

Microbiology

Antibiotic Panels

Due to continuous changes in antibiotic availability, please see web site for a current listing.

Microbiology Specimens

Fluids and tissues are the preferred specimen type. However, if swab is submitted, at least one swab per culture type is necessary.

Transport containers available through Marshfield Labs:

- A.C.T. I tube – for anaerobic culture, tissue
- ESwab – for swab collected aerobic and anaerobic cultures
- Liquid Dental Transport – for anaerobic culture, fluids
- 10% formalin – for Cryptosporidium & Giardia
- Gray top urine transport tube (Urine Transfer Straw Kit) – for ≥ 4 mL urine for culture
- M6 Transport Medium
- Mastitis culture vial – sterile container is preferred. Due not submit Whirl-pak due to disruption of the cream layer where the culture is performed.
- Sterile snap-top, leak-proof container - for urine, fungal, fecal float, or dematophyte cultures.
- SPS (YTT) Vacutainer tube - for blood culture

Milk Cultures

The milk specimen obtained for culture must be obtained aseptically. The teat should be clean and dry and the teat end should be prepped with an alcohol swab and allowed to dry. Milk should be stripped from the teat and then delivered into the specimen container. Samples collected just before milking may enhance detection of microorganisms. The milk specimen must be kept cold or frozen prior to and during shipment to the laboratory.

Milk from the bulk tank should be obtained with a clean instrument (a syringe can be used) and placed into a clean, dry container. Bulk tank milk should also be frozen. Three samples of bulk tank milk, taken on 3 consecutive days, are the recommended sample for bulk tank culture. Containers for submission of milk cultures may be obtained from Marshfield Labs.

The standard inoculum for milk culture is a 200 uL aliquot of the cream layer of the submitted sample. Milk cultures are screened for *Staphylococcus aureus*, (*S. aureus*); *Streptococcus agalactiae*, (*Strep ag.*), *Streptococcus uberis*, (*S. uberis*), *Listeria Monocytogenes*, and *Enterococcus* sp. Other potential pathogens include *Actinomyces pyogenes*; *Klebsiella sp.*, *Escherichia coli*, *Corynebacterium bovis*, and yeast.

Cultures will be screened for the above pathogens. If no obvious pathogen is observed, the culture will be reported as a “mixed culture” indicating the number of environmental/fecal contaminants. Environmental contaminants are organisms normally in the cows environment, on the skin surface and on the sampler’s hand. If a milk sample contains three or more of these environmental contaminants, significance of any isolate is questionable. Typical environmental contaminants include *Streptococcus* sp., coagulase negative *Staphylococcus*, Diphtheroid-like bacillus and mixed coliforms. Ideally, another specimen should be carefully obtained from this animal so that the results of the repeat analysis will be meaningful.

History is critical in the interpretation of the milk cultures. If the animal has a history of clinical mastitis with a particular pathogen, has recently received antibiotics, or if a specific antibiotic is the drug of choice in the treatment of the animal, please indicate on the request form.

Sensitivity tests are not routinely performed against isolates of *Streptococcus* sp. with the exception of Enterococci. Streptococci are uniformly sensitive to penicillin and penicillin-type drugs. Enterococci are frequently resistant to these types of antibiotics. All Streptococcus isolates are differentiated as *S. agalactiae*, *S. uberis*, *Enterococcus* or *Streptococcus* sp.

Mycoplasma can cause infectious mastitis and are not found on routine milk cultures. Isolation of mycoplasma from milk requires inoculation of special media which permits the growth of these cell wall-defective organisms. Milk for mycoplasma culture should be obtained aseptically from the cow or bulk tank as described above. Samples which are heavily contaminated with bacteria are not useful for mycoplasma culture, as the organisms will be inhibited by bacterial overgrowth. Milk mycoplasma cultures are held for 8 days. Isolates on mycoplasma media are reported as “Presumptive Mycoplasma species” and are submitted to a reference laboratory for species identification.

