



## Common Ectoparasites of Livestock and their Management

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### Introduction

Dipteran species (two-winged insects, or true flies) are well known for its consequences when they bite host to have blood meal, also known as hematophagous, cause nuisance to the animals during the adult stage, and myiasis at the immature stages or larvae by feeding on the living soft tissue and act as a vector either mechanically or cyclically transmitting innumerable deadly pathogens which result in production losses and some are even prone to human death.

Common ectoparasites which affect cattle health and in turn cause drastic reduction in production level causing havoc in economic downfall of the country.

**Lice:** Lice are relatively small and mainly are of 2 types: sucking and biting lice. Sucking lice are blood feeders whereas biting lice feed on skin and hair of which the main sucking lice of cattle are: *Haematopinus eurysternus*, or short-nosed cattle louse; *Haematopinus quadripertusus*, or cattle tail louse; *Linognathus vituli*, or long-nosed cattle louse; and *Solenopotes capillatus*, or little blue cattle louse. More common during the winter months with peak populations found in February/March but cattle tail louse is more abundant in the summer. Dairy cattle which remain in stall barns are more likely to be infected than those who remain in the free stalls. Calves that are housed indoors can be affected throughout the year with peaks in the summer months. Lice complete all the stages of their life cycle on the host. Heavy lice infestation creates irritation, lack of appetite, lethargy, extreme pruritus, severe anemia, affected animals scratch and rub the skin constantly against any hard objects in order to get relieved from the irritation. To control lice infestation, one must follow a high plane of nutrition to ensure healthy animal who are more resistance to lice and rarely carry heavy loads, applying a thin coat of vegetable oil such as raw linseed oil which interfere with the insect respiration creating suffocation and undiluted soap



solution, pyrethroid pour-on insecticides are effective against all types of lice, whereas the ivermectin's, moxidectin and eprinomectin mainly kill sucking lice.

**Advice:** Never put kerosene, diesel or other petroleum-based products, Treatment should be done in winters so as to keep the animals safe during spring and summer

**Mites:** Cattle are mostly affected by 5 types of mange according to the species causing it. Sarcoptic mange, or scabies, caused by *Sarcoptes scabiei var. bovis*, a highly contagious skin burrowing mite, causes intense pruritus, papule formation, thickening of skin, fold formation, and the entire body can be affected which highly degrades the hide and skin reducing economic value of the leather industry. *Psoroptes ovis* is a non-burrowing mite causing psoroptic mange that pierces the skin and draw the fluids which are coming out of the wound and form a thick crust. Exudative dermatitis, alopecia (hair loss), and intense pruritus are the characteristic of psoroptic mange that can even kill the untreated calves. *Chorioptes bovis*, another mite, typically resides the skin surface of the tail and lower legs *Demodex bovis* is the most common and dangerous mite, mostly found during late winter and early spring that usually infest the hair follicles and sebaceous glands to feed on sebum, oozing plasma, and epidermal debris. Young cattle are more susceptible to mange infestations. Long standing condition leads to secondary bacterial infection resulting in defects of raw leather and losses to the tanning industry. Cattle are also susceptible to infestation by the ear mites *Raillietia auris* and *Raillietia flechtmanni* which causes accumulation of wax and the involvement of neurologic symptoms. Early detection and diagnosis using the proper microscopic examination of skin scrapings as well as blood test is important for the control of infestations. Treatment with Ivermectin, Doramectin, Eprinomectin, and Moxidectin are useful. Lime-sulphur dip for mange one every 7-10 days – 6 course is helpful. Apply essential oils -1 part with 2-3 parts vegetable oil rubbed in well; e.g., camphor, eucalyptus, pine, rosemary etc., insecticide dust bags or backubbers which allow animals to self- treat.

## Flies

**Horn Fly:** *Haematobia irritans* or horn fly (as they are mainly found in horns) is a ectoparasite which are very common in areas where land is available for cattle grazing. Adult tick are mostly found on the host specially on the the back and shoulders of cattle or on underbelly during the hottest part of the day. They are continuous blood feeder which not only causes nuisance and irritation but also affects the health of the animal like anaemia, decreased appetite, and huge reduction in milk production. Larvae generally are found in cow dung. Treatment is difficult if there is huge presence of adult flies. Horn flies also transmit bacteria causing bovine mastitis mechanically causes bleeding sores from stephanofilariasis in cattle. Cattle should be given-feed additives which contains larvacides and insect growth regulators so when they excreted in the dung prevents the adult stage to grow and this



control *Haematobia* spp. populations.

**Stable fly:** biologically known as *Stomoxys calcitrans*, is an ectoparasite which is very commonly found in the stable (where the horse stays). Both the male and female suck blood mainly from the lower parts of the body through a painful bite, Larvae mainly live / breed on cow dungs, animal bedding. Stable flies tend to blood feed on the lower parts of cattle. They are responsible for transmission of *trypanosomas*, *anthrax*, *rinderpest* (mechanically) which is very common in the summer season. Many viruses, bacteria, and protozoans are also transmitted by stable fly. Control can be done by regular removal of manure, proper sanitation in and around cattle-house, spraying insecticides to walls, ceilings.

