

Diarrhea

A. History

- Provide information on herd/flock size, animal age (mandatory for bacterial culture in order to ensure testing for ETEC), numbers of animals affected, onset/duration of problem, vaccination history, and any treatment administered.

B. Selecting and submitting samples

- For best results, select **acutely affected, untreated** animals for sampling, OR submit feces from same.
- **Live**, acutely affected, untreated piglets, young ruminants (<40 kg), and rabbits may be submitted for postmortem examination. ****Please call the lab first to arrange and ensure arrival PRIOR to 15:00 h.**
Live animals must be transported humanely.
- **Rapid tissue fixation of gut sections for histology is critical, preferably <10 min after death.**
- Since intestinal lesions may be segmental, always collect **multiple** intestinal tissue samples for histology, **preferably 3 segments each of ileum and jejunum**, and one each of duodenum, cecum, colon and stomach. Partially snip open one end of 1-2 cm gut sections with scissors to expose mucosa prior to immersion in formalin.
- Please request **specific tests**, and submit **separate tissue samples**, in separate labeled Whirl-Pak bags, for each lab section and test requested. Alternatively, ask for pathologist to select tests as appropriate.

C. Samples required

Swine enteritis

Lab	Tests	Specimen type / volume Collection protocol
Bacteriology	<ul style="list-style-type: none">• Bacterial culture, fecal, porcine (cultsfe) – animal age required	<ul style="list-style-type: none">• feces, small and large intestine, mesenteric lymph node
	<ul style="list-style-type: none">• <i>Brachyspira</i> PCR porcine panel (brpcr)<ul style="list-style-type: none">○ <i>B. hyodysenteriae</i>○ <i>B. pilisicoli</i>○ <i>B. hampsonii</i> clades I and II	<ul style="list-style-type: none">• feces, oral fluid, large intestine (colon preferred)
	<ul style="list-style-type: none">• <i>C. difficile</i> culture, fecal (cdiff)• <i>C. difficile</i> toxins A&B ELISA (clodf)	<ul style="list-style-type: none">• feces or intestinal content (colon)

Lab	Tests	Specimen type / volume Collection protocol
Histology	<ul style="list-style-type: none"> Histology food (hist) Immunohistochemistry is available on formalin-fixed tissues for TGEV, PCV-2, <i>Lawsonia</i> 	Formalin fixed: <ul style="list-style-type: none"> esophagus, stomach, mesenteric lymph node, duodenum, jejunum, ileum with Peyer's patch, cecum, colon including any area with gross lesions remember to collect multiple sections from jejunum and ileum Routine tissues (filtering organs): <ul style="list-style-type: none"> kidney, liver, lung, spleen
Parasitology	<ul style="list-style-type: none"> Fecal flotation (fflot) – optional, histology can be diagnostic for coccidia 	<ul style="list-style-type: none"> feces (golf ball volume)
Serology	<ul style="list-style-type: none"> TGEV differentiating antibody ELISA (pcve2) 	<ul style="list-style-type: none"> sera from dam, surviving litter/herd mates
Virology	<ul style="list-style-type: none"> Coronaviruses TGEV, PEDV, PDCoV triplex PCR (pcovpcr) 	<ul style="list-style-type: none"> rectal swabs in virus transport medium, small intestine
	<ul style="list-style-type: none"> Rotavirus A,B,C PCR (rotapcr) 	<ul style="list-style-type: none"> feces, small intestine
	<ul style="list-style-type: none"> PCV-1,2,3 PCR (pcv123) 	

Bovine enteritis

Lab	Tests	Specimen type / volume Collection protocol
Bovine neonatal enteric panel	Includes testing for: (bentpnl) <ul style="list-style-type: none"> bovine coronavirus PCR / rotavirus group A and B sucrose wet mount bacterial culture 	<ul style="list-style-type: none"> feces – split into 3 separate sterile vials for distribution to the lab sections, if done at AHL an extra splitting charge will be applied
Bacteriology	<ul style="list-style-type: none"> Culture, food animal (cultf) – animal age required 	<ul style="list-style-type: none"> feces, large and small intestine, mesenteric lymph node, any other tissues with visible lesions
	<ul style="list-style-type: none"> <i>Mycobacterium paratuberculosis</i> (Johne's disease) PCR (jpcr) 	<ul style="list-style-type: none"> feces, ileum, mesenteric lymph nodes
	<ul style="list-style-type: none"> <i>E. coli</i>, ETEC food animal – genotyping (ecolf) <i>E. coli</i>, VTEC food animal – genotyping (vtecf) 	<ul style="list-style-type: none"> Feces, intestine
Histology	<ul style="list-style-type: none"> Histology, food animal (hist) Immunohistochemistry is available on formalin-fixed tissues for BVDV, BCV, bovine rotavirus – note that BVDV IHC is NOT available for routine PI screening 	<ul style="list-style-type: none"> Formalin fixed: esophagus, forestomachs, abomasum, mesenteric lymph node, duodenum, jejunum, ileum with Peyer's patch, spiral colon and cecum, including any area with gross lesions