Microbiology Specimen Submission Guidelines

Specimen	Culture Type	Transport Tube or Culture Medium			Transport Temperature	Notes	
Urine	Aerobic	≥ 4 mL sterile container or urine transport tube (gray top with boric acid)			Room Temperature	Do not submit in red top clot activator tubes	
		< 4 mL sterile container			Refrigerate		
Blood	Aerobic	SPS transport tubes: Minimum volumes:			Room Temperature		
		Recommendations for optimal recovery in blood cultures					
		Animal Body Weight	Number of Blood Cultures to Order	How Much Blood to Collect			
		1 – 4 lbs	1	One 3.3 mL tube			
		4 – 30 lbs	1	Two 3.3 mL tubes			
		30 – 80 lbs	1	Two 8.3 mL tubes			
		80 – 200 lbs	3	Five 8.3 mL tubes			
		> 200 lbs	4	Eight 8.3 mL tubes			
	Anaerobic	Performed from same SPS tube as aerobic culture			Room Temperature		
	Mycobacterial	SPS transport tubes: Minimum volumes:			Room Temperature		
		Recommendations for optimal recovery in blood cultures					
		Animal Body Weight	Number of Blood Cultures to Order	How Much Blood to Collect			
		1 – 4 lbs	1	One 3.3 mL tube			
		4 – 30 lbs	1	Two 3.3 mL tubes			
		30 – 80 lbs	1	Two 8.3 mL tubes			
		80 – 200 lbs	3	Five 8.3 mL tubes			
		> 200 lbs	4	Eight 8.3 mL tubes			
	Fungal	SPS transport tubes: Minimum volumes:			Room Temperature		
		Recommendations for optimal recovery in blood cultures					
		Animal Body Weight	Number of Blood Cultures to Order	How Much Blood to Collect			
		1 – 4 lbs	1	One 3.3 mL tube			
		4 – 30 lbs	1	Two 3.3 mL tubes			
		30 – 80 lbs	1	Two 8.3 mL tubes			
80 – 200 lbs		3	Five 8.3 mL tubes				
> 200 lbs		4	Eight 8.3 mL tubes				

Specimen	Culture Type	Transport Tube or Culture Medium	Transport Temperature	Notes
Skin	Aerobic	Swab in Amies transport medium (ESwab)	Room Temperature	
		Skin biopsy: Sterile container with small amount of sterile, non-bacteriostatic saline	Refrigerate	
	Fungal	Skin scrapings or brushings, hair or nails: Sterile container with small amount of sterile, non-bacteriostatic saline	Room Temperature	
	Dermatophyte	Skin scrapings or brushings, hair or nails: Sterile container with small amount of sterile, non-bacteriostatic saline. Specimen inoculated into DTM media also acceptable.	Room Temperature	
Body Cavity Fluids	Aerobic	Sterile container	Room Temperature	Do not submit in red top clot activator tubes
	Anaerobic	Anaerobic transport tube (Liquid Dental Transport)	Room Temperature	
Feces	Fecal	Para-Pak C&S	Room Temperature	Do not submit in red top clot activator tubes
		Sterile container	Refrigerate	
Synovial Fluid	Aerobic	Sterile container	Room Temperature	Do not submit in red top clot activator tubes
	Anaerobic	Anaerobic transport tube (Liquid Dental Transport)	Room Temperature	
Many Anatomical Sites	Aerobic	Fluids: Sterile container	Room Temperature	Do not submit in red top clot activator tubes
		Non-fluids: Swab in Amies transport medium (ESwab)	Room Temperature	
		Tissue: Sterile container with small amount of sterile, non-bacteriostatic saline	Refrigerate	
	Anaerobic	Fluids: Anaerobic transport tube (Liquid Dental Transport)	Room Temperature	Anatomic sites normally colonized with anaerobic flora are not appropriate: Feces, upper respiratory tract, lower urogenital tract, etc.
		Small tissues: A.C.T. I tube		
		Large tissue: Sterile container with small amount of sterile, non-bacteriostatic saline		
		Non-fluids: Swab in Amies transport medium (ESwab)		
	Mycoplasma	Milk: Sterile container	Refrigerate specimens except milk can be frozen	Do not use wooden shafted swabs or submit in red top clot activator tubes
		Body fluids and tracheal washes: Sterile container		
		Swab in Amies transport medium (ESwab)		
	Acid fast	Fluids and fresh feces: Sterile container	Refrigerate	Do not submit swabs or submit in red top clot activator tubes
		Tissue: Sterile container in small amount of sterile, non-bacteriostatic saline		
	Fungal	Fluids, secretions, etc: Sterile container	Room Temperature	Do not submit in red top clot activator tubes
Tissues: Sterile container in small amount of sterile, non-bacteriostatic saline				
Dermatophyte culture: See skin				