**Animal Facility SOP 43.2**
**Parasite Treatment**

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## I. Purpose

The purpose of this SOP is to describe treatment of intercurrent parasite infections.

## II. Scope

This SOP is intended for use by all personnel who use animals in the BSSC Vivarium including PIs, laboratory faculty and staff, husbandry personnel, veterinary personnel etc.

## III. Definitions

- **Pinworms -** endoparasitic worms that live in the large intestine or cecum. Rodent pinworms include 2 genera, Aspiculuris and Syphacia, that have different epidemiology. The treatment paradigm used is effective against both.
- **Fur Mites -** ectoparasites that live at the base of the fur and feed superficially on skin secretions and stimulate a host immunological response. Mouse fur mites include several different genera that have similar life cycles
- **Fenbendazole -** a benzimidazole anthelmintic used in the treatment of pinworm infestation.
- **Ivermectin -** and avermectin compound used in the treatment of parasitic infestations including pinworms and mites**.**
- **Selamectin -** an avermectin compound used in the treatment of fur mites. Not reported to have the same side effects as ivermectin.
- **PO -** Oral administration or a substance
- **Zoonotic/Zoonoses -** diseases that can be transferred to humans from animals.

## IV. Summary of the Problem

Animal facilities, particularly those where animals are breeding, may become infected with parasites. Once present, particularly in large diverse colonies, difficulties in detection may result in incomplete eradication, resulting in periodic evidence of parasitic infestation.

Mouse and rat pinworms are transferred from one animal to another (an animal may also self-infect) via the fecal-oral route. Although pinworm eggs are sticky and can remain viable for months in the environment, most pinworms are transmitted via direct contact with other rodents or rodent fecal material, and most commonly from parent to offspring. Tracking infections can be frustrating because Infected rodents not uncommonly test negative on the usual tests: even PCR of fecal material is not 100% sensitive.

Fur mites are transferred from one animal to another via direct contact between animals. Mites and mite eggs are closely-associated with the fur of the animal, and do not contaminate the environment. As with pinworms, infected animals may test negative on common tests, complicating eradication efforts. Fur mites are not zoonotic.

## V. Treatment

### Pinworms

1) Treat continuously for 8 weeks orally with fenbendazole 150 ppm.
2) Decontaminate the environment (including cages, racks, equipment, and all areas where animals come into contact, including lab spaces and equipment). Heat, steam, soaking in chlorine dioxide or cidex pro are reported to inactivate eggs. The most effective method is removal by mechanical scrubbing with a detergent disinfectant i.e. “elbow grease”, followed by thorough rinsing.

When an infection is detected, the **entire room and all collaborators** will be quarantined during follow up testing and all animals in an infected colony will be treated as described below.

1. <u>Fenbendazole</u>
   Oral - delivered in impregnated feed or water Medicated feed is provided at 150 ppm.
   Duration - 8 weeks continuous treatment
   Fenbendazole is the safest treatment for pinworms. Side effects are few, and dependent on the specific research being conducted. Those conducting behavioral tests or cancer studies should review the available literature to determine if tests should be suspended during treatment.

2. <u>Ivermectin</u>
   Oral - delivered in the feed or water or topically sprayed onto the fur of all animals old enough to have fur, per SOP.
   Duration - 4 treatments at 2 week intervals
   Possible side effects - although ivermectin is generally safe, some transgenic animals, particularly animals with mutations in the ABCB1 gene (previously

known as  (MDR1) that result in loss of function, or animals with gene insertions that disrupt this gene, may quickly die when exposed to ivermectin. It is important to test a few animals of each strain to determine if the strain will tolerate ivermectin before treating the entire colony.

**Fur Mites**

All cages in the colony, plus those of known collaborators will be tested and treated as appropriate.

1. Ivermectin
    a. Oral - delivered in the feed or water at 150ppm. Topical - delivered directly onto the fur by spray or pipette as per SOP.
    b. Duration - 8 weeks
    c. Possible Side Effects - although ivermectin is generally safe, some transgenic animals, particularly animals with mutations in the MDR1 gene or animals with gene insertions that disrupt this gene may quickly die when exposed to ivermectin. It is important to test a few animals of each strain to determine if the strain will tolerate ivermectin before treating the entire colony.
2. Selamectin
    a. Where ivermectin cannot be used, selamectin administered topically by pipette to individual animals per SOP.  This should be arranged with the veterinarian.

## VI. Communication

When a PI's colony is found to be infested, The PI will be contacted by the facility manager or the veterinarian to discuss the protocol for eradication  (ie treatment, quarantine, or euthanasia)  depending on the needs of the individual study.  The PI is responsible for communicating the treatment plan with all laboratory personnel and ensuring compliance.

References:

**Pinworms**
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