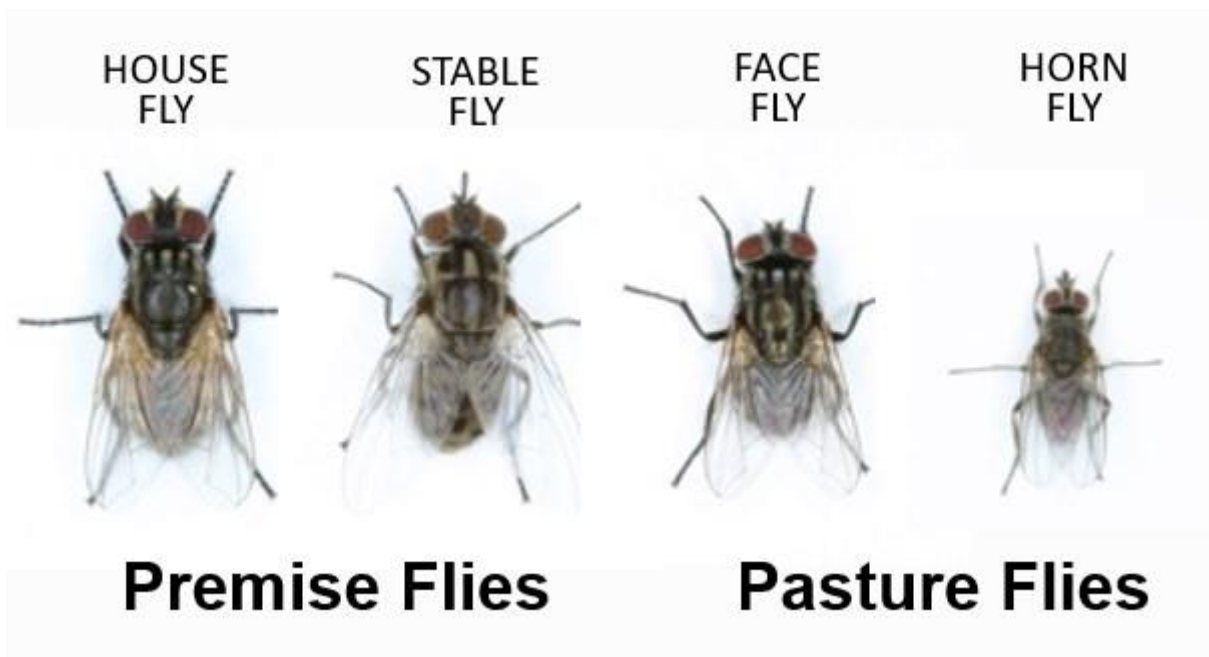


Figure 3.
House Fly



Figure 4.
Horn Fly





FLIES CAN BE DIVIDED INTO:

1. FLIES WITH BITING MOUTHPARTS

- Only the females feed on vertebrate blood, which is required for egg laying e.g. black flies, sand flies, biting midges, mosquitoes, horse flies, and deer flies.
- Both male and female flies feed on vertebrate blood e.g. stable flies, horn flies, buffalo flies, tsetse flies, sheep keds, and hippoboscids or louse flies.

2. FLIES WITH NON-BITING MOUTHPARTS/NUISANCE FLIES

- **FACE FLIES, HEAD FLIES, FILTH-BREEDING FLIES AND EYE GNATS.**
- Flies where larval stages result in damage – Myiasis, Screw-worm, warble flies, flesh flies, blow flies and sheep nasal bot.
- Non-biting flies may feed on the secretions from the eyes, nose and any small wounds.
- This distracts animals from grazing, causing a reduction in growth and productivity. Non-biting flies are not key vectors of any specific disease organisms, but because of their feeding and reproduction habits, and the structure of their feet and mouthparts, they can act as mechanical vectors for a whole range of pathogens, from viruses to helminthes.
- Biting flies can cause even greater irritation to domestic animals, and they too are vectors for bacteria, viruses, spirochetes and chlamydiae etc. However, because they feed on blood, they can also cause anemia and hypersensitivity.

- As larvae, flies may develop in the subcutaneous tissues of the skin, respiratory passages, or GI tract of vertebrate hosts and produce a condition known as myiasis.
- The growth and performance of nearly all farmed animals are adversely affected by flies, especially when they are present in high numbers. Infested animals become harassed and feed intake is drastically reduced. The result: significant reductions of meat and milk production and serious economic losses

FLIES	DISEASES TRANSMITTED/VECTOR OF
Sand fly	Leishmania spp.
Biting midges	Blue tongue virus and Onchocerca cervicalis
Mosquitoes	Equine encephalomyelitis, Japanese B encephalitis, Rift valley fever, African horse sickness
Horse fly	Equine infectious anemia, African horse sickness, Anthrax, Trypanosoma evansi, T. vivax and Bovine leukosis virus
Stable fly	Anthrax, Surra, Equine infectious anemia, Lumpy skin diseases and Anaplasmosis
Tse tse fly	Trypanosoma brucei
Face fly	Moraxella bovis, Thelazia spp. and parafilaria bovicola

