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## “Column E Explanations” - 2015 USDA Annual Report

Registration Number: 21-R-0124

Customer ID: # 400

Species: silver-haired, and big brown bat

Total Number of Animals: 7

Explanation of procedure(s) producing pain and/or distress: Bats collected from the wild by the investigators (who possess all necessary federal & state permits) are intentionally infected with one of three different rabies virus (RABV) strains (after initial animal quarantine). These studies are designed to understand (a) the susceptibility of bats to RABV strains that are more frequently found in other bat species (thus addressing if bats can transmit different virus strains as “heterologous hosts”); and (b) the effect of hibernation on RABV maintenance in bats. To address this second scientific aim, the investigator uses an artificial hibernaculum equipped with an internal camera to allow animal viewing 24 hrs/7 days per week. Additionally, an infrared thermometer is employed to measure internal body temperatures of bats in order to monitor general health status.

Bats are experimentally infected with known doses and strains of RABV, recognizing that they could become ill after virus inoculation. Due to variable RABV pathogenesis and individual bat’s immune response, it is quite possible that inoculated bats will not develop rabies, as has often been observed in the lab. Regardless of the study being conducted, animals that were inoculated with RABV were monitored twice a day, seven days a week. Because early signs of rabies are frequently difficult to verify, it is necessary to closely observe animals during the incubation period where clinical disease is expected 7 to 45 days post inoculation. When clinical signs are first suspected (e.g. slight weight loss, minor behavioral changes), animals are monitored every three hours during the day (8:00, 11:00, 2:00, 5:00), and once during the evening (8-10:00). Bats are euthanized once signs of rabies are more strongly suspected (e.g. lack of appetite, aggression, obsessive grooming, ataxia). In this reporting period, only 7 of 45 bats inoculated with rabies virus became symptomatic for rabies, and all seven were euthanized prior to becoming morbid.

Scientific justification for why pain and/or distress could not be relieved: The researchers are studying a bat’s response to an administered virus dose and do not want to confound data from the study by introducing drugs. Analgesics might reduce the symptoms thought to be caused by RABV infection. This would ultimately waste animals if the use of pain alleviating drugs were to bias the study’s outcome by inadvertently affecting the animals’ response to RABV infection. Allowing the animals’ immune system to react to the presence of virus without the influence of any delivered drugs was a key element of the study to understand RABV maintenance in bats.