

Deer Fawn Myiasis (aka: Flystrike, Flyblown)

By: Beth Knapp-Tyner, Wild at Heart Wildlife Rehabilitation

In the summer of 2009, many areas of NC experienced higher levels of precipitation than normal. High humidity and warm summer temperatures set the stage for perfect breeding conditions for the Green bottle fly (*Lucilia sericata*) on neonate White-tailed deer fawns. Fawns suffered higher than normal incidences of myiasis/flystrike (maggot infestation) than is typically seen in rehab admissions. In a survey of fawn rehabbers, 50% of fawn intakes presented with myiasis in high humidity areas in 2009 (includes reports from all states). The adult female flies lay their eggs (130-200 at a time) on warm damp areas of the young fawns, eggs may hatch in as soon as eight (8) hours after being deposited if conditions are optimal, or take up to 24 hours in less than optimal environmental temperatures. Because neonate fawns lie still instinctively the first two weeks of life and grooming by their mother can cause damp hair around tail/rump area, they lend themselves to be a perfect host for depositing of fly eggs and myiasis.

Excretions from the newly hatched maggots inflame and irritate the fawn's skin. Enzymes in the excrement of larvae and maceration cause the breakdown and liquefaction of the animal tissues. The fly larvae macerate tissue by using: "strong hooks which are articulated and lie outside the mouth, the powerful structure of the head armature and the size of the attached muscles; there are no teeth inside the mouth.



Weismann regarded the head armature solely as an organ of locomotion, for crawling and boring through the food; however, its main function may be to macerate the food, for which it is clearly well adapted." (1) The larvae then ingest the liquefied "food" and tunnel deeper into tissues. Maggot infested wounds (primary or secondary) are found to have a high ammonia content and it is thought to come from maggot secretions, it is likely that this enhances and increases the devitalization of healthy tissue.

High maggot loads in livestock are associated with high serum ammonia levels, altered consciousness, and death. High levels of serum ammonia cause metabolic acidosis. Myiasis wounds can be so extensive that they are similar to 3rd degree burns. Shock, endotoxemia, & acidosis are often present in fawns with extensive myiasis/tissue damage. These animals have a very poor prognosis and euthanasia is the most humane course.

The most common sites of myiasis reported in survey of fawn rehabilitators were: (descending order) rump/hip, rectal/vaginal, tail, interdigital & tarsal glands, metatarsal gland, teats, umbilicus, chest/back, pre-orbital gland. (4)

Treatment of fawns presenting with myiasis; Quickly assess for extensiveness of myiasis and level of tissue damage, sometimes this will not be wholly evident until initial removal of surface maggots is completed and clipping of hair around wounds make them more visible. Assess for signs of shock and overall condition of animal and treat appropriately. Attention to instar size will help in determining likely severity of wounds and amount of underlying tissue damage.

There is a timeline that can be followed in the life cycle of the larval instars, the warmer the environmental temperature the faster they will develop. With optimum warm temperatures, in as little as 51 hours from fly eggs being deposited on an animal you could find young third instar larva. (2)

Determining Instar stage:

Instar I (2-5mm) development takes 31-53 hours,

Instar II (6-14mm) development takes 12-42 hours, Instar III (15-20mm) development takes 40-98 hours.

Administration of fluids, IM injection of anti-inflammatory Banamine (flunixin meglumine 0.5-1.0mg/kg SID no more than 3 consecutive days) is recommended for any fawn that euthanasia is not immediately warranted. Banamine serves as an analgesic, anti-inflammatory and has been shown to block some effects of endotoxins produced by myiasis. Administration of Capstar PO, or Ivermectin should be given right away to kill any possible maggots that are missed in the removal process.