- There are many insecticide control methods available backrubbers, dust bags, insecticidal ear tags and strips, pour-ons, oral larvicides, low pressure sprayers, mist blower sprayers, and the Vet Gun™.
1. **BACKRUBBERS AND DUST BAGS** are an effective way to reduce horn fly numbers if cattle are forced to use them.
 2. **INSECTICIDE EAR TAGS AND STRIPS** are a convenient method of horn fly control. However, many horn fly populations in Nebraska exhibit a degree resistance to the pyrethroid class of insecticides. The recommended management practice to maintain horn fly control is to rotate insecticide classes.
 3. **ANIMAL SPRAYS AND POUR-ON PRODUCTS** will provide 7-21 days of control and will need to be re-applied throughout the fly season.
 4. **ORAL LARVICIDES PREVENT** fly larvae from developing into adults. An important factor when using an oral larvicide is insuring steady consumption. An additional complicating issue using an oral larvicide is horn fly migration from neighboring untreated herds which can mask the effectiveness of an oral larvicide.

CONTROL METHODS OF STABLE FLIES

1. The only adult management option available for the control of stable flies on range cattle is use of animal sprays.
2. Sprays can be applied using a low pressure sprayer or can be applied with a mist blower sprayer. Weekly applications of these products will be required to achieve reduction in fly numbers.
3. Sanitation or clean-up of wasted feed at winter feeding sites may reduce localized fly development. If sanitation is not possible these sites may be treated with a larvicide (Neporex®).
4. But, the application of either procedure may not totally reduce the economic impact of stable fly feeding.

INFESTATIONS OF FLY MAGGOTS (MYIASIS)

- Myiasis is the presence of fly larvae in the living tissue of the host. Several kinds of maggots infest the wounds of warm-blooded animals. However, the only one that feeds exclusively on live flesh is the primary screwworm.
- Sterile male releases have eradicated the primary screwworm fly from the Southeast but there is constant danger of re-infestation.
- Other species, such as the secondary screwworm and other blow flies, may also infest wounds. These species normally lay their eggs on carcasses of dead animals and may occasionally occur in the dead tissue of open wounds. Although these species may cause some damage, they will not consume living flesh and will feed only on dead flesh and wound secretions. However, they may cause some tissue to die and then will feed on this dead tissue.

TREATMENT OF FLY STRIKE

1. Clip and clean coat around the area affected, remove maggots and treat with insecticidal cream, powder or spray.
2. The animals may need treatment with antibiotics

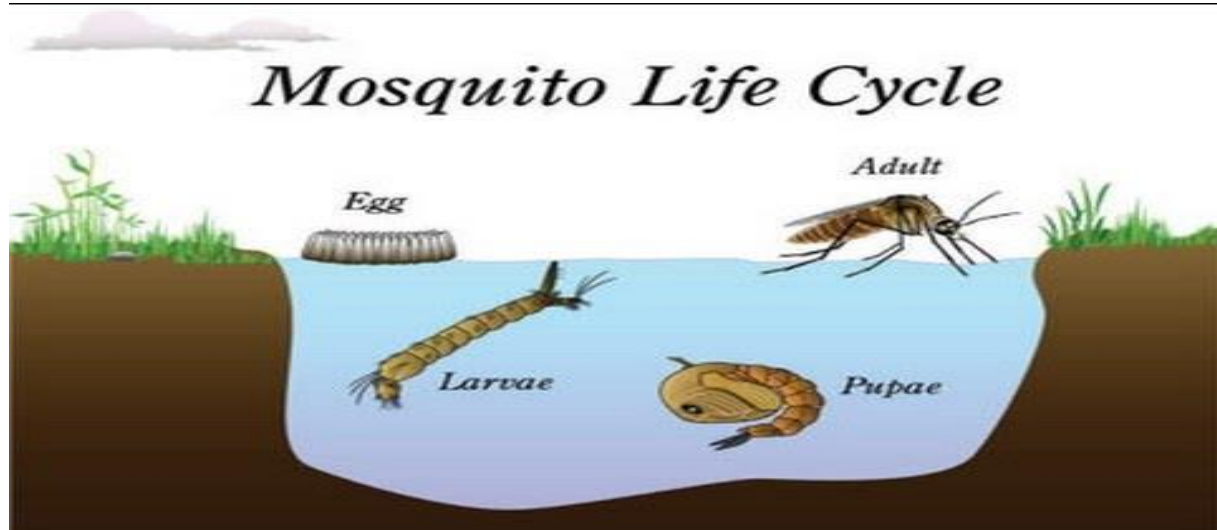
C) CONTROL OF MOSQUITOES:

