

NEW WORLD SCREWWORM (*Cochliomyia hominivorax*)

Animal Group(s) Affected	Transmission	Clinical Signs	Severity	Treatment	Prevention and Control	Zoonotic
All warm blooded animals but most cases occur in cattle, goats and sheep.	Gravid female flies deposit eggs either in wounds or directly onto intact mucous membranes.	Discomfort, decreased appetite, wounds with malodorous, reddish/brown fluid with larvae; slight movement inside a closed wound.	Untreated animals could die. Mortality rates in Texas when disease was endemic in the USA was 20–80% in fawns.	Organo-phosphates (spray, foam, dip, dust) (e.g., (coumaphos, ronnel), or lindane.	Monitoring wounds and treating infested wounds with insecticides Doramectin injection.	Yes

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Sheet completed on: 1 December 2010; updated 1 August 2013

Fact Sheet Reviewed by: Margarita Woc-Colburn; Roberto F. Aguilar

Susceptible animal groups: Mammals with most cases occurring in cattle, goats, sheep and wildlife; however, dogs, and cats may be affected. Birds are rarely affected.

Causative organism: *Cochliomyia hominivorax*

Zoonotic potential Yes, with the young, elderly or infirm higher risk of infection.

Distribution: Current distribution includes: Caribbean islands (eradicated in Curacao, Virgin Islands and Puerto Rico) and northern countries of South America to Uruguay, northern Chile and northern Argentina. Panama was recognized free of NWS in 2006 and a permanent barrier zone was established in the Darien province of Eastern Panama.

Incubation period: After 12-24 hrs, eggs are deposited in wounds or mucous membranes have larvae emerge which burrow into the wound. After 7 days, the larvae exit from the wound and fall to the ground. Pupal period ranges from 7d-2mo (depending on temperatures). Complete cycle takes between 3 weeks and 3 months.

Clinical signs: Animals with screwworm infestation often display discomfort and appear unthrifty and depressed. Other non-specific clinical signs include: separation from group, anorexia, and reduced milk production in dairy cattle. Typically, an open wound is present with malodorous reddish/brown fluid that has either eggs or larvae. Egg masses are found around the wound as “shingle-like” raft of whitish or cream-colored egg. The larvae can be visible or deep inside the wound; closed wounds may have slight movement inside. Larvae can also be observed on intact mucous membranes of body orifices (nose, anus, vaginal area). The wound can enlarge due to multiple infestations and if not treated animal could die within 2 weeks.

Post mortem, gross, or histologic findings: Screwworms do not feed on dead tissue or carrion so larvae are unlikely to be found on post-mortem examination unless the animal died recently. Larvae of different ages are normally found on wounds or natural opening mucous membranes. Other fly larvae may be present in lesion making gross diagnostic difficult. Microscopic lesions are not useful for the diagnosis of screwworm.

Diagnosis: Screwworm is a reportable disease in US. Before collecting or sending any samples from animals with suspected screwworm, federal and state authorities should be contacted. Identification of the eggs and flies are best to left to an entomologist. However, specifically for larvae, they should be removed from the deepest part of the wound and examined grossly by dissecting microscope. Larvae grow from 2mm to fully grown larvae that can reach 1.5cm in length. Larvae are identified by their “wood screw” shape. Screwworm larvae

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have whitish bodies, and can be differentiated from other larvae by the darkly pigmented tracheal tubes on the dorsal aspect of the posterior end of 3rd stage larvae.

Material required for laboratory analysis: Larvae, eggs or flies can be conserved in vials containing 80% ethanol or isopropyl alcohol; formalin should not be used. Larvae should be removed from the deepest part of the wound to reduce the possibility of collecting non-screwworm species; optimal preservation of larvae, in their natural extended state, can be made by killing them in boiling water (15–30 seconds immersion) before storage in 80% ethanol. Suspected screwworm eggs or flies may also be submitted for diagnosis; eggs may be collected using a scalpel as scraper.

Before collecting or sending any samples from animals with suspected screwworm infections, federal and state authorities should be contacted. In the US, screwworm is a reportable disease and should be reported within 24 hours. Samples should only be sent under secure conditions and to authorized laboratories to prevent the spread of the disease. Screwworms can infest humans; samples should be collected and handled with all appropriate precautions.

