



G70 Feeding Patterns of American (*Periplaneta americana*) and German (*Blattella germanica*) Cockroaches on Pig Skin

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After attending this presentation, the attendees will understand the characteristics of *Periplaneta americana* (Linnaeus) (Blattodea: Blattellidae) and *Blattella germanica* (Linnaeus) (Blattodea: Blattellidae) feeding sites on epidermal tissue.

This presentation will impact the forensic sciences community by educating attendees about cockroach feeding on human remains and variables that can affect their associated feeding behavior.

Cockroaches are voracious consumers of a wide variety of organic material and debris. They are also commonly found in and around human dwellings. Consequently, it is not uncommon to discover human remains exhibiting signs of cockroach feeding. Because cockroaches tend to feed on just the top layers of epidermis, their bites and feeding sites closely resemble second degree burns or abrasions. Postmortem injuries caused by cockroach feeding are often misinterpreted as antemortem injuries which can lead to the suspicion of foul play even when none exists.

The American and German cockroaches are two of the most common species of cockroach found in residential areas. The differences in feeding behavior between these two species of cockroach have not been characterized. Consequently, it is currently not possible to determine which species fed on a given set of remains. Furthermore, no information is available about the effects of temperature or population size on the feeding habits of either species.

Studies were conducted to observe the effects of temperature and population size on the feeding behavior of both American and German cockroaches. Pig epidermal tissue was used as a substitute for human epidermis. All cockroaches were starved for 24 h prior to the study and cockroaches not used in previous trials were obtained for each replicate. In order to understand the effects of population size on feeding behavior, 100, 150, or 200 American and German cockroaches were exposed to a 124.63 cm² area of pig epidermis for 48 h. The experiment was conducted at 27°C RH 80±10% and a photoperiod of 12:12 [L:D] h. Pig epidermal tissue exposed to each species was examined individually and not in mixed cultures. The effects of temperature on feeding behavior were tested using groups of 150 American or German cockroaches. One hundred and fifty individuals of each species were kept in growth chambers maintained at 15°C, 21°C, or 27°C. All growth chambers had RH 80±10% and a photoperiod of 12:12 [L:D] h. Pictures of the pig skin from both studies were taken with a digital camera every 6 h for 48 h. Feeding sites were identified and measured using SigmaScan Pro 5, and percent area damaged due to cockroach feeding was determined.

According to these studies, the amount of epidermis damaged due to cockroach feeding was positively correlated to both density and temperature. Epidermis that was exposed to 200 of either species of cockroach was damaged far more than skin exposed to lesser densities. Both American and German cockroaches showed very little feeding activity at 15°C, suggesting a minimum temperature for feeding. At 27°C, both species of cockroach consumed the most area. It is anticipated that the outcome of these studies will be useful in better identifying and understanding the interactions between anthropophagic roaches and humans in forensic investigations.

Cockroach, Insect Feeding, Epidermis