1. Are small insects with piercing-sucking mouthparts, and scales on their wings. Their attacks can cause loss of weight and decreased milk production.
2. The mosquito life cycle consists of 4 stages. The eggs are laid either directly on the water surface or on damp soil and sides of containers that will be flooded later. Common breeding sites for mosquitoes are drainage ditches, ponds, tin cans, old tires and tree holes. The eggs of most species hatch in 2 to 3 days, and the larvae or "wigglers" feed in the water on organic matter.
3. The larvae pass through 4 stages in about 7 to 10 days. The pupal stage lasts 2 to 3 days, and the adult emerges from the pupa skin at the water surface.

4. The most effective control method available is source reduction by removing or draining mosquito breeding sites. Daily fogging or aero soling for adult mosquitoes may provide relief but only as temporary control measure.

LIFE CYCLE

- The mosquito goes through four separate and distinct stages of its life cycle: Egg, Larva, Pupa, and Adult. Each of these stages can be easily recognized by its special appearance. ... Most eggs hatch into larvae within 48 hours; others might withstand subzero winters before hatching.



WHAT IS THE PURPOSE OF STUDYING THE LIFE CYCLE OF MOSQUITO?

- Everything science tells us about the life cycle and lifespan of a mosquito can directly help us target and reduce mosquito populations in communities before they can spread deadly viruses like Zika, dengue, and malaria

HOW LONG IS A MOSQUITO LIFE CYCLE?

- Mosquitoes can live and reproduce inside and outside the home. The entire life cycle, from an egg to an adult, takes approximately 8-10 days. Pupae develop into adult flying mosquitoes in 2-3 days. Female mosquitoes lay eggs inside containers holding water

HOW LONG DO MOSQUITOES LIVE AFTER THEY BITE YOU?

- three weeks
- Only female mosquitoes bite and feed on the blood of humans or warm-blooded animals. If a mosquito finds enough victims to bite and avoids being squashed, it can live as long as three weeks. During that time, it may lay up to five clutches of more than 100 eggs each

WHAT SMELLS DO MOSQUITOES HATE?

- **Oranges, lemons, lavender, basil and catnip** naturally produce oils that repel mosquitoes and are generally pleasant to the nose – unless you're of the feline persuasion. ...
- **Their bitter citrusy smell is one** that mosquitoes tend to avoid unless they're really hungry

HOW DO YOU CONTROL MOSQUITOES?

1. Reduce the number of breeding sites on your property. ...
2. Kill mosquito larvae where the insects breed. ...
3. Remove algae from ponds. ...
4. Use a mosquito repellent in your outdoor living space. ...
5. Exclude mosquitoes from your home. ...
6. Increase the number of mosquito predators in your yard

HOW DO YOU STOP MOSQUITOES FROM BREEDING?

1. Don't let water go stagnant. Mosquitoes need stagnant, still water to lay their eggs and for the young to successfully hatch and mature. ...
2. Pick up your litter. ...
3. Pay attention to your water features. ...
4. Drain or throw out tires. ...

WHAT PREVENTS MOSQUITO BITES WHEN SLEEPING?

- Use essential oils: Use a mix of lavender, neem, citronella, and catnip oils on your skin to keep mosquitoes away in the night.
- You can "Place a piece of camphor" in a bowl near your bed.
- Use a mosquito coil to repel mosquitoes in the night, one coil can last about 8 hours and can give you sound sleep for a night

WHY DO MOSQUITOES BITE ME AND NOT MY HUSBAND?

- Mosquitoes will bite some people more than others (such as your husband, child or friend), because of genetics. Your DNA will determine whether or not you are more likely to excrete skin substances that are attractive to female mosquitoes. It is only the female variety of mosquitoes that will bite to gather blood

CONTROL OF FLIES

1. Practice good stable and koraal hygiene (clean regularly)
2. Remove manure to large bins to restrict fly breeding and to make compost
3. Drain damp areas to stop breeding of mosquitoes and biting midges
4. Use dips; sprays and treats wounds to prevent fly and strike problems
5. Immediately treat skin wounds so that strikes do not occur.

OPTIONS FOR CONTROLLING FLIES

A. CHEMICAL POUR-ONS

- Several pour-on products applied to the backs of animals are available, based on synthetic pyrethroids such as permethrin and deltamethrin.
- In an average summer, three or four treatments are usually required.

1-EAR TAGS CONTAINING CYPERMETHRIN ARE ALSO AVAILABLE.

EFFECTIVENESS

- Very effective – most will kill flies on contact.

