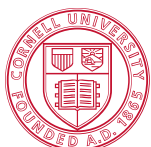


BOVINE DIAGNOSTIC PLANS/PANELS



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The following diagnostic plans have been developed primarily as an **educational** tool to assist the veterinarian in designing a complete, although not exhaustive, diagnostic strategy. To encourage veterinarians to select only the tests that are deemed clinically appropriate in each situation, the price of the diagnostic plan is not discounted from the sum of the individual test costs. **Superscript numbers match the individual tests to the sample needed.** For the test groupings labeled as panels, there may be a discounted price versus the costs of the individual tests. Diagnostic plans and panels can be requested by writing the complete name as the test request. If appropriate samples are included all tests will be performed.

DIAGNOSTIC PLAN/PANEL	TESTS PERFORMED	PRICES	SAMPLES NEEDED
Bovine Abortion Fetal Tissue Diagnostic Plan	(3) Aerobic bacterial cultures ¹ Listeria included (1 sensitivity included); Bovine Herpesvirus-1 (Infectious Bovine Rhinotracheitis) FA ² ; Bovine Virus Diarrhea Virus (BVDV) Antigen Capture ELISA (ACE) ³ ; Bovine Virus Diarrhea Virus (BVDV) FA ⁴ ; Bovine Virus Diarrhea Virus (BVDV) SN, Type1 ⁵ ; Campylobacter fetus (Vibrio) FA ⁶ ; Histopathology ⁷ ; Field Necropsy Surcharge ⁷ ; (2) Leptospira PCRs ⁸ ; Neospora IFA ⁹ ; Virus isolation ¹⁰	\$516.50/fetus Testing may qualify for N.Y State contract case subsidy.	Fresh tissue ^{1,2,3,4,6,8,10} : lung, placenta including cotyledons, abomasal contents, kidney, liver, heart, adrenal, skin, heart blood ^{5,9} in sterile red top tube AND Formalin fixed tissue ⁷ : placenta, liver, lung, brain, adrenal, heart, thymus, small intestine, kidney, fetal skin. SHIP FRESH TISSUE CHILLED AND PROTECT FIXED TISSUE FROM FREEZING. Kit is available. See Abortion Kit, Ruminant for more complete instructions. If full necropsy desired, see Necropsy Testing.
Bovine Abortion Serology Panel + Selenium	Bovine Virus Diarrhea Virus (BVDV) SN, Type 1 ¹ ; Brucella Fluorescence Polarization Assay ² ; Infectious Bovine Rhinotracheitis (IBR) (BHV-1) kinetic ELISA ³ ; Leptospira MAT, 5 standard serovars ⁴ ; Neospora IFA ⁵ ; Selenium, whole blood ⁶	\$89.50 single \$143.50 paired (1 selenium) Testing may qualify for N.Y State contract case subsidy.	Maternal serum ^{1,2,3,4,5} (separated) and maternal EDTA whole blood ⁶ (LTT). SHIP CHILLED. When acute and convalescent samples are/will be collected, for most serology assays they should always be tested in parallel, and paired results interpreted. If acute samples are submitted alone please indicated if all tests should be performed. If second, convalescent samples are later submitted, tests on both samples will be run in parallel and fees for both samples will be charged. To avoid testing acute samples twice, hold and submit with convalescent samples. If convalescent samples will not be collected, or when infectious abortion is strongly suspected due to history, immediate testing of acute sample may be warranted.

