



AHDC Contacts

Phone: 607-253-3900 Web: diagcenter.vet.cornell.edu
Fax: 607-253-3943 E-mail: diagcenter@cornell.edu

Bronchoalveolar Lavage (BAL) Fluid Collection for Fluid Analysis and Culture

Supplies

- BAL Tubes (Bivona – 3 meter length, 11 mm outside diameter, 800-258-5361)
- Sampling vials: one culture, one cytology (contains EDTA for centrifugation and prep of air-dried smears)
- 10 cc syringe to blow up cuff
- 250 ml bag 0.9% saline - 3-way stopcock
- 60 ml syringes (3) - 1 specimen cup
- 18 gauge needle - Sterile lubricant

Procedures

This is not a sterile procedure and is best performed with at least 2, but preferably 3 people.

1. Lay supplies out within easy reach
2. Check cuff on BAL tube
3. Fill (3) 60 cc syringes with saline
4. Physically restrain the head of the cow with the neck fully extended to facilitate passage of the BAL tube into the trachea. (We prefer to use xylazine @ 10-20 mg for an adult Holstein IV prior to this procedure.
5. Clean the nostril through which the BAL tube will be introduced. The cuffed end of the BAL tube is passed through the ventral nasal meatus into the trachea. The cow will cough to indicate proper placement, but shaking the trachea to feel for a “rattle” validates the position within the tracheal lumen.
6. Pass the BAL tube until there is resistance.
7. Inflate the cuff of the tube and gently pull on the tube to ensure that there is a good seal.
8. Inject 60 ml of saline and then aspirate using the same syringe.
9. Either disconnect the syringe or use a stopcock valve to expel air from the syringe.
10. Repeat the aspiration 2 to 3 times until no further fluid is retrieved.
11. Repeat this procedure with each of the 60 cc syringes of saline (total of 3 times).
12. For each 60 ml syringe, you may obtain 30-50 cc frothy (surfactant), slightly turbid fluid.
13. Deflate the BAL cuff and remove the tube.
14. Empty the syringes into the specimen cup, saving a small aliquot from the final syringe for culture.
15. Mix the specimen cup fluid and submit an aliquot for fluid analysis.
16. Find a laboratory with experience reading BAL fluid cytology to determine your differential count.
17. Find out from the AHDC the preferred vol. of fluid, transport container, and preservative for the best analysis.
18. The BAL tubes can be re-used. Clean the exterior and lumen of the catheter with dilute Chlorhexidine solution, rinse with water, expel any fluid from the lumen and let dry either coiled or hung over a hook in a clean, dust-free area of the clinic.

Indications and Interpretations

Bronchoalveolar lavage (BAL) is a safe, simple and inexpensive technique that can be performed in the field without sophisticated equipment or advanced skill. BAL provides an excellent sample of epithelial lining fluid for characterization of diffuse lung diseases and airway inflammation. Lower airway inflammation of cattle may reflect irritation, allergy, and/or diffuse infection typical of poor air quality in an environment with inadequate ventilation, sub optimal cleanliness, over crowding and/or commingled age groups of cattle. In other species, BAL fluid cytology has better correlation with pulmonary histopathology than tracheal fluid. But the latter fluid is the preferred sample to determine the bacterial cause for bronchopneumonia in a herd of cattle.

In a cytocentrifuged BAL sample, with smears examined at high power, we believe that a normal cell differential is similar to that of horses: 40-60% macrophages, 30-60% lymphocytes, less than 5% neutrophils, less than 2% mast cells and less than 0.5% eosinophils.

Source: University of Wisconsin, School of Veterinary Medicine, Madison, WI