

Interpretation of E. coli Found in Intestinal and Fecal Samples

E. coli is **normal flora** within the gastrointestinal tract of mammals, and is recovered in almost all fecal or intestinal cultures.

E. coli is implicated in diarrhea in three ways:

- ❖ Virulence factor-positive strains (**ETEC**) causing increased fluid secretion in the small intestine leading to secretory diarrhea in neonatal animals.
- ❖ Virulence factor-positive strains (**EPEC, EHEC/STEC, AEEC**) causing damage to intestinal mucosa resulting in diarrhea in young animals.
- ❖ **Small intestinal overgrowth** of normal E. coli, generally associated with other co-morbidities like viral or parasitic infections, causing dysbiosis leading to malabsorption and osmotic diarrhea in young animals.

Determining the significance of E. coli is **based on identification of virulence factors**, histologic exam of intestinal sections when available, and compatible clinical signs. NDSU VDL routinely performs PCR on samples from ruminants younger than 14 days, and small animals where indicated.

Antimicrobial Susceptibility Testing

In addition, review of the literature supports a change in our approach to susceptibility testing of E. coli cultured from intestinal or fecal samples. As a result we are **no longer routinely performing or recommending susceptibility testing** for the following reasons:

- ❖ Poor correlation between susceptibility data and treatment response.
- ❖ Antimicrobial breakpoints for in vitro susceptibility are known only for serum achievable concentrations, and not the treatment of intra-intestinal E. coli.
- ❖ If small intestinal overgrowth due to E. coli (a significant co-morbidity in diarrhea) or bacteremia is suspected then fecal culture is a poor representation of both sites and susceptibility data would be erroneous.

Recommended **samples for testing**:

- ❖ ≥5 grams feces
- ❖ Fresh and fixed 5-10 cm sections of each segment of small intestine (duodenum, jejunum, ileum) and one 5-10 cm section of colon.
- ❖ Swabs are not an appropriate sample.

Please contact Dr. Claire Miller for further information at 701-231-8244.

**Please see the following references for more information and current recommended treatment strategies:

- ❖ Constable, P.D. Treatment of Calf Diarrhea: Antimicrobials and Ancillary Treatments. Vet Clin Food Anim (2009) 101-120.
- ❖ Radostits. Veterinary Medicine. Elsevier (2007) pgs 865-869.

❖ Smith. Large Animal Internal Medicine. Elsevier (2015) pgs 320, 331-333.