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Bovine Chronic Ill Thrift / Weight Loss Plan	BVDV Antigen Capture ELISA¹ ; Cholesterol² ; Fecal Float³ ; Fibrinogen (heat-precipitated)⁴ ; Hemogram, Large Animal⁵ ; Johne's fecal PCR⁶ ; Large Animal Chemistry⁷ ; Ref: Anaplasma marginale PCR⁸ ; Ref: Mycoplasma PCR⁹ ; Selenium, whole blood¹⁰ ; Vitamin E in serum¹¹	\$398.75 (out of state); \$381.00 (NY State) Testing may qualify for N.Y State contract case subsidy.	
Bovine Diarrhea, Adult (Acute) Diagnostic Plan	Bovine Coronavirus PCR¹ ; Bovine Virus Diarrhea Virus (BVDV) PCR² ; Fecal quantitative³ ; Johne's fecal PCR⁴ ; Salmonella culture⁵ (no sensitivity included)	\$190.50 (out of state); \$172.75 (NY State) Testing may qualify for N.Y State contract case subsidy.	Fresh Feces^{1,3,4,5} in leak-proof container (20 g) and EDTA whole blood² (LTT) . One fecal sample⁵ (1 g, fill to line on container but do not overfill) can be put in ParaPak [®] transport media to assist with Salmonella recovery. ParaPak[®] transport media is available. SHIP CHILLED, EXCEPT FOR PARAPAK[®] WHICH SHOULD BE KEPT AT ROOM TEMPERATURE.
Bovine Diarrhea, Adult (Chronic) Diagnostic Plan	Bovine Virus Diarrhea Virus (BVDV) Antigen Capture ELISA (ACE)¹ ; Fecal quantitative² ; Johne's fecal PCR³ ; Salmonella culture⁴ (no sensitivity included)	\$89.25 (out of state); \$71.50 (NY State) Testing may qualify for N.Y State contract case subsidy.	Fresh feces^{2,3,4} in leak-proof container (20 g) and serum (separated)¹ or ear notch¹ . One fecal sample⁴ (1 g, fill to line on container but do not overfill) can be put in ParaPak [®] transport media to assist with Salmonella recovery (call shipping 607.253.3935 to order these). SHIP CHILLED, EXCEPT FOR PARAPAK[®] WHICH SHOULD BE KEPT AT ROOM TEMPERATURE.
Bovine Diarrhea, Calf (Acute) Diagnostic Plan	Aerobic bacterial culture¹ (1 sensitivity included); Anaerobic bacterial culture² ; Beta Coronavirus PCR³ ; Bovine Virus Diarrhea Virus (BVDV) Antigen Capture ELISA (ACE)⁴ ; Clostridium perfringens Enterotoxin⁵ ; Fecal quantitative⁶ if ≥ 3 days old; Histopathology⁷ ; Field Necropsy Surcharge⁷ ; Rotavirus Antigen	\$292.00 (ante mortem samples) \$427.75 (full set of necropsy samples)	Ante mortem samples: Fresh feces^{1,3,6,8,9} in leak-proof container (20 g) and frozen feces⁵ (5 g), fecal swab^{1,2,9} placed in anaerobic transport media (BBL[™] Port-a-cul[™] or Anaerobic Systems ATM), EDTA whole blood¹¹ (LTT), and fresh ear notch⁴ . One fecal sample⁹ (1 g, fill to line on container but do not overfill) can be put in ParaPak [®] transport media to assist with Salmonella recovery

