**4.01 – Collection and Analysis of Lab Samples**

**Veterinary Laboratory Equipment**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- useful for basic testing procedures and can help identify and diagnose problems
	1. Veterinary assistants are responsible for the care and use of the microscope. They should cover the microscope when it is not in use and be trained on the use so they understand all working parts of it
	2. Each microscope will have several objectives to view under different magnifications
	3. A slide is placed on the stage of a microscope
	4. A slide is viewed through the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	5. The focus knobs are turned to properly view the sample
	6. All \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ should be cleaned after each use and follow the manufacturer’s instructions
	7. All slides and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ should be clean and have no cracks
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- used to spin lab samples at a high rate of speed and force.
	1. Most facilities have two types:
		1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- thin, small glass tubes that hold blood
		2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- used to spin larger volumes of liquid
	2. When a sample is placed in the rotor, the lid is closed and secured, then placed on the proper setting and time
	3. No one should stand directly over the centrifuge
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- tool used to measure the weight of a liquid and determine a liquid’s pH level
	1. A liquid sample is place on the prism
	2. Then held to a light source and viewed to determine specific gravity
	3. The refractometer has to be calibrated periodically with distilled water
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- machines that run blood samples including complete blood counts (CBCs) using whole blood, serum, or plasma
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- chemical kits to determine viruses and diseases with reagents that typically are kept in the refrigerator. Veterinary assistants need to be familiar with kits used by the facility.

**Fecal Sample**- used to diagnose internal parasites and the presence of blood in a stool sample.

1. First part is the gross examination (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) including: color, consistency, odor, presence and color of blood, presence of observable parasites, presence of mucous, and presence of foreign material or debris
2. Second is to perform a fecal smear by placing a small amount of sample onto a microscope slide. If the sample is dry it may require \_\_\_\_\_\_\_\_\_\_ drops of saline. The veterinarian or veterinary technician reads the sample under the microscope
3. Third is the fecal flotation to determine if there are any parasite eggs. The concept is that the eggs are lighter than the solution and the ova float to the top which is attached to the coverslip.
	1. Fecal floatation solution is usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solution
	2. Care must be taken to prevent the spread of parasites so gloves should be worn at all times

**Blood Chemistry Procedures**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tubes have a vacuum created to place a needle and syringe into a rubber plunger. Different tubes are used for specific requirements. Each tube has different colors to identify them
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Sterile or no anticoagulant that contains a gel separator
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Contains no silicone, gel separators, anticoagulants, or additives of any kind
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Sterile, contains EDTA as the anticoagulant
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Sterile, contains lithium heparin as the anticoagulant
	5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Sterile, contains sodium citrate as the anticoagulant
	6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Sterile, contains potassium oxalate and sodium fluoride as the anticoagulant
2. Each test requires a specific amount of blood, serum, or plasma to run the sample
3. Allow the samples that require centrifuging at least \_\_\_\_\_ minutes to clot prior to spinning but not more than \_\_\_\_\_ minutes
4. Specific procedures
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- evaluates the different types of white blood cells
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- evaluates the blood cell morphology
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- measurement of the percentage of red blood cells in whole or unclotted blood (also a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).
	4. Plasma Protein (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)- measures the ratio of protein within the blood and checks the hydration of the patient

**Urine Sample**- complete exam is called the urinalysis

1. Urine Collection
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- collected as the animal is urinating midstream
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- thin rubber or plastic tube inserted into the urinary opening
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- surgical puncture into the bladder using a needle to collect a urine sample.
2. Gross Examination
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- noting clarity, color, consistency, odor and presence of foam
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ properties- tested by using a reagent strip also called a chem strip or dip stick. A drop of urine is placed on each square pad of the strip and the values are recorded on the urinalysis sheet
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- places the urine in a centrifuge tube and spin down to evaluate the sediment that remains. The sediment is stained and placed on a clean slide with the patient name, client name, and date
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- A drop of the urine sample is placed on the refractometer

**Other tests**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- determines for the presence of bacteria and type of bacteria in a sample
	1. Gram positive stain purple and gram negative stain red
	2. Shape may be rods or cocci
	3. After the slide is prepared it is dipped into stains: crystal violet (purple), Lugol’s iodine (orange), saffranin (red), and the decolorizer as a rinse.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- determine bacterial or fungal growth in a culturette tube that is left untouched for 4-6 weeks to be observed.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- examining the body of a deceased animal to determine the cause of death