

## Marine Ecosystem Health Diagnostic and Surveillance Laboratory

VM: One Health Institute and Wildlife Health Center  
 VM3B, 1089 Veterinary Medicine Dr  
 University of California  
 Davis, CA 95616

Phone: (530) 754 - 7953

Fax: (530) 752 - 3318

Email: [marlab@ucdavis.edu](mailto:marlab@ucdavis.edu)

<https://ohi.vetmed.ucdavis.edu/ohi-laboratory/submit-samples>

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
Acid fast stain	Mycobacterium, Nocardia, Rhodococcus, Cryptosporidium oocysts	VMTH Microbiology	Microbial Culture	N/A	\$28.35	< 1 week	
<b>Adenovirus</b> PCR	Degenerate primers target polymerase gene fragment	MEHDS	Tissue with lesion, swab of lesion, rectal swab, oral swab, whole blood	Frozen at -80C, ship on dry ice	\$66.65	2 weeks	If positive total cost is \$122.73 with sequencing
<b>Bacterial culture</b>							
Aerobic culture & ID		VMTH Microbiology	1) Swab of skin, nasal, ear, eye, vaginal, oral, trachea, pharynx, rectal, draining tract, lesion in Amies transport media without charcoal; 2) Joint fluid, CSF, urine, aspirates collected aseptically into a sterile red top tube or sterile syringe without needle	Ship on cold pack	\$79.00	1 week	
Anaerobic culture & ID		VMTH Microbiology	1) Tissue biopsies, abscess, fluids, bronchial wash, swabs into anaerobic transport 2) Necropsy tissues aseptically into a ziplock, whirlpak or in anaerobic transport media	Ship on cold pack	\$66.00	1 week	Generally not done without aerobic culture

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Bacterial culture cont.</b>							
Aerobic blood culture & ID		VMTH Microbiology	Blood collected aseptically, minimum of three bottles either: 3ml blood into 20ml broth or 10ml blood in 70ml bottles	Ship on cold pack	\$102.00, \$25 ea additional bottle	1 week	Includes susceptibility, up to 3 collections
Aerobic & anaerobic culture & ID		VMTH Microbiology	1) Tissue biopsies, abscess, fluids, bronchial wash, lesions, swabs into anaerobic transport medium and Amies transport medium without charcoal; 2) Necropsy tissues taken aseptically and: place into a ziplock or whirlpak, one tissue per bag or into anaerobic transport medium and Amies transport medium without charcoal, tie off gut loops for enterotoxemia	Ship on cold pack	\$162.60	2 weeks	
Aerobic & anaerobic blood culture & ID		VMTH Microbiology	Blood collected aseptically, minimum of three bottles either: 3ml blood into 20ml broth or 10ml blood in 70ml bottles, DO NOT pass air into bottle for anaerobic culture	Ship on cold pack	\$167.05, \$25 ea additional bottle	2 weeks	Includes aerobic susceptibility, up to 3 collections
Antimicrobial susceptibility	Serum MIC aerobe	VMTH Microbiology	Microbial Culture	N/A	\$41.00	1 week	Contact Lab if greater than 10 animals; Additional \$10 if requires blood

	Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Bacterial culture cont.</b>	Gram stain		VMTH Microbiology	Microbial Culture	N/A	\$29.00	< 1 week	
	Normal Flora Study		VMTH Microbiology	1) Swab of skin, nasal, ear, eye, vaginal, oral, trachea, pharynx in Amies transport media without charcoal; 2) Rectal swab in Cary Blair media	Ship on cold pack	Contact Lab	Varies	
	Partial DNA sequencing ID		VMTH Microbiology	Microbial Culture	N/A	\$101.00	2 weeks	
<b>Brucella spp.</b>	Serology	Card Agglutination	CAHFS	Serum	Ship on cold pack	\$4.75		
	PCR	Primers target gene encoding the IS711 insertion sequence	MEHDS	Tissue with lesion, swab of lesion, rectal swab	Frozen at -80C, ship on dry ice	\$33.33	2 weeks	If positive total cost is \$89.40 with sequencing
<b>Calicivirus</b>	RT-PCR	Primers targets a conserved region of RNA-dependent RNA polymerase (3D) gene	MEHDS	Vesicular fluid, vesicular swab, skin biopsy, other tissue with lesions	Frozen at -80C, ship on dry ice	First sample \$68.45; each additional sample \$31.97	2 weeks	If positive total cost is \$124.53 (first samples) or \$88.04 (each additional sample) with sequencing
<b>Campylobacter spp.</b>	Fecal culture		VMTH Microbiology	1) 3 Fecal swabs in Cary Blair medium; 2) at least 10g or 10ml feces in C & S culture para pak vials	Ship on cold pack	\$70.00	1 week	
	Molecular characterization	Animal samples	Conrad	Microbial Culture (animal samples)	N/A			Contact Lab
<b>Clostridium perfringens</b>	ELISA	Enterotoxin A	VMTH Microbiology	0.5ml Serum minimum	Cold pack if fresh, Frozen on dry ice	\$48.00	< 1 week	
<b>Clostridium difficile</b>	ELISA	Antigen and Toxin A and B	VMTH Microbiology	0.5ml Serum minimum	Cold pack if fresh, Frozen on dry ice	\$62.00	< 1 week	
<b>Coccidioides immitis</b>	CF	Coccidioidal IgM ("precipitin")	VMTH Microbiology	3ml Serum minimum	Cold pack if fresh, Frozen on dry ice	\$49.00	2 weeks	

	Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Cryptococcus neoformans</b>	India Ink stain		VMTH Microbiology	Microbial Culture	N/A	\$29.00	< 1 week	
<b>Cryptosporidium</b>	DNA characterization	Includes fecal floatation, extraction, amplification and sequence analysis	Conrad	Feces (10g) positive on DFA	N/A	First sample \$260.00; each additional sample \$130.00	Varies	
	DNA characterization with IMS concentration	(Animal samples) Includes fecal floatation, extraction, amplification, sequence analysis with increased sensitivity and DNA quality	Conrad	Feces (10g) positive on DFA	N/A	\$300.00	Varies	
	DFA		VMTH Parasitology	10g or 10ml fresh feces	10g or 10ml fresh feces	\$62.00	2 weeks	Positive samples can be sent to W. Miller at the Conrad Lab for characterization
<b>E. coli spp.</b>	Molecular characterization	Animal samples	Conrad	Microbial Culture (animal samples)	N/A			Contact Lab
<b>Fecal culture</b>	Fecal culture - single organism	eg. Salmonella only	VMTH Microbiology	1) 3 Fecal swabs in Cary Blair medium; 2) at least 10g or 10ml feces in C & S culture para pak vials	Ship on cold pack	\$70.00	1 week	
	Fecal culture - combination of 2 organisms	eg. Salmonella & Campylobacter	VMTH Microbiology	1) 3 Fecal swabs in Cary Blair medium; 2) 10g or 10ml feces in C & S culture para pak vials	Ship on cold pack	\$102.00	1 week	

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments	
<b>Fecal culture cont.</b>	Sea otter enteric protocol	Includes Salmonella, Campylobacter, Vibrio, E.coli 0157, C. perfringens, C. difficile, S. Bovis/ Equinus complex	VMTH Microbiology	1) 3 Fecal swabs in Cary Blair medium; 2) at least 10g or 10ml feces in C & S culture para pak vials	Ship on cold pack	\$109.00	1 week	
<b>Fungus</b>	KOH prep	VMTH Microbiology	Fungal smear	Ship on cold pack	\$32.00	< 1 week		
	Fungal Culture and ID	VMTH Microbiology	1) Swab of skin, nasal, ear, eye, vaginal, oral, trachea, pharynx, rectal, lesion in sterile tube; 2) Joint fluid, CSF, urine, aspirates collected aseptically into a sterile red top tube or sterile syringe without needle; 3) Tissue biopsies, fluids, abscess, bronchial wash, lesions in sterile tube; 4) Necropsy tissues taken aseptically into sterile whirlpak, one per bag	Ship on cold pack	\$69.00	3 weeks		
	Antimicrobial susceptibility	MIC yeast	VMTH Microbiology	Fungal Culture	N/A	\$253.15	< 1 week	
<b>Giardia</b>	DFA	VMTH Parasitology	10g or 10ml fresh feces	10g or 10ml fresh feces	\$62.00	2 weeks		
	DNA characterization	Includes fecal floatation, extraction, amplification and sequence analysis	Conrad	Feces (10g) positive on DFA	N/A	First sample \$260.00; each additional sample \$130.00	Varies	

