



## Case Definition

### European Foulbrood of Honey Bees (*Melissococcus plutonius*) (Monitored)

December 2023

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#### 1. Disease Information

**1.1 General Disease and Pathogen Information:** European foulbrood (EFB) of honey bees is caused by the bacterium *Melissococcus plutonius* (previously classified as *Streptococcus pluton*). Despite the name, it is found in North and South America, Australia, the Middle East, and Asia. Infection is considered enzootic as mechanical contamination is the most common cause of spread. Recurrence of the disease is common.

**1.2 Clinical Signs:** The most characteristic clinical sign of EFB is the death of larvae shortly before they are due to be sealed in cells, giving a uniform appearance to the comb. Changes can sometimes be seen in the brood comb as well. Often the brood comb is left unsealed. In some of the more advanced cases, the comb may be sealed with discolored, sunken, or punctured capping. Dead brood are usually young, unsealed larvae though sometimes older sealed larvae are affected. Dead larvae are typically in the coiled stage with a dull white coloring that, over time, turns yellow, then brown, and finally dark brown or black. Dead brood develop a watery and granular consistency and may produce an odor ranging from slightly sour to penetratingly sour. They ultimately form a rubbery, dark brown scale that does not adhere tightly to the cell wall.

#### 2. Laboratory Criteria

**2.1 Agent Isolation and Identification:** Identification is possible through microscopic examination of suitable preparations of clinically affected larvae for presence of numerous lanceolate cocci. Additionally, culture methods can be employed to identify the bacterium. The isolated bacterium can be identified and differentiated with a simple tube agglutination test. Furthermore, polymerase chain reaction (PCR) and hemi-nested PCR provide accurate identification of the causative agent. The hemi-nested PCR allows direct analysis of larvae, adult bees and honey bee products.

**2.2 Agent Characterization:** NA

**2.3 Serology:** NA.

#### 3. Case Classification

**3.1 Suspect Case:** honey bees with

**3.1.1** consistent clinical signs; **OR**

**3.1.2** an epidemiologic link to a confirmed case.

**3.2 Presumptive Positive Case:** a suspect case that has

**3.2.1** a positive result on culture; **OR**



**3.2.2** a positive result through tube agglutination.

**3.3 Confirmed Positive Case:** a suspect case with a positive result on PCR.

4. **Reporting Criteria:** European foulbrood is a U.S. monitored disease 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 \(WOAH\)](#).