Pros	Cons
➤ Ease of use ➤ Most have zero milk withdrawal requirements and can be used during pregnancy and lactation ➤ Effective against all the major fly pests	➤ Provide little protection to the udder area ➤ Potential issues with resistance ➤ Use of synthetic compounds may come under pressure in future

2-CHEMICAL SPRAYS

An insecticide is applied as a water emulsion via a knapsack sprayer or spray arch.

EFFECTIVENESS

Very effective but there is risk of insecticide washing off during heavy rain.

PROS	CONS
➤ Insecticide can be applied to specific parts of the animals, such as the udder area, during periods when animals are high risk from disease	➤ Good handling facilities are essential ➤ Applications are weather-dependent ➤ High labour requirement – fortnightly

- applications are usually needed
- Difficult to apply spray evenly

3-BIOLOGICAL

- Fly parasites are introduced on to farms by trained veterinary technicians to inhibit the breeding population of nuisance flies. The parasites actively search for nuisance fly eggs.
- Female parasites pierce the nuisance fly pupae to lay their eggs. The parasite larvae hatch and eat the contents of the nuisance fly pupae before progressing to parasitise more nuisance fly larvae themselves. This helps to control the nuisance and biting fly populations at source.

EFFECTIVENESS

- This method is effective in intensive housed systems, calf sheds and parlours.
- Parasitic flies can be killed in cold weather, so the programme should be carried out annually. Over time there should be a reduction in overall fly population, leading to reduced quantity of parasites required.

PROS	CONS
➤ A sustainable approach to fly control ➤ Fly population is naturally reduced over time ➤ Used as part of a wider fly control strategy, it reduces use of synthetic products	➤ Fly parasites should be distributed every two weeks to help build up a population of fly parasites ➤ Not as effective in extensive grazing systems where cows are at grass for longer periods

WALK-THROUGH FLY TRAPS

- They are relatively uncommon in the UK, but are widely used on cattle farms in the USA.
- Cattle walk through a structure with walls and a roof: the wall contains traps and flies are collected directly from cattle as they pass through the funnel (using dark-coloured brushes to force the flies towards the light of the roof) and they become trapped inside a false ceiling within the structure.
- Other options include a vacuum method that blows air to dislodge flies from animals as they walk through the structure and flies are then sucked into the machine.

EFFECTIVENESS

Repeated use of a mechanical trap can reduce the overall local population of horn flies.

PROS	CONS
➤ A non-chemical method of control	➤ Cattle must be “forced” to pass through walk-through fly trap regularly, so it may be effective only where cattle are being handled regularly

Cost

Fly Control



APPLICATION OF INSECTICIDES:

1. Various methods including dipping, spraying, ear tagging or pour on, have been used to apply chemicals to protect livestock against ticks.
2. Direct application of acaricides to animals is the most popular method of controlling ticks on livestock.

3. Applications of acaricide to tick-infested cattle via dipping or sprayer can be equally effective under ideal conditions with proper handling of equipments without injuring animals and subsequent dilution of a product

CATTLE DIPS: Dipping or spraying with an acaricide is the most efficient way of reducing the number of ticks.

SITTING A DIP

1. The ground where a dip is to be built and the area around should be slightly sloping and as hard as possible. Soil is ideal: The ground must: support the structure of the dip; be well drained and not muddy in wet weather.
2. Cattle must not be hot or thirsty when they are dipped, so it is important to have a water trough inside the collecting yard.

CATTLE SPRAY RACE

1. A spray race site requires the same features as a dip site and these have already been described; the only difference is that the dip tank has been changed for a spray race.
2. The race consists of an approximately 6 m long and 1m wide tunnel with masonry side walls and a concrete floor.
3. A spray pipe system on a length of 3 to 3.5m in the tunnel having 25 to 30 nozzles place in the walls, ceiling and floor, discharge dip liquid at high pressure and expose the cattle passing through to a dense spray.. Spraying is quicker than dipping and causes fewer disturbances to the animals. However, spray may not efficiently reach all parts of the body or penetrate a fur of long hair.
4. Hand spraying is an alternative method that can work well if carried out by an experienced person on an animal properly secured in a crush. The method is time consuming and therefore only practicable for small herds where there is no communal dip tank or spray race. Sprays made directly on the animals; Control is short-lived

CONTROL

1. Use the correct insecticide and follow the manufacturer's directions.
2. Birds may be sprayed, dusted or dipped, depending on the size of the flock. Dusting is more convenient if there are only a few birds in the flock. Whatever method is used, ensure that the bird is completely covered with insecticide
3. The vent (anus) and under wings are often missed; these are favorite areas for parasites.

4. The roof and walls of the shed should be treated, as well as perches, nesting boxes and litter. Make sure that all cracks and crevices are well penetrated with insecticide.
5. As insecticides have no effect on parasite eggs, follow-up treatments are required.

Fig (12) Insecticide Spraying

Fig (13) Dipping vat