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Giardia cont.</b>	DNA characterization with IMS concentration	Conrad	Feces (10g) positive on DFA	N/A	\$300.00	Varies	
	DFA, PCR	Conrad	Water (100ml): Clean and turbid water, estuarine water, ocean water, bivalves, sewage effluent and influent	Ship on cold pack		2 weeks	Contact Lab
<b>Hawaiian monk seal herpesvirus</b>	PCR	MEHDS	Tissue with lesion, swab of lesion, whole blood	Frozen at -80C, ship on dry ice	\$33.33	2 weeks	If positive total cost is \$47.99 with sequencing
<b>Influenza A</b>	RT-PCR	MEHDS	Nasal, rectal swab, tissues	Frozen at -80C, ship on dry ice	First sample \$81.99; each additional sample \$36.48	2 weeks	If positive total cost is \$138.07 (one sample) or \$92.56 (each additional sample) with sequencing
<b>Leptospirosis</b>	MAT	CAHFS	1ml Serum minimum	Cold pack if fresh, Frozen on dry ice	\$23.00	1 week	Contact lab for cost if for a research project
<b>Morbillivirus</b>	RT-PCR	MEHDS	Nasal swab, whole blood, brain, lung, tracheobronchial lymph node, spleen	Frozen at -80C, ship on dry ice	First sample \$81.99; each additional sample \$36.48	2 weeks	If positive total cost is \$138.07 (one sample) or \$92.56 (each additional sample) with sequencing

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments	
<b>Mycoplasma</b>	Culture	VMTH Microbiology	1) Fresh tissues, uterine, cervical, vaginal mucus; tracheal washing, lung, swab in Amies transport; 2) Milk	Ship on cold pack	\$26.00	1 week		
<b>Neospora</b>	IFA	Conrad	1ml Serum minimum	Cold pack if fresh, Frozen on dry ice	Screen at 1:40 \$47.19; Additional \$47.19/sample for endpoint titer	2 weeks	Contact lab for potential reduced rates for Sea otter, seal, sea lion, dolphin if request screening for T. gondii, S. neurona, Neospora	
	Culture	Conrad	Fresh heart	In antibiotic saline shipped on a cold pack	\$179.96	Varies	Recommend tissue in antibiotic saline for culture	
	PCR	Conrad	Frozen brain - cerebellum and cerebrum	Frozen at -80C, ship on dry ice	First sample \$287.93; each additional sample or additional gene \$141.40	Varies	Recommend frozen tissue for PCR	
<b>Northern elephant seal herpesvirus</b>	PCR	MEHDS	Tissue with lesion, swab of lesion, nasal/oral swab, rectal swab, whole blood	Frozen at -80C, ship on dry ice	\$33.33	2 weeks	If positive total cost is \$47.99 with sequencing	
<b>Herpesvirus</b>	PCR ID	MEHDS	Degenerate primers target DNA polymerase and terminase gene fragment	Tissue with lesion, swab of lesion, nasal/oral swab, rectal swab, whole blood	Frozen at -80C, ship on dry ice	\$66.65	2 weeks	If positive total cost is \$122.73 with sequencing
<b>Novel virus</b>	VI	MEHDS	Tissue frozen at -80C or frozen at -80 C in viral transport media	Ship frozen on dry ice	\$101.28	Varies	Additional cost if PCR or EM needed for ID	

	Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
	EM		CAHFS	Positive culture or formalin fixed sections	N/A	Contact Lab	Varies	
	RT-PCR / PCR ID		MEHDS	Tissue with lesion, swab of lesion, whole blood	Frozen at -80C, ship on dry ice	\$138.07	Varies	Contact Lab Includes primer design, extraction, amplification, sequencing, phylogenetic analysis
	Next Generation Sequencing		MEHDS	Tissue with lesion, swab of lesion, whole blood	Frozen at -80C, ship on dry ice	Contact Lab	Varies	Includes library preparation, sequencing, bioinformatics
<b>Otarine herpesvirus-1</b>	PCR	Primers target DNA polymerase gene fragment	MEHDS	Vaginal/prepuce swab, whole blood, reproductive tissue, liver, other tissues	Frozen at -80C, ship on dry ice	\$33.33	2 weeks	If positive total cost is \$47.99 with sequencing
<b>Phocine herpesvirus-1</b>	ELISA	Measures antibodies to phocine herpesvirus-1	MEHDS	0.5ml Serum minimum	Cold pack if fresh, Frozen on dry ice	1 sample \$17.77, Plate batch of 18 samples \$44.43	2 weeks	Phocid seals Contact lab to test other species
	PCR	Primers target glycoprotein B gene fragment	MEHDS	Nasal/oral swab, whole blood, adrenal, liver, other tissue with lesions	Frozen at -80C, ship on dry ice	\$33.33	2 weeks	If positive total cost is \$47.99 with sequencing
<b>Protozoa</b>	Fecal ID	Fecal floatation	VMTH Parasitology	10g or 10ml fresh feces	Ship on cold pack	\$62.00	< 1 week	
<b>Parapox virus</b>	PCR	Universal parapox primer pair targets the virion envelope antigen (p42K)	MEHDS	Lesion swab, skin biopsy, whole blood	Frozen at -80C, ship on dry ice	\$66.65	2 weeks	If positive total cost is \$122.73 with sequencing



Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Poxvirus</b>  PCR	Degenerate primers target virion envelope, hemagglutinin and polymerase gene fragment	MEHDS	Tissue with lesion, swab of lesion, whole blood	Frozen at -80C, ship on dry ice	\$66.65	2 weeks	If positive total cost is \$122.73 with sequencing
<b>Salmonella spp.</b>  Fecal culture		VMTH Microbiology	1) 3 Fecal swabs in Cary Blair medium; 2) at least 10g or 10ml feces in C & S culture para pak vials	Ship on cold pack	\$70.00	1 week	
<b>Sarcocystis neurona</b>  IFA		Conrad	1ml Serum minimum	Cold pack if fresh, Frozen on dry ice	Screen at 1:40 \$47.19; Additional \$47.19/ sample for endpoint titer	2 weeks	Contact lab for potential reduced rates for Sea otter, seal, sea lion, dolphin if request screening for T. gondii, S. neurona, Neospora
 Culture		Conrad	Fresh brain - cerebellum and cerebrum	In antibiotic saline shipped on a cold pack	\$179.96	Varies	Recommend tissue in antibiotic saline for culture
 PCR	Bundle: DNA extraction, PCR, GE, Sequencing and analysis, ITS1	Conrad	Feces (10g) positive on DFA; Tissues (brain best, heart, muscle)	Frozen at -80C, ship on dry ice	First sample \$287.93; each additional sample or additional gene \$141.40	Varies	Recommend frozen tissue for PCR
<b>Other Sarcocystis spp.</b> Culture		Conrad	Fresh muscle: skeletal muscle, heart	In antibiotic saline shipped on a cold pack	\$179.96	Varies	Recommend tissue in antibiotic saline for culture

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Toxoplasma gondii</b>	IFA	Conrad	1ml Serum minimum	Cold pack if fresh, Frozen on dry ice	Screen at 1:40 \$47.19; Additional \$47.19/ sample for endpoint titer	2 weeks	Contact lab for potential reduced rates for Sea otter, seal, sea lion, dolphin if request screening for T. gondii, S. neurona, Neospora
	Culture	Conrad	Fresh brain - cerebellum and cerebrum	In antibiotic saline shipped on a cold pack	\$179.96	Varies	Recommend tissue in antibiotic saline for culture
	PCR	Conrad	Frozen brain - cerebellum and cerebrum	Frozen at -80C, ship on dry ice	\$287.93 for the first sample; each additional sample or additional gene is \$141.40	Varies	Recommend frozen tissue for PCR
	IHC	CAHFS	Formalin fixed tissue sections from positive culture, PCR cases	N/A	\$60.50	2 weeks	Recommend formalin fixed tissue for IHC
<b>Vibrio spp.</b>	Molecular characterization	Animal Samples	Conrad	Microbial culture	N/A	Varies	Contact Lab
<b>Vibrio spp., E. coli spp., Enterococcus spp., total coliforms, fecal coliforms</b>	DFA, PCR	Environmental Samples	Conrad	Water (100ml): Clean and turbid water, estuarine water, ocean water, bivalves, sewage effluent and influent	Ship on cold pack	2 weeks	Contact Lab
<b>West Nile Virus (mammalian)</b>	Q RT-PCR	CAHFS	Brain	Frozen at -80C, ship on dry ice	\$48.75	2 weeks	