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	<p>Detection, Group A⁸; Salmonella culture⁹; (3) Virus FAs¹⁰ [Bovine Rotavirus, Bovine Coronavirus, Bovine Virus Diarrhea Virus (BVDV)] on intestinal tissue; Bovine Virus Diarrhea Virus (BVDV) PCR¹¹</p> <p>May also consider Cryptosporidium ELISA on calves 3-30 days and Giardia ELISA on calves from 7 days to 6 months. Both of these are performed on fecal samples. Also selenium on an EDTA whole blood sample or liver may be appropriate in some situations.</p> <p>May want to consider Clostridium perfringens genotyping PCR for identification of the genes for specific toxins if Clostridium perfringens isolated. If E. coli is isolated you may want to consider Escherichia coli genotyping PCR to further identify which genes for which adhesins and toxins are present.</p>	Testing may qualify for N.Y State contract case subsidy.	<p>(BBL™ Port-a-cul™ and ParaPak® transport media are available).</p> <p>SHIP CHILLED AND KEEP FROZEN SAMPLES FROZEN EXCEPT FOR ANAEROBIC TRANSPORT SYSTEMS AND PARAPAK® WHICH SHOULD BE KEPT AT ROOM TEMPERATURE.</p> <p>Necropsy samples: Tied off loop of bowel with contents^{1,2,5,9,10,11} (frozen), +/- intestinal swab^{1,2,9} placed in anaerobic transport media (BBL™ Port-a-cul™ or Anaerobic Systems ATM), tied off loop of bowel with contents^{1,9,10,11} (fresh), fresh feces^{1,6,9} in leak-proof container (10 g), fresh ear notch⁴, full set of tissues⁷ (including multiple sections of intestinal tract) placed in formalin. SHIP CHILLED AND KEEP FROZEN SAMPLES FROZEN EXCEPT FOR ANAEROBIC TRANSPORT SYSTEMS WHICH SHOULD BE KEPT AT ROOM TEMPERATURE. PROTECT FIXED TISSUE FROM FREEZING.</p> <p>To rule in/out acute BVD infection in a live calf, include EDTA whole blood for BVD PCR as the BVD Antigen Capture ELISA test on ear notch samples will only reliably detect BVD Persistently Infected animals. For post-mortem submissions, BVD FA on bowel tissue and BVD ACE on ear notch together will rule out acute and PI infection. Alternatively BVD PCR on fresh bowel can be added if ear notch has not been collected.</p>
<p>Bovine Neurologic Diagnostic Plan</p> <p>PLEASE STRONGLY CONSIDER RABIES TESTING AT YOUR STATE HEALTH DEPARTMENT</p>	<p>Aerobic bacterial culture¹; Histopathology²; Field Necropsy Surcharge²; Lead, blood or Lead, tissue³; Listeria culture⁴</p> <p>May also want to consider Cerebrospinal Fluid Cytology which requires CSF in EDTA tube (LTT) and (2) air dried slides of CSF. Protect slides from formalin exposure. If salt toxicity is a possibility may want to consider mineral panel on fresh brain.</p>	\$229.50	<p>CSF¹ sample taken using sterile technique and placed in sterile red top tube +/- (1) swab¹ inoculated with CSF, OR (1) swab¹ of meninges prior to contamination and placed in aerobic transport media (Amies with charcoal), fresh brain (preferably brainstem)⁴ placed in sterile container, EDTA or Heparin whole blood³ (LTT or GTT) or fresh liver³ in sterile container, full set of fixed tissues² placed in formalin, including multiple sections of brain and spinal cord. SHIP CHILLED AND PROTECT FIXED TISSUE FROM FREEZING. PLEASE INDICATE IF RABIES TESTING IS PENDING. See Tissues for</p>

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	If whole head is submitted a rabies brain extraction fee will be applied. Please submit completed NYS rabies specimen history form and write out clear instructions on what additional diagnostic tests should be performed.		Rabies Diagnosis for photos of brain samples needed for rabies testing.
Bovine Pinkey Diagnostic Plan	Aerobic bacterial culture ¹ (1 sensitivity included); Bovine Herpesvirus-1 (BHV-1) (Infectious Bovine Rhinotracheitis) FA ² ; Mycoplasma culture ³	\$120.00 Testing may qualify for N.Y State contract case subsidy.	Conjunctival swab ^{1,3} in aerobic transport media (Amies w/out charcoal) and conjunctival scraping ² on glass slide and air dried. SHIP SWAB CHILLED AND SLIDE AT ROOM TEMPERATURE.
Bovine Reproduction Bacteriology Panel A (formerly "Reproductive Bacteriology Cultures, Panel 4")	Aerobic bacterial culture ¹ ; Mycoplasma culture ² ; Ureaplasma culture ³ ; (no sensitivities included)	\$94.00 Testing may qualify for N.Y State contract case subsidy.	Uterine swab ^{1,2,3} in aerobic transport media (Amies w/out charcoal) or semen, urethral, or preputial sample ^{1,2,3} in sterile container. SHIP CHILLED. This panel often combined with panel B below.
Bovine Reproduction Bacteriology Panel B (formerly "Reproductive Bacteriology Cultures, Panel 5")	Campylobacter fetus (Vibrio) FA ¹ ; Tritrichomonas culture ²	\$29.50	Special Lactated Ringers vial ¹ and InPouch™ TF culture system ² inoculated with cervical mucus or preputial scraping . KIT AND INSTRUCTIONS AVAILABLE. Bulls should be sexually rested for three weeks to maximize recovery. CONTACT LAB TO SCHEDULE SUBMISSION. SHIP LACTATED RINGERS VIAL CHILLED AND INPOUCH™ TF AT ROOM TEMPERATURE. This panel often combined with panel A above.

