Case Definition

Acarapisosis of honey bees (Acariosis, Acarine) (Monitored)

December 2023

1. **Disease Information**
   - **1.1 General Disease and Pathogen Information:** Acarapisosis or acariosis or acarine disease is a disease of the adult honey bee (*Apis mellifera*) and other *Apis* species. It is caused by infestation with the Tarsonemid mite (tracheal mite) *Acarapis woodi*. The tracheal mite is an internal parasite of the respiratory system that lives and reproduces in the prothoracic trachea of the honeybee, where it feeds on the host's hemolymph. They may also be found in the head, thoracic, and abdominal air sacs. Mites are spread among nestmates through direct contact with infested individuals. *A. woodi* has a nearly cosmopolitan distribution, likely being found where *A. mellifera* colonies are managed. Two additional *Acarapis* species found in the U.S., *A. externus* and *A. dorsalis*, are confined to the exterior of honey bees and are thought not to have severe impacts on honey bee health.
   - **1.2 Clinical Signs:** Clinical signs are nonspecific and resemble those of other diseases. Common clinical signs include a distended abdomen, disjointed wings, and an inability of infected bees to fly leading to a tendency for them to crawl in front of the hive or climb nearby blades of grass. Dysentery may also be present in infected bees. As the infection severity is correlated with the parasitic load present, clinical signs of disease may go undetected in less severe cases and only become apparent when infection worsens. High parasitic loads can lead to obstructed air ducts, lesions in the tracheal walls, and depletion of hemolymph. With increasing parasite infestation, the tracheal walls become opaque and discolored with blotchy black areas. Tracheal mite infections can peak in winter through early spring in the Northern hemisphere. Mortality of infected bees ranges from moderate to high.
2. **Laboratory Criteria**
   - **2.1 Agent Isolation and Identification:** Parasites can be visualized by dissection of individual bees to isolate the trachea, or by grinding of whole bodies minus wings and legs, followed by microscopic inspection. Inspection of bulk samples is quicker but less accurate than dissection of individuals. Staining is also available for visualization of mites. A direct enzyme-linked immunosorbent assay (ELISA) is available; however, it is prone to false-positives. A specific polymerase chain reaction (PCR)-based assay is also available for detection in honey bees and hive debris.
   - **2.2 Agent Characterization:** Detection of *A. woodi* in samples using PCR methods is faster, more efficient and may be more sensitive than using microscopy. However, care must be taken when interpreting results from PCR tests due to genetic similarities between *A. woodi* and closely related species, *A. dorsalis* and *A. externus*, to avoid false positives. Positive detections with PCR should be confirmed with microscopy.

2.3 Serology: NA.

3. **Case Classification**
   - **3.1 Suspect Case:** Honey bees or other *Apis* species with compatible clinical signs OR an epidemiologic link to a confirmed case.
   - **3.2 Presumptive Positive Case:** A suspect case with a positive ELISA or PCR test.
   - **3.3 Confirmed Positive Case:** A suspect case with positive visualization of mites via microscopic techniques.
4. **Reporting Criteria:** Acarapisosis is a U.S. monitored condition that is reportable monthly under the APHIS National List of Reportable Animal Diseases (NLRAD).
   - **4.1** NLRAD reporting in accordance with the NLRAD Standards for monitored diseases; and by APHIS to the World Organisation for Animal Health (WOAH).