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
<b>Toxicology</b>							
Anatoxin-A	LC-MS/MS	CAHFS	50g GI contents (5g), 500 mL water (5ml)	Frozen	\$165.00	< 2 weeks	For microscopic algae ID, call Lab.
Anticoagulant Screen and confirmation	HPLC/DAD & fluorescence or LC-MS/MS	CAHFS	20 g Liver, 5ml serum, 5ml blood (RTT)	Frozen, blood on cold pack	\$165.00	< 2 weeks	Screen includes: brodifacoum, bromadiolone, chlorophacinone, coumachlor, difethialone, diphacinone, warfarin Confirmation analysis included.
Arsenic	ICP/AES	CAHFS	Non-metal container: 10g liver (2g), 10ml urine (2ml), 10g kidney (2g), 25g (5g) GI contents, 50ml water (10ml), 5ml (1ml) blood in EDTA tube	Frozen, blood on cold pack	\$46.25	1 week	See also heavy metals screen. Urine is of greater diagnostic value than blood if chronic exposure. If sending kidney, cortex is preferred.
Cadmium	ICP/AES or AA	CAHFS	Non-metal container: 10g liver (1g), 10g kidney (1g), 4ml (1ml) blood , 50ml (10ml) water	Frozen, blood on cold pack	\$46.25	1 week	If sending kidney, cortex is preferred.
Carbamate screen	HPLC/PC with fluorescence	CAHFS	100g (1g) GI content, 50g (1g) liver, 10ml (0.5ml) blood	Frozen, blood on cold pack	\$110.00	1 week	Cholinesterase should also be run on blood or brain
Cholinesterase	Modified Ellman method	CAHFS	Brain (right or left half), 1ml (0.5ml) blood in EDTA	Frozen, blood on cold pack	\$38.50	1-3 days	Half a brain (midsaggital) is necessary for data interpretation. STAT analysis is available

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
Chromium	ICP/AES or AA	CAHFS	Non-metal container: 10g (1g) liver, 10g (1g) kidney, 4ml (1ml) blood in EDTA tube	Frozen, blood on cold pack	\$46.25	1 week	See also heavy metals screen. If sending kidney, cortex is preferred.
Domoic acid	LC-MS/MS	CAHFS	5ml (2ml) urine, 5ml (2ml) serum	Frozen	\$165.65	1 week	
Heavy metal screen	ICP/AES or AA	CAHFS	Non-metal container: 10g (2g) liver, 10g (2g) kidney, 50g (10g) feces, 100ml (20ml) water	Frozen	\$60.50	1 week	Includes: As, Cd, Cu, Fe, Hg, Mn, Mo, Pb, Zn. For blood, see each specific element and trace element screen. If sending kidney, cortex is preferred.
Heavy metal extended	ICP/AES or AA	CAHFS	Non-metal container: 25g (2g) liver, 25g (2g) kidney, 50g (10g) GI contents, 100ml (20ml) water	Frozen	\$62.75	Contact lab	Call lab for availability – this is a special analytical request. Test available for: As, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Zn, Tl, V.
Lead - blood	AA	CAHFS	1ml (0.2ml) whole blood in EDTA or heparin tube	On cold pack	\$44.00	1-3 days	STAT analysis available. Serum or plasma not appropriate
Lead - tissue	ICP/AES or AA	CAHFS	Non-metal container: 10g (1g) liver, 10g (1g) kidney, 10ml (1ml) water, 25g (2g) bone	Frozen	\$49.50	1 week	See also heavy metals screen. If sending kidney, cortex is preferred.
Mercury	ICP/AES	CAHFS	5ml (1ml) blood in EDTA tube, Non-metal container: 10g (1g) liver, 100ml (20ml) water, 5ml (1ml) urine	Frozen, blood on cold pack	\$137.50	1 week	See also heavy metals screen. If sending kidney, cortex is preferred.