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Bovine Respiratory (Acute) Diagnostic Plan	<p>Aerobic bacterial culture¹ (1 sensitivity included); Bovine Coronavirus PCR²; Cytology³; Histopathology⁴; Field Necropsy Surcharge⁴; Mycoplasma culture⁵; (2) Virus FAs⁶: [Bovine Virus Diarrhea Virus (BVDV), Bovine Herpesvirus-1 (BHV-1) (IBR)]; Virus isolation⁷; Bovine Syncytial Virus PCR⁸</p> <p>Testing for evidence of lungworms, quantitative fecal may be warranted depending on season. Also selenium on an EDTA whole blood sample or liver and vitamin E on a serum sample (separated) may be appropriate in some situations. Paired acute and convalescent serum samples for BVDV SN, Type 1, IBR kELISA , and BRSV SN may be warranted in acute disease episodes.</p>	<p>\$334.50 (ante mortem samples)</p> <p>\$411.00 (full set of necropsy samples)</p> <p>Testing may qualify for N.Y State contract case subsidy.</p>	<p>Ante mortem samples: transtracheal wash (TTW) (preferred sample) or bronchial alveolar lavage (BAL) fluid in RTT^{1,2,5,6,7,8} (alternatively can use viral transport media), and EDTA tube³(LTT), (2) air dried slides³ of fluid, and (1) swab inoculated with sample^{1,5} and placed in aerobic transport media (Amies w/o charcoal). Nasal or pharyngeal swabs^{2,7,8} in viral transport media or a RTT with 0.5 ml sterile saline AND also in aerobic transport media (Amies w/o charcoal)^{1,5}. SHIP CHILLED EXCEPT FOR SLIDES WHICH SHOULD BE AT ROOM TEMPERATURE.</p> <p>TTW fluid is a superior sample for detection of significant bacterial pathogens causing lower airway disease. Results of nasal or pharyngeal swab cultures must be interpreted with caution as many bacterial organisms may be present as normal commensals in the upper respiratory tract. See Transtracheal wash procedure for more information. It may be helpful to collect and bank a serum sample for possible acute and convalescent serology.</p> <p>Necropsy samples: Section of fresh lung^{1,2,5,6,7} +/- (1) swab inoculated with sample^{1,5} and placed in aerobic transport media (Amies w/o charcoal) and full set of tissues⁴ placed in formalin. SHIP FRESH TISSUE AND SWABS CHILLED AND PROTECT FIXED TISSUE FROM FREEZING.</p>

