

How do I submit tissue samples for necropsy testing at CAHFS diagnostic lab?

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Background: When an animal dies unexpectedly, the California Animal Health and Food Safety (CAHFS) lab is an excellent resource to help figure out why. For producers in Northeastern California, the distance between the ranch and the northern-most CAHFS lab in Davis, CA often poses a logistical challenge. If you are unable to drive a carcass to Davis, consider shipping tissue samples. First, discuss the case with your veterinarian and determine whether they can perform a field necropsy or if you should complete sampling following the process outlined below. A definitive diagnosis is not always possible even if all the sampling is done correctly. However, submitting to the diagnostic laboratory greatly enhances your chance of determining the cause of death.

Important note: Always wear gloves when handling a carcass to prevent contact with potential zoonotic pathogens. Although rare, animals that die from anthrax pose a public health risk. Do not open a carcass if you it lacks rigor mortis (stiffening) and you see bloody discharge from body openings – these could be signs of anthrax. It is advised that you work with your veterinarian for all animal-health related problems.

Step 1: Take pictures of the carcass and surroundings. Understanding the landscape (position of animal(s), location, plants present, etc.) can provide the context necessary to make an accurate diagnosis and recommend tests specific to your circumstances.

Step 2: Call the CAHFS lab and discuss your case before sampling/shipping.

Discussing the case history with a CAHFS lab veterinarian sets up your sampling for success—be ready to discuss herd history, particularly for an aborted fetus (e.g., gestational age, dam age, previous abortions, vaccination history, recent changes in management, etc.). Also, check if any additional samples (besides those listed below) are required for your specific case. **CAHFS lab phone: (530)752-8700.**

Step 3: Gather and prepare your sampling equipment and review sampling strategy.

- **Equipment:** Gloves, sharp knife, garden shears/loppers to open rib cage, Ziploc bags for organ/tissue samples, tweezers, small scissors, container for liquid samples, and blood sampling equipment (needle, syringe and red-top tube).
- **Strategy:** Convenience sampling (i.e., bagging a random slice of tissue) often misses the problem. Minimally, sample at the junction of normal and abnormal tissue. Even better yet, take samples of both normal tissue and the “active problem”. It can be difficult to differentiate between tissue breakdown and actual lesions. A quick photo of the chest and abdominal cavities before sampling can be a useful tool to convey your findings to your veterinarian.



Sampling equipment (photo credit: CAHFS lab).

Step 4: Collect samples (see shipping instructions on back for details).

Collect tissue/organ samples in individual Ziploc bags. Collect liquid in a leak-proof container. Double bag samples to help avoid leakage. Refrigerate (do not freeze) samples prior to shipping with frozen ice packs (not ice cubes).

Note: The more sample you can provide, the better—the CAHFS lab will divide up the tissues submitted to conduct multiple tests.

Sampling protocol:

Mature animals, replacements or young: Place the following samples in a Ziploc bag, keep refrigerated and ship with cold packs:

- Liver, lung, kidney, and heart – fist-sized pieces of each (place in separate Ziploc bags).
- Eyeball – one is ok, both is ideal.
- Rumen content (forage + liquid) – approximately 2 cups taken from different sacs.
- Urine – 10 ml (approximately 2 teaspoons), aspirate with syringe.



Left: Heifer that died from bloat (photo credit: CAHFS lab).



Left: Esophagus of a heifer that died from bloat. Note the differing colors in the mucosa; this is known as a 'bloat line' and is rarely observed in bloat cases (photo credit: CAHFS lab).

Fetus: Sending an intact fetus, placenta and dam serum provides you with the greatest chance of determining the cause of abortion. If that isn't possible, see the sampling protocol below. Keep samples refrigerated and ship with cold packs.

- From fetus:
 - Fetal fluid – open chest cavity, take a sample of thoracic fluid OR collect blood in a red-top tube.
 - Abomasal content – collect in a small, sterile container (red-top tube works well).
 - Liver, lung, kidney, heart, and brain – obtain a fist-sized sample (at least), place in individual Ziploc bags.
 - Optional (but helpful) – muscle (diaphragm or thigh), thymus, lymph nodes, and adrenal glands.

Note: Brain may be too soft to divide into smaller samples- if so, put whatever you can in a Ziploc. Alternatively, cut off entire head and ship with cold packs.

- From dam:
 - Placenta – bag as much as possible.
 - Serum – collect blood in a red-top tube.



Left: Aborted ovine fetus (photo credit: CAHFS lab).

Paperwork and shipping instructions:

The CAHFS lab Client Guide is an excellent resource! Click [HERE](#) for the guide or visit cahfs.vetmed.ucdavis.edu, click "Submit a Specimen", and scroll to "Documents" to access the guide.

IMPORTANT INSTRUCTIONS:

1. Complete the submission form on p. 3; supply as much history as possible.
2. Follow packing guidelines on p. 4; double bag all samples to avoid leakage.
3. Follow shipping instructions on p. 5.

Receive a shipping discount! CAHFS has contracted commercial service with FedEx for packages under 40 lbs. You can receive a discount by using the University's FedEx account number—obtain by calling the UC Davis CAHFS laboratory receiving department during normal business hours (530)752-6253. ***see p. 5 of guide for full details.**