Relevant diagnostic laboratories:

USDA-APHIS-VS-NVSL

1920 Dayton Ave. (for packages)

P.O. Box 844 (for letters)

Ames, IA 50010

(515) 337-7266

Fax: (515) 337-7397

http://www.aphis.usda.gov/services/report_pest_disease/report_pest_disease.shtml

USDA-APHIS-VS-NVSL-FADDL

40550 Route 25 (for packages)

Orient Point, NY 11957

P.O. Box 848 (for letters)

Greenport, NY 11944-0848

(631) 323-3256

Fax: (631) 323-3366

Treatment: Before any treatment is implemented federal and local authorities must be notified.

Organophosphate insecticides (coumaphos, ronnel) and lindane are effective against newly hatched larvae, immature forms and adult flies. Carbamates and pyrethroids may also be used. In a recent study, nitenpyram showed 100% efficacy on the treatment of myiasis by *C. hominivorax* in naturally infested dogs. Screwworms in wounds are killed by direct application of aerosol, dust or foam that contain any of these products. Removal of necrotic tissue may be necessary and antibiotics may be given when secondary bacterial contamination is present

Prevention and control: In 1966, US was declared officially free of indigenous screwworms therefore any presumptive case must be reported. The OIE International Animal Health Code stipulates that is necessary to follow strict observation of the requirements for international trade.

When importing domestic and wild mammals from countries considered infested with New World or Old World screwworm, veterinary administrations should require the presentation of an international veterinary certificate attesting that:

- 1) Immediately prior to loading, the animals have been inspected on the premises by an official veterinarian and that any infested animal has been rejected for export;
- 2) Immediately prior to entering the quarantine pens in the exporting country:

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- a) each animal has been thoroughly examined for infested wounds by an official veterinarian and that no infestation has been found in any animal; and
 - b) any wounds have been treated prophylactically with an officially approved only larvicide at the recommended dose; and
 - c) all animals have been dipped, sprayed, or otherwise treated, immediately after inspection, with a product officially approved by the importing and exporting countries for the control of New World or Old World screwworm, under the supervision of an official veterinarian and in conformity with the manufacturer's recommendations;
- 3) at the end of the quarantine and immediately prior to shipment for export:
- a) all animals have been re-examined for the presence of infestation and all animals have been found free of infestation;
 - b) all wounds have been prophylactically treated with an approved only larvicide under the supervision of an Official Veterinarian;
 - c) all animals have been prophylactically treated again by dipping or spraying as in point 2) above.

The floor of the quarantine area and transport vehicles must be thoroughly sprayed with an officially approved larvicide before and after each use. The transit route must be the most direct, with no stopover without prior permission of the importing country. On arrival at the importation point, all animals must be thoroughly inspected for wounds and possible new world or old world screwworm infestation under the supervision of an Official Veterinarian. The bedding material of the vehicle and the quarantine area should immediately be gathered and burned following each consignment.

In addition: any imported animals from areas where screwworms are endemic must be thoroughly inspected for wound and infestations before they are allowed to enter premises. Wounds that do not appear to be infested are treated with an insecticide as preventative measure. Any infestations that become apparent after an animal enters the country must be treated promptly.

Suggested disinfectant for housing facilities: Facilities where screwworm was diagnosed and vehicles that may contain adults or immature screwworms should be sprayed with insecticides; any bedding material used in the area where animal was quarantined should immediately be gathered and burned

Notification: Any presumptive screwworm infestation must be reported to both state and federal (Area Veterinarian In Charge -AVIC) authorities.

Measures required under the Animal Disease Surveillance Plan: Because New World screwworm has been eradicated from the US, the National Animal Health Surveillance System (NAHSS) does not have a program for active surveillance at this time. However, as this is a reportable disease, state and federal (AVIC) authorities should be notified of any presumptive screwworm infestation.

Measures required for introducing animals to infected animal: In non-endemic regions, any infected animal is quarantined until treatment is complete and the wounds have healed. Treatment of the environment, as explained above, may also be necessary.

Conditions for restoring disease-free status after an outbreak: Areas must be sprayed with approved larvicide; the disease has been eradicated in the US by the Sterile Male Release Technique (SMRT) program and therefore if there is indication of infection in the U.S.A the USDA-APHIS must be involved on any discussion about free-status of a premise.

Experts who may be consulted:

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