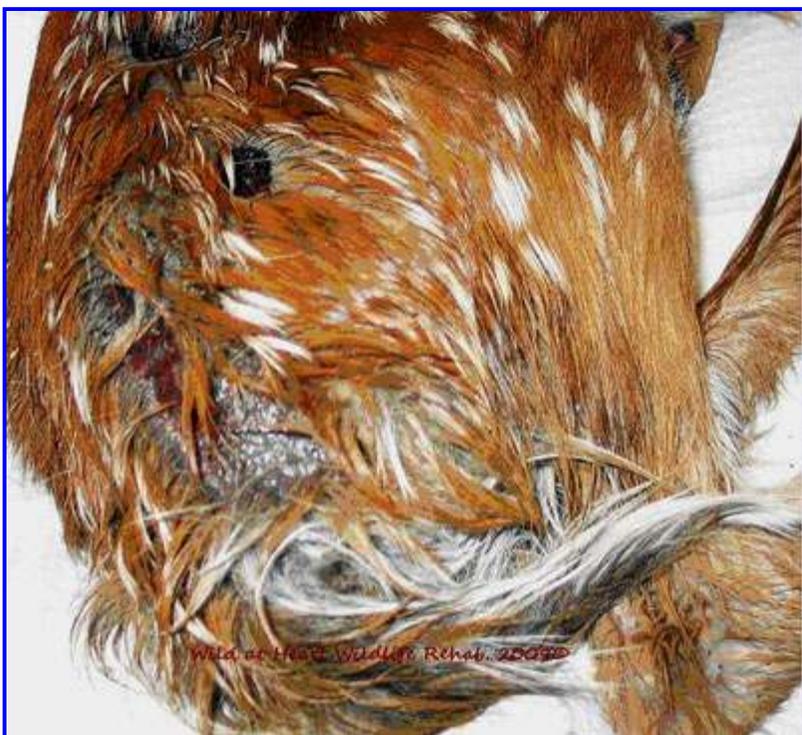
If rectal or vaginal myiasis is present, and animal is a candidate for treatment (no Instar III and no extensive damage) flush rectum using mild wound flush solution/enema, wipe away any maggots from rectal area using dry gauze pads. Vaginal myiasis should be treated similarly with wound flush solution/douche. The author recommends using Capstar solution for enemas/douches to attempt to kill any residual maggots that do not flush out.

After manual removal of visible maggots and fly eggs from hair and skin surface using a flea comb, use clippers to shave hair away from all wound areas. Flush wounds with copious amounts of fluids: Choice of fluids used by rehabilitators responding to survey were: diluted Novalsan, diluted Povidone Iodine, Capstar solution, LRS, and diluted peroxide. Wound flushing will help to wash out many maggots. Direct application of insecticidal sprays to open wounds is not recommended. If maggots are deeply imbedded or in small deep wounds, insecticidal sprays (Screw worm, Adams Flea & Tick, etc.) can be sprayed onto a gauze pad and then held over the wound which can cause the maggots to try and escape by backing out.

Manual removal of remaining maggots using tweezers or hemostats is then necessary. This process unfortunately is painstakingly time consuming, but so far no viable alternative is available. Make sure to check all gland areas well. Interdigital and metatarsal glands often "hide" maggots, inserting open hemostats into gland slits closing then pulling out will often reveal maggots. The majority of maggots in teat area often must be removed manually as they will be partially embedded in tissue. Males penile sheath should be checked well also.

Once all maggots are removed; Flush wounds well with diluted Novalsan (this seems to reduce incidence of secondary infection), make sure to check for pockets or tunnels extending subcutaneously from all wounds and flush out well. Dry all areas well and apply appropriate wound treatment. For more minor wounds topical antibiotic creams (i.e. Silvadene) can be used. For more severe wounds, wound dressings/bandages (Duoderm, wet to dry, etc.). The wounds created by maggots are often similar to burn wounds, so treat accordingly.

A systemic course of prophylactic antibiotics is recommended for animals with deep or several wounds or rectal/vaginal myiasis. Check wounds for any additional maggots during the first 48 hours. Check daily for any signs of abscesses around wounds.



Surface maggots and fly eggs combed out. (Patient #09-10048)



clipped and extensiveness of wound present. (Patient #09-10048)



Severe myiasis teat/belly area. Instar I, II & III present. (Patient



#09-10035)

Severe myiasis rump/hip and tail. T
subcutaneous damage. (Patient #09-

Healing moderate myiasis wounds.

Resources

1. **R. P. Hobson, B. S C , PH.D.** STUDIES ON THE NUTRITION OF BLOW-FLY LARVAE III. The Liquefaction of Muscle. [Online] 1931/received 1932 From the Department of Entomolgy, London School of Hygiene and Tropical Medicine. <http://jeb.biologists.org/cgi/reprint/9/4/359.pdf>.
2. **multiple, Wikipedia.** Common green bottle fly/ WikiProject Insects. *Wikipedia, The Free Encyclopedia*. [Online] 2009. http://en.wikipedia.org/wiki/Common_green_bottle_fly.
3. **Unknown.** Myiasis (with special reference to Waterfowl, Hedgehogs, Elephants, Bears and Lagomorphs (UK Wildlife). *Wildlife Information*. [Online] <http://wildlife1.wildlifeinformation.org/S/00dis/Parasitic/myiasis.htm#TopOfPage>.
4. Deer Fawn/Myiasis Rehabber Survey. 2010.
5. **Scott, Danny W.** *Color Atlas of Farm Animal Dermatology*. Ithaca, NY : Blackwell Publishing, 2007.