Lab	Tests	Specimen type / volume Collection protocol
		<ul style="list-style-type: none"> Also include routine tissues: e.g. filtering organs liver, kidney, spleen, lung Remember to collect multiple sections from jejunum and ileum
Molecular Biology	<ul style="list-style-type: none"> <i>Cryptosporidium</i> PCR (crypto) 	<ul style="list-style-type: none"> feces
Parasitology	<ul style="list-style-type: none"> Sucrose wet mount (sucwt) – <i>Cryptosporidium</i> Fecal flotation (fflot) – coccidia, gastrointestinal nematodes 	<ul style="list-style-type: none"> feces
Serology	<ul style="list-style-type: none"> BCV VN (bcv) BVDV type 1 NADL VN (bvdn) BVDV type 1 Singer VN (bvds) BVDV type 2 NVSL VN (bvd2) 	<ul style="list-style-type: none"> paired sera
Virology	<ul style="list-style-type: none"> BVDV PCR (bvdr) For further details of BVDV testing, see LabNote 1 – Summary of bovine viral diarrhea virus (BVDV) testing at the AHL 	<ul style="list-style-type: none"> EDTA blood for acute BVD serum for PI tissue with lesion, feces
	<ul style="list-style-type: none"> Rotavirus A and B PCR, Coronavirus PCR (rocopcr) 	<ul style="list-style-type: none"> feces, ileum, spiral colon

Sheep/goat enteritis

Lab	Tests	Specimen type / volume Collection protocol
Bacteriology	<ul style="list-style-type: none"> Culture, food animal (cultf) – animal age required 	<ul style="list-style-type: none"> feces, large and small intestine
	<ul style="list-style-type: none"> <i>Clostridium perfringens</i> type D enterotoxemia culture and PCR genotyping (cperf) 	<ul style="list-style-type: none"> feces or intestine
	<ul style="list-style-type: none"> <i>Mycobacterium paratuberculosis</i> (Johne's disease) PCR (jpcr) 	<ul style="list-style-type: none"> feces, ileum, mesenteric lymph nodes
Histology	<ul style="list-style-type: none"> Histology, food animal (hist) Immunohistochemistry is available on formalin-fixed tissues for BVDV, BCV, bovine rotavirus – note that BVDV IHC is NOT available for routine PI screening 	<ul style="list-style-type: none"> Formalin fixed: esophagus, forestomachs, abomasum, mesenteric lymph node, duodenum, jejunum, ileum with Peyer's patch, spiral colon and cecum, including any area with gross lesions Also include routine tissues: e.g. filtering organs liver, kidney, spleen, lung Remember to collect multiple sections from jejunum and ileum
Molecular Biology	<ul style="list-style-type: none"> <i>Cryptosporidium</i> PCR (crypto) 	<ul style="list-style-type: none"> feces

Lab	Tests	Specimen type / volume Collection protocol
Parasitology	<ul style="list-style-type: none"> Sucrose wet mount (sucwt) – <i>Cryptosporidium</i> Fecal flotation (fflot) – coccidia, gastrointestinal nematodes 	<ul style="list-style-type: none"> feces
Serology	<ul style="list-style-type: none"> Johne's disease AGID (xjoha) 	<ul style="list-style-type: none"> serum
Virology	<ul style="list-style-type: none"> Rotavirus A and B PCR, Coronavirus PCR (rocoPCR) 	<ul style="list-style-type: none"> feces, ileum, spiral colon

