Swine Ectoparasites: Sarcoptic Mange Mite

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Description and Biology

Sarcoptic mange is caused by a microscopic parasitic mite (Figure 1) that lives and feeds in tunnels in the epidermal skin layer of the host (Davies and Moon 1990). Using digestive enzymes to dissolve the host tissues these mites expand their tunnels as much as 3-5 mm per day. Male and female mites usually mate on the surface of the skin. Soon after mating, the newly fertilized female constructs a new feeding tunnel in which to lay up to 3 eggs per day over a 2-3 week period. Generally the eggs hatch in 3-5 days. The larvae continue to expand the feeding tunnels for about 2-4 days before becoming nymphs. Nymphal mites continue to develop 4-6 days before becoming adults. Mite life stages consist of egg, a six legged larva, followed by 8 legged nymph and adult stages. The life cycle from egg to adult takes about 10-14 days and occurs entirely on the host. Mite transmission is primarily by direct contact with infested pigs.

Figure 2: Sarcoptic mange mite, Sarcoptes scabiei, female. Photos by D. Davies and R. Moon, University of Minnesota, Department of Entomology.

Mite infestations cause severe irritation for the host and infested animals scratch and rub against any object to relieve the itching. Antigens associated with the digestive enzymes, mite exoskeleton, exuvia, eggs, and feces all contribute to the irritation experienced by the host. The most common symptoms are pruritic dermatitis and hypersensitivity (Jacobson et al. 1999). Hypersensitivity may be immediate or delayed by several weeks after the initial infestation. Generally the infestation begins on the inner side of the ear before spreading to the head, neck, and body. Infested animals experience severe hair loss. The skin of infested animals may become inflamed, cracked and thickened. Encrusted lesions may develop on the ears and face. Although present on infested pigs year around, clinical indications of mites are most noticeable during the winter. Crowding pigs contributes to the transmission of mites.

Observational monitoring for mange is limited to indications of pruritus or excessive scratching on live pigs (Cargill and Dobson 1979). Confirmation of the infestation traditionally relied on deep skin scrapings and microscopic examination of tissues for the presence of mites. In recent years the use of enzyme-linked immunosorbent assays (ELISAs) are used for the detection of antibodies against mites (Bornstein and Wallgren 1997, Hollanders et al. 1997). Prevalence of mange in

swine varies greatly. Dutch estimates suggest that 5% of the herds are infested (van der Heijden et al. 2000) and perhaps 45% of German swine farms are infested (Damriyasa et al. 2004). Little data exists on the prevalence on mange mites among swine in the US.

Management of mange has traditionally relied upon the macrocyclic lactones class of compounds with activity against ecto and endoparasites. In the last 30 years ivermectin and doramectin have been the mainstay for mite control (Alva-Valdes et al. 1984, Arends et al. 1999). Mite resistance to these compounds has not appeared in swine herds, however isolated populations of Sarcoptes scabiei in humans suggests that resistance to ivermectin is possible (Currie et al. 2004). Other conventional acaricides include compounds in the amidine, organophosphate and pyrethroid classes such as amitraz, phosmet and permethrin respectively. Following label directions, these materials may be applied a spray or pour-on.

Sarcoptic mange is a serious problem for organic swine production. For new herds it is essential to buy pigs from a mange free herd. In infested organic herds, eradication may be the only choice. This is achieved by using conventional treatments administered to every pig simultaneously. Subsequently the animals will reinter the organic stream following the appropriate withdrawal period.

Demodectic mange, Demodex phylloides
Demodectic mange occurs occasionally in swine. Caused by the follicle mite Demodex phylloides, this spindle shaped mite lives in skin pores and hair follicles around the snout and eyes, inner thigh and abdomen. Transmission is by direct contact.

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