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<i>Calf Management Diagnostic Plan</i>	(4) Bedding modified bacterial counts ¹ ; (8) Colostrum/milk modified bacterial counts ² ; Milk replacer/Electrolyte Osmolality ³ ; (10) Total Protein Plasma - refractometer ⁴ May also want to consider selenium on an EDTA whole blood sample in some situations.	\$421.00 Testing may qualify for N.Y State contract case subsidy.	EDTA whole blood ⁴ (LTT) on 10 calves less than one week of age; (1) 5 ml sample Milk Replacer or Electrolyte Supplement ³ , as mixed for use; (2) 5 ml samples Colostrum ² , as collected from cow; (2) 5 ml samples Colostrum ² , as fed, collected from regular feeding utensil, after routine storage, if any; (2) 5 ml samples Milk/milk replacer ² , as collected or mixed; (2) 5 ml samples Milk/milk replacer ² , as fed, collected from regular feeding utensil, after routine storage, if any; (2) bedding samples ¹ , clean stalls ready to occupy; (2) bedding samples ¹ , stalls with calves. SHIP CHILLED.
<i>Coagulation Panel, Large Animal</i>	aPTT ; PT ; Fibrinogen (Clauss method)	\$42.50	2 ml separated citrate plasma in plastic or siliconized glass tube (blue top and then separated and transferred). SHIP CHILLED.
<i>Dermatology Diagnostic Plans</i>	Aerobic bacterial culture ¹ (1 sensitivity included); Biopsy for parasite exam ² ;	Deep lesion: \$233.00	Deep lesion: (2) fresh skin biopsies ^{1,2,3,4} in plain RTT with 0.5 ml sterile saline to keep moist (not wet) +/- swab ^{1,3} from deep in tissue placed in aerobic transport media (Amies with charcoal), multiple formalin fixed skin biopsies ⁵ . SHIP CHILLED AND PROTECT FIXED TISSUE FROM FREEZING.
<i>Deep lesion</i>	Fungal culture ³ ; Gram stain ⁴ ; Histopathology (biopsy) ⁵ ;	Testing may qualify for N.Y State contract case subsidy.	
<i>Superficial lesion</i>	Fungal culture ³ ; Gram stain ⁴ ; Histopathology (biopsy) ⁵ ; Skin scraping for ectoparasite identification ⁶ ; Cytology ⁷ All skin biopsy submissions should be accompanied by a Dermatohistopathology Submission Form . For additional guidance refer to Dermatopathology Sampling Guide .	Superficial lesion: \$213.00 Testing may qualify for N.Y State contract case subsidy.	Superficial lesion: (1) hair and skin scraping ^{3,4} for fungal culture and gram stain sent in a sealable paper envelope, (1) skin scraping ⁶ for ectoparasite identification in an escape proof, non-porous container, (2) impression smears/skin scrapings/fluid aspirates ⁷ for cytology placed on glass slides and air dried, and multiple formalin fixed skin biopsies ⁵ . No aerobic culture is included in the superficial plan. SHIP AT ROOM TEMPERATURE AND PROTECT FROM TEMPERATURE EXTREMES. PROTECT SLIDES FROM FORMALIN EXPOSURE.

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Embryo Transfer Recipient Panel	Bovine Leukosis Virus (BLV) ELISA ; Bovine Virus Diarrhea Virus (BVDV) Antigen Capture ELISA (ACE) ; Neospora IFA	\$28.00	Serum (separated). SHIP CHILLED.
Fever of Unknown Origin Diagnostic Plan	<p>(3) Blood cultures, aerobic/fungal¹ (1 sensitivity included); (3) Blood cultures, anaerobic²; Fibrinogen (heat-precipitated)³; Hemogram, routine (CBC)⁴ (examination for blood parasites included); (2) Virus isolations⁵ (nasal, whole blood)</p> <p>If case is chronic, virus isolation can be omitted if desired, see comment to right. If not previously tested a Bovine Virus Diarrhea Virus (BVDV) Antigen Capture ELISA (ACE) on serum or an ear notch and a Large animal chemistry panel on serum or heparinized plasma (separated from a green top tube) may be warranted.</p>	<p>\$335.00</p> <p>Chronic case with no virus isolation: \$265.00</p> <p>Testing may qualify for N.Y State contract case subsidy.</p>	<p>(3) inoculated aerobic/fungal blood culture bottles¹, (3) inoculated anaerobic blood culture bottles², nasal swab⁵ in 0.5 ml sterile saline to keep moist (not wet), (2) tubes EDTA whole blood^{3,4,5} (LTT), and (2) air dried blood smears⁴. SHIP CHILLED EXCEPT FOR BLOOD CULTURE BOTTLES AND SLIDES WHICH ARE SHIPPED AT ROOM TEMPERATURE. See Blood Culture Technique for more information. To order blood culture bottles go to shipping services or call 607.253.3935. It may be helpful to collect and bank a serum sample for possible acute and convalescent serology.</p> <p>This diagnostic plan is designed to detect a broad spectrum of systemic bacterial, viral, and some blood parasite causes of acute fever of unknown origin, as well as certain inflammatory changes which may assist in determining the underlying problems. Viral causes of illness are best detected acutely and most are unlikely to be detected in a patient with a chronic fever of unknown origin. This plan is intended to be used as an adjunct to targeted, disease-specific testing appropriate to the species, clinical history and geographic location or conditions. See Small Animal Internal Medicine, 5th Edition, 2014, Nelson RW and Couto CG; Chapter 88: Fever of Unknown Origin, pages 1279-1282 for other ideas of testing.</p>
Large Animal Basic Workup	Fibrinogen (heat-precipitated) ¹ ; Hemogram, routine (CBC) ² ; Large animal chemistry panel ³	\$105.00	EDTA whole blood ^{1,2} (LTT), (2) air dried blood smears ² , and serum ³ (separated). SHIP CHILLED.