Dog/cat enteritis

Lab	Tests	Specimen type / volume Collection protocol
Bacteriology	<ul style="list-style-type: none"> Bacterial culture, fecal, companion/other (cultnfe) 	<ul style="list-style-type: none"> feces, small and large intestine, mesenteric lymph node swabs are not recommended as they provide little fecal material resulting in the inability to run the toxin ELISAs
	<ul style="list-style-type: none"> <i>C. difficile</i> toxin ELISA (clodn) 	<ul style="list-style-type: none"> feces or intestinal content
	<ul style="list-style-type: none"> Bacterial culture, anaerobic, companion/other (ancun) 	
Histology	<ul style="list-style-type: none"> Histopathology, companion/other (histcm3) Immunohistochemistry is available on formalin-fixed tissues for canine parvovirus, feline parvovirus (panleukopenia), canine/feline coronavirus, canine distemper virus 	<p>Formalin fixed:</p> <ul style="list-style-type: none"> esophagus, stomach, mesenteric lymph node, duodenum, jejunum, ileum with Peyer's patch, cecum, colon including any area with gross lesions remember to collect multiple sections from jejunum and ileum <p>Routine tissues (filtering organs):</p> <ul style="list-style-type: none"> kidney, liver, lung, spleen
Molecular Biology	<ul style="list-style-type: none"> <i>Tritrichomonas fetus</i> PCR (tfPCR) <i>Giardia duodenalis</i> genotyping (ggPCR) <i>Toxoplasma gondii</i> PCR (toxopcr) 	<ul style="list-style-type: none"> feces
Parasitology	<ul style="list-style-type: none"> Fecal flotation (flotn) <i>Tritrichomonas fetus</i> culture (tfCF) <i>Giardia</i> antigen ELISA (gia) 	<ul style="list-style-type: none"> feces
Virology	<ul style="list-style-type: none"> Canine parvovirus 2 PCR (pv2mb) Feline parvovirus (panleukopenia PCR) (pv2mb) 	<ul style="list-style-type: none"> feces, small intestine

Rabbit enteritis

Note: Submission of **3** live, affected and untreated rabbits for postmortem examination is recommended.

Lab	Tests	Specimen type / volume Collection protocol
Bacteriology	<ul style="list-style-type: none"> Bacterial culture, aerobic and anaerobic (anculnm) <i>Clostridium spiroforme</i> smears <i>Lawsonia intracellularis</i> PCR (lapcn) 	<ul style="list-style-type: none"> ileum, cecum, feces
Histology	<ul style="list-style-type: none"> Histopathology, companion/other (histcm3) 	Formalin fixed: <ul style="list-style-type: none"> duodenum, jejunum, ileum, cecum, cecal appendix, proximal (sacculated) and distal colon including any area with gross lesions, stomach, mesenteric lymph node collect intestinal sections into small formalin containers individually labelled with the anatomic location remember to collect multiple sections from jejunum and ileum kidney, liver, lung, spleen
Parasitology	<ul style="list-style-type: none"> Fecal flotation (flotn) for coccidia 	<ul style="list-style-type: none"> feces

Equine enteritis

Lab	Tests		Specimen type / volume Collection protocol
Equine foal diarrhea PCR panel (fdpcrp) <ul style="list-style-type: none"> for horses <1 year of age 	Includes testing for: <ul style="list-style-type: none"> <i>Salmonella</i> spp. <i>C. perfringens</i> enterotoxin <i>C. perfringens</i> beta-2 toxin <i>C. perfringens</i> netF toxin <i>C. difficile</i> toxin B 	<ul style="list-style-type: none"> <i>Lawsonia intracellularis</i> <i>Neorickettsia risticii</i> <i>N. findlayensis</i> <i>Rhodococcus equi</i> Equine coronavirus, Equine rotavirus 	<ul style="list-style-type: none"> feces – split into 3 separate sterile vials for distribution to the lab sections, if done at AHL an extra splitting charge will be applied
Equine adult diarrhea PCR panel (adpcrp) <ul style="list-style-type: none"> for adult horses >1 year of age 	Includes testing for: <ul style="list-style-type: none"> <i>Salmonella</i> spp. <i>C. perfringens</i> enterotoxin <i>C. difficile</i> toxin B Equine coronavirus 	<ul style="list-style-type: none"> <i>Neorickettsia risticii</i> <i>N. findlayensis</i> 	<ul style="list-style-type: none"> feces – split into 3 separate sterile vials for distribution to the lab sections, if done at AHL an extra splitting charge will be applied
Bacteriology	<ul style="list-style-type: none"> Equine fecal culture (cultnf1) <i>C. difficile</i> toxins A&B ELISA (clodn) 	<ul style="list-style-type: none"> <i>Lawsonia intracellularis</i> PCR (lapcn) 	<ul style="list-style-type: none"> feces, large & small intestine, mesenteric lymph node Swabs are not recommended as they do not provide enough fecal material to run the toxin ELISAs
Histology	<ul style="list-style-type: none"> Histopathology (histcm3) 		Formalin fixed: <ul style="list-style-type: none"> any area with gross lesions collect multiple sections from jejunum and ileum filtering organs: kidney, liver, lung, spleen

Lab	Tests		Specimen type / volume Collection protocol
Molecular biology	<ul style="list-style-type: none"> • Potomac horse fever PCR (phfpc) 		<ul style="list-style-type: none"> • feces, blood
Parasitology	<ul style="list-style-type: none"> • Fecal egg count – McMaster (fecm) 		<ul style="list-style-type: none"> • feces
Virology	<ul style="list-style-type: none"> • Rotavirus/coronavirus PCR (rocopcr) 		<ul style="list-style-type: none"> • feces, colon