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
Microcystins	LC-MS/MS	CAHFS	50g (5g) GI contents, 500ml (5ml) water	Frozen	\$165.00	< 2 weeks	For microscopic algae ID, call Lab. Includes: microcystin LR, YR, RR and LA.
Organic compound	Variable	CAHFS	Contact lab		\$165.00	Varies	Special analytical service. Call lab for prices and samples needed. Additional costs may apply.
Organochlorine insecticide screen	GC/ECD	CAHFS	50g (1g) liver, 50g (1g) blubber, 50g (1g) brain, 100g (1g) GI content, 10ml (0.5ml) blood, 100ml (1ml) milk	Not in plastic container, ship frozen, blood on cold pack	\$110.00	1 week	
Organophosphorus insecticide screen	GC/FPD	CAHFS	100g (1g) GI content, 50g (1g) liver, 10ml (0.5ml) blood	Not in plastic container, ship frozen, blood on cold pack	\$110.00	1 week	Cholinesterase should also be run on blood or brain
PCB screen	GC/ECD followed by GC/MS	CAHFS	50g (1g) liver, 50g (1g) blubber, 50g (1g) brain, 100g (1g) GI content, 10ml (0.5ml) blood, 100ml (1ml) milk	Not in plastic container, ship frozen, blood on cold pack	\$110.00	< 2 weeks	Confirmation analysis included. Aroclors: 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262
Pyrethrin/Pyrethroid screen	GC/MS	CAHFS	100g (1g) GI content, 50g (1g) liver, 10ml (1ml) serum, 10ml (0.5ml) blood	Not in plastic container, ship frozen, blood on cold pack	\$126.50	1 week	Screen includes allethrin, bifenthrin, cyfluthrin, cypermethrin, fenvalerate, permethrin, pyrethrins. Call lab regarding others.
Saxitoxin	LC-MS/MS	CAHFS	50g GI contents, 20ml urine, 5ml serum, 100ml water	Frozen	\$137.50	< 2 weeks	

Test	Description	Testing Lab	Specimens	Shipping and Handling	Cost	Turnaround Time	Comments
Selenium - blood	ICP/AES	CAHFS	5ml (1ml) blood in EDTA tube	Blood on cold pack	\$19.75	1 week	Serum not appropriate
Selenium - tissue	ICP/AES	CAHFS	Non-metal container: 10g (1g) liver, 50g (5g) GI content, 100ml (20ml) water	Frozen	\$26.50	1 week	
Salt screen	ICP/AES	CAHFS	Non-metal container: 10g (1g) brain, 1ml (0.5ml) CSF, 100ml (20ml) water, eye (vitreous)	Frozen	\$35.25	1 week	Includes P, S, Mg, Na, Ca, K
Trace element screen	ICP/AES	CAHFS	2ml (0.5ml) serum, 2ml (0.5ml) plasma in royal blue top or heparin tube	Frozen	\$55.00	1 week	Includes Cu, Zn, Fe, Mg, Ca, Na, K and P. Serum or plasma must be separated. If testing Zn avoid any contact w/rubber at collection/shipping
Vitamin A	HPLC/PC with fluorescence	CAHFS	Sealed container wrapped in foil: 10g (1g) liver, 5ml (0.5ml) serum, 5ml (0.5ml) plasma	Frozen	\$38.50	1 week	Separate serum or plasma must be separated prior to shipping. Minimize contact w/light and keep cool at all times. Wrap in foil.
Vitamin E	HPLC/PC with fluorescence	CAHFS	Sealed container wrapped in foil: 10g (1g) liver, 5ml (0.5ml) serum, 5ml (0.5ml) plasma	Frozen	\$38.50	1 week	Separate serum or plasma must be separated prior to shipping. Minimize contact w/light, keep cool. Wrap in foil.

**Rates and fees are subject to change.**

The rates are for regular diagnostic cases only.

For a quote for bulk testing rates, research project costs or contract rates, please contact the lab.

## Test Definitions

CF	Complement fixation
DFA	Direct fluorescent antibody
ELISA	Enzyme-linked immunoassay
EM	Direct electron microscopy
ID	Immunodiffusion
IFA	Immunofluorescent assay
IMS	Immunomagnetic separation
IPX	Immunoperoxidase
MAT	Modified agglutination test
PCR	Polymerase chain reaction
Q PCR	Quantitative polymerase chain reaction
RT-PCR	Reverse transcriptase polymerase chain reaction
VI	Virus isolation
MPN	Most probable number
HPLC/PC	High-performance liquid chromatographic-post column derivatization
ICP/AES	Inductively coupled plasma-atomic emission spectrometry
LC-MS/MS	High-performance liquid chromatography with tandem mass spectrometry detection
HPLC/DAD	High-performance liquid chromatography with photodiode array
AA	Atomic absorption spectrometry
GC/ECD	Gas chromatography and electron capture detection
GC/FPD	Gas chromatography and flame photometric detection
GC/MS	Gas chromatography-mass spectrometry