**Horse flies:** Generically known as *Tabanus*. Only the females are blood suckers whose bites are very painful and suck about 0.2- 0.3 ml / day resulting in anaemia. About 17% reduction in feed conversion efficiency has been recorded. Gadding of the animal is hugely degraded. Tabanids are efficient mechanical vectors of pathogens like *Trypanosoma evansi*, *Anaplasma marginale*, *Pasteurella tularensis*. It is difficult to control because they can fly far away from their breeding areas. Still traps and residual sprays of malathion can be useful for tabanid control. Ear tags with cypermethrin is effective. Kerosene on water which blocks the respiratory system of larva is very useful.

**Myiasis-causing flies:** Myiasis is a condition also referred as maggots, which feed on living or necrotic tissue of a live animal to develop and complete their life cycle. Families Muscidae, Oestridae, Calliphoridae (blow flies) and Sarcophagidae (flesh flies) are some of the most damaging flies of cattle. Females do not bite but when they get the opportunity such as open wounds, they lay their eggs from which the maggots emerge. After burrowing into the skin, larvae develop and migrate to superficial tissue, where the warble is formed which diminishes the value of hides. They are also a nuisance and can induce cattle to injure themselves. Economically important fly species in the family Oestridae causing myiasis in cattle include *Hypoderma lineatum*, also known as the common cattle grub, *Hypoderma bovis* or the northern cattle grub. Anxious behavior by cattle to avoid female grubs to deposit their eggs known as gadding, is generally observed in *H. bovis* infection. This results in reduced weight gains, lowered weaning weights, and reduced milk production in addition to tissue damage, from infested cattle. Macrocyclic lactones can be used to control cattle grubs by treating in autumn and spring. However, treatment must be avoided when *H. lineatum* and *H. bovis* grubs cluster along the esophagus and the spinal column, otherwise components from dead grubs can be leaked which can trigger respiratory distress, paralysis, and shock in treated cattle.

**Mosquitoes:** The adult females mainly feed on blood. Mosquito larvae develop in many water bodies like ditches, ponds, open containers, pits, tyres which can hold water. This causes irritation which decreases feed intake and ultimately causes reduced milk production. Mosquito mostly bites at night but



some species also feed during the day. Mosquitoes transmit huge number of diseases, some of which are even causing in human. *Anopheles* transmit malaria in human, *Setaria digitata* in cattle, *Culex* and *Aedes* are responsible for human filariasis i.e., *Wucheria bancrofti*, *Brugia malayi*, *Aedes* mosquito is responsible for dengue fever. Thus, control or management is very essential to prevent this type of deadly diseases. All the standing water should be eliminated to control mosquitoes breeding areas. Fishes like *Gambusia*, *Guppies* can be introduced into water bodies which chiefly feed on mosquito larva, any open pits to be covered with sand, spraying copper acetoarsenite with kerosene is very useful. In animal sheds malathion can be sprayed.

**Ticks:** Ticks are obligate blood-feeding arachnids and are the most important parasitic arthropod group which act as a potential vector for almost all-important animal diseases of domestic animals and wildlife. Ticks transmit wide variety of pathogenic microorganisms including protozoans (babesiosis, theileriosis), rickettsiae (anaplasmosis, ehrlichiosis, typhus), viruses (e.g., Kyasanur Forest Disease) bacteria (e.g., *Pasteurella*, *Brucella*, *Listeria*, *Staphylococcus*) and spirochaetes. Bovine babesiosis, anaplasmosis, theileriosis, and heartwater are some of the important diseases listed by the World Organization for Animal Health caused by tick in cattle (OIE, 2019). The importance of ticks in animal husbandry is that it is very difficult to control and eradicate ticks and tick-borne diseases. *Rhipicephalus microplus* is considered as the most economically important ectoparasite of livestock worldwide which transmit *Babesia bovis* and *B. bigemina*, causing babesiosis in cattle. This bovine babesiosis or red water disease ranks at the top of arthropod-borne diseases causing huge financial losses for cattle producers. Due to the intense use of ectoparasiticide against it, *R. microplus* ranks sixth among the most resistant arthropods globally. Comparatively *T. annulata* and *A. marginale* infections are less though prevailing in the state due to low prevalence of vector i.e., *Hyalomma anatolicum anatolicum*.

## Management

- Periodic application of acaricide on the animal as well as cracks and crevices of the cattle shed is quite effective.
- Exposure to sunlight - keep animals outdoors as much as possible
- Heaps of dung cakes and stacks of bricks may also provide breeding places to the ticks in animal sheds and therefore should be removed periodically.
- Cattle and buffaloes should be housed separately.
- Newly purchased animals should be quarantined for at least a month and if any tick found should be subjected to treatment.
- Rotational grazing has been found to be successful in reducing tick population of livestock.



## References

World Animal Health Organization. OIE-Listed diseases. In: OIE-Listed diseases, infections and infestations in force in 2019. 2019. Available at: <https://www.oie.int/en/animal-health-in-the-world/oie-listed-diseases-2019/>. Accessed November 29, 2019.