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<u>Large Animal Liver Panel</u>	AST ; SDH ; GGT ; GLDH ; Total/Direct/Indirect Bilirubin ; Total Protein ; Albumin ; Globulin ; A/G Ratio ; CK ; Triglycerides	\$25.00	Serum (separated) or heparinized plasma (separated from a green top tube). SHIP CHILLED
<u>Large Animal Renal Panel</u>	Na ; K ; Cl ; Bicarb ; Anion gap ; Urea ; Creatinine ; Albumin ; Ca ; P	\$28.00	Serum (separated) or heparinized plasma (separated from a green top tube). SHIP CHILLED
<u>Metabolic Profile Test Panel</u>	Albumin ; Aspartate Aminotransferase ; Beta-Hydroxybutyrate (BHBA) ; Non-Esterified Fatty Acid (NEFA) ; Urea Nitrogen	\$30.50	Serum (separated), do not use serum separator tubes. Serum can be frozen and placed in chest freezer that is not a frost-free freezer to minimize the freeze-thaw cycles. SHIP CHILLED. For BHBA and NEFA testing on the herd level, it is recommended to sample 12 animals per herd from cows that are 3-14 days in milk. See Appendix A for more information on sampling and interpretation.
<u>Transition Cow Energy Panel</u>	Beta-Hydroxybutyrate (BHBA) ; Non-Esterified Fatty Acid (NEFA)	\$22.00	Serum (separated), do not use serum separator tubes. Serum can be frozen and placed in chest freezer that is not a frost-free freezer to minimize the freeze-thaw cycles. SHIP CHILLED For BHBA and NEFA testing on the herd level, it is recommended to sample 12 animals per herd from cows that are 3-14 days in milk. See Appendix A for more information on sampling and interpretation. If negative energy balance in prepartum cows is the primary concern you may want to consider sampling 12 prefresh animals (2-14 days precalving) and only performing NEFAs.

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<i>Transition Cow Management Diagnostic Plan (Transition Cow Energy Panel + Selenium + Vitamin E)</i>	Beta-Hydroxybutyrate (BHBA) ¹ ; Non-Esterified Fatty Acid (NEFA) ² ; Selenium, whole blood ³ ; Vitamin E ⁴	\$80.00	<p>Serum^{1,2,4} (separated), do not use serum separator tubes and EDTA whole blood³ (LTT). SHIP CHILLED.</p> <p>For BHBA and NEFA testing on the herd level, it is recommended to sample 12 animals per herd from cows that are 3-14 days in milk. See Appendix A for more information on sampling and interpretation.</p> <p>If negative energy balance in prepartum cows is the primary concern you may want to consider sampling 12 prefresh animals (2-14 days precalving) and only performing NEFAs.</p> <p>In some herd situations there may be value in considering testing on the herd level for subclinical hypocalcemia and this could be done by sampling 12 fresh animals (0-2 days) and performing calcium only.</p>
<i>Virus Isolation, IBR/BVD Semen Panel</i>	Virus Isolation IBR/BVD	\$93.00	Semen in sterile container. SHIP CHILLED.

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