

Swine Ectoparasites and Pests of Swine

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Introduction to Arthropods of Swine and their Lifecycles

Arthropods of importance to swine production include the itch mite, hog louse, house fly, stable fly, and other biting flies (Holscher et al. 1999). Their management reduces the risk of disease and production losses resulting from poor growth, development and feed conversion. Biting and non-biting insects occasionally associated with swine include mosquitoes (Culicidae), black flies (Simuliidae), biting midges (Ceratopogonidae), little house flies (*Fannia canicularis*), dump flies (*Hydrotea aenescens*), vinegar flies (*Drosophila repleta*) and moth flies (Psychodidae). Of the aforementioned arthropods, the itch mite and hog louse are obligate ectoparasites, the live and depend on their host for sustenance. Facultative parasites include the biting flies; stable flies, mosquitoes, and biting midges that rely upon a suitable host to provide a nutritious bloodmeal to propagate the species. Facultative parasites spend a significant portion of their life off the host. Although not classed as parasites, the house fly, dump flies, vinegar flies, moth flies and cockroaches are arthropods that contribute significantly to the pest management problems associated with swine production.

The growth and development of arthropods is temperature dependent. Environmental conditions on the host are relatively stable, providing optimal temperatures for obligate ectoparasites. Optimal temperature for the hog louse is near the body temperature of the host. For those arthropods that spend a significant portion of their lives off the host, ambient environmental conditions play an important role in their developmental time. For example optimal temperatures for the house fly is near 30oC (86oF) yet when temperatures are cool near 10oC (50oF), house fly activity nearly ceases.

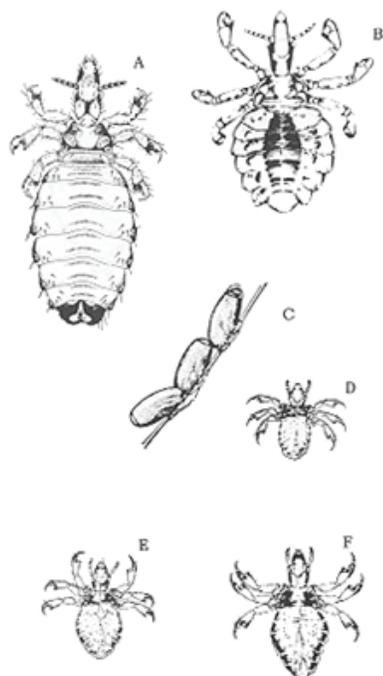
Table 1. Approximate developmental time (in days) for arthropod pests of importance to swine production.

| Pest Species | Life Stage | | | | Egg to Adult | |
|--------------|------------|-------|-------|-----------------|--------------|------------|
| | Egg | Larva | Nymph | Pupa | Adult | |
| Itch Mite | 3-5 | 2-4 | 4-6 | NA ¹ | ? | 10-14 days |
| Hog Louse | 10-14 | NA | 10-14 | NA | 28 | 14-21 days |
| House Fly | 1-2 | 4-6 | NA | 3-4 | 14 | 10-14 days |
| Stable Fly | 2-4 | 10-14 | NA | 6-8 | 14 | 20-30 days |

¹ Life stage not applicable

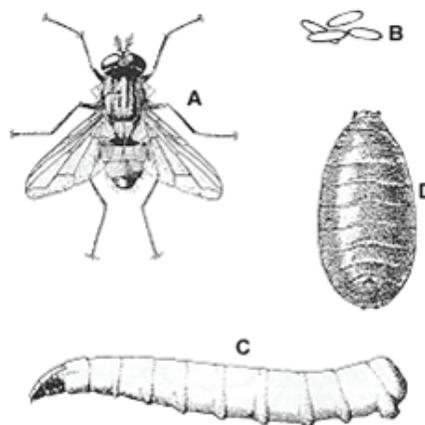
Having a thorough understanding of the life stages of pests and parasites is important to identifying and solving the pest problem. Arthropods undergo two forms of metamorphosis as they develop. Hemimetabolism refers to arthropods

with successive lifestages that resemble the adult. The hog louse is a hemimetabolis insect, after the egg hatches each nymphal lifestage although smaller resembles the adult (Figure 1a). Holometabolis insects are characterized as having distinctly unique lifestages morphologically. The house fly larva, pupa and adult are dissimilar (Figure 1b). The larval stage of the house fly is divided into 3 developmental phases, called 1st, 2nd and 3rd instars.



Hog louse. A, Female. B, Male. C, Eggs glued to bristle. D-F, Nymphs.

A.



B. House fly. A, Adult. B, Eggs. C, Larva. D, Pupa.

Figure 1: Arthropod Metamorphosis: Hemimetabolis (A), immature life stages of the hog louse resemble the adult. Holometabolis (B) immature insect life stages are distinctly different from the adult as in the house fly (Harwood and James 1979, Williams et al. 1985).

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