

AMERICAN FOULBROOD

PREVENTION
DIAGNOSIS
CONTROL

American foulbrood (AFB) is the most devastating of the honey bee brood diseases. It is easily transmittable and highly deadly. The condition is caused by the spore-forming bacteria *Paenibacillus larvae*^{1,2}. Just a small number of spores can infect healthy three-day old larvae³. While the bacterium can be killed by antimicrobials or environmental extremes⁴, the millions of spores it produces are extremely resilient and can remain viable in honey and beekeeping equipment for over 40 years^{5,6}.

Spread of the Disease

The disease is transmitted in various ways:

- In infected colonies, young worker honey bees inadvertently spread the spores throughout the hive when they attempt to remove spore-laden dead larvae⁷.
- Robber bees from uninfected hives may take the pathogen back to their hives when they forage honey from a colony that is infected with the disease⁸.
- Humans can transmit the disease by exposing a healthy colony to contaminated bees or equipment such as frames, boxes, or tools¹⁵.

Prevention

Preventing a hive from becoming infected is the easiest and best method for managing the disease:

- When purchasing a colony, find out if it was treated with antibiotics. Medicines may be masking symptoms of an already infected colony; the hive will likely become symptomatic if treatment ends^{11,16}.
- Before purchasing or accepting used beekeeping equipment contact a bee inspector to have it examined for the disease.
- Never switch frames, boxes, or other equipment from an infected

hive to a hive that is free from the disease.

- Sterilize tools and personal protective equipment after working in a hive you suspect is infected.
- Don't share unsterilized tools or equipment with other beekeepers.
- Put unused beekeeping equipment in a bee-proof location.
- Prophylactic use of bacteriophages (phage) therapy may prevent infections^{9,10}.
- Antibiotics can be used preventatively in specific high-risk circumstances, but only under the direction of a licensed veterinarian.

KNOW THE SYMPTOMS

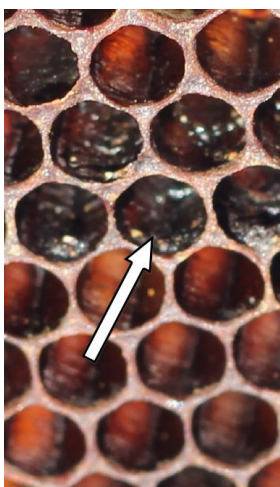


Figure 1

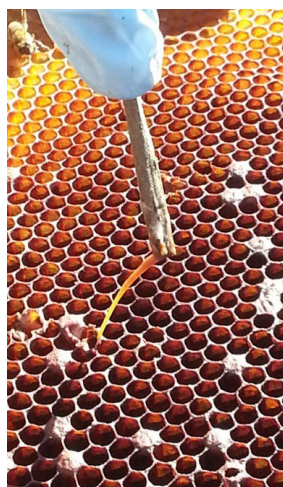


Figure 2

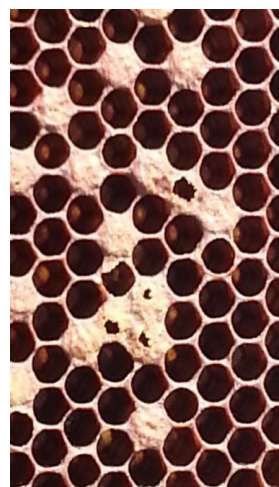


Figure 3

In order to make a proper diagnosis, be familiar with signs of the disease: Fig. 1: Prepupae form dark “scales” in their cells, which the bees have difficulty removing. Fig. 2: Cell caps may appear sunken and dark in color and “ropy” when penetrated. Fig. 3: Spotty brood pattern with small perforations appear in the capping. Other symptoms include dead brood that are tan to dark brown, pupae found with extruded tongues, and a distinct, foul odor. These visual symptoms are helpful in diagnosis, however other brood maladies have similar symptoms. Testing dead brood is the best way to know if a colony is infected. Testing is available through your bee inspector.

Management

Destruction of beekeeping equipment by burning or deep burial is the safest and most effective way to control the disease. However if the disease is detected early enough, a beekeeper may want to pursue treatment options.

- Oxytetracycline, Tylosin Tartrate, and Lincomycin are the only antibiotics that are approved for treatment of AFB¹⁷.
- To obtain antibiotics, a veterinarian must either write a Veterinary Feed Directive (VFD) or prescription. A list of veterinarians that will work with beekeepers can be found at the UDAF web address below.
- Some strains of AFB have become resistant to antibiotics^{12,13,14}.
- If treatment is unsuccessful burning or deep burial of the equipment is the most prudent course of action. This is necessary due to the long-lived infectious spores that are left behind on exposed equipment.



Contact Information and Resources

This informational factsheet is brought to you by the Utah Department of Agriculture and Food.

To request a free hive health inspection call 801-982-2313 or email udaf-insects@utah.gov

Find veterinarians that can prescribe antibiotics at: <https://ag.utah.gov/farmers/plants-industry/apiary-inspection-and-beekeeping/find-an-apiary-veterinarian/>

Sources

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