



Fecal, Blood, and Urine Examinations

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Objectives – Fecal Examinations

- Discuss the reasons why fecal samples are important to diagnosis
- Describe the techniques for collecting and preserving a fecal sample
- Describe the direct smear examination
- Describe the flotation examination
- Describe the gross examination

Fecal Examinations

- Reveal presence of parasites
 - Worm eggs
 - Worm larvae
 - Protozoal encysted and motile stages
 - Cysts and trophozoites
- Suspect G-I parasitic diseases
 - Diarrhea – with or without blood
 - Weight loss
 - Anemia
 - Decrease production
 - Stunted growth and development
 - Infertility
 - Abortions
 - Death

Fecal Collection

- Collect relatively fresh feces
 - Collect from rectum
 - Collect from environment
 - Free from debris of environment
- Preserve in refrigerator
 - Plastic or glass jar/vial
 - Plastic cup
 - Plastic bag

Fecal Direct Smear

- Advantages
 - Quick process
 - Preferred for motile parasites
 - Worm larvae and protozoal trophozoites
- Disadvantages
 - No concentration of eggs, larvae, and cysts

Fecal Direct Smear Procedure

1. Small amount of feces on glass slide
2. Mix with drop of saline
3. Place cover slip on mixture
4. Observe under microscope



Feces with drop of saline



Feces and saline mixture

Fecal Flotation

- Advantages
 - Concentration of eggs and cysts
- Disadvantages
 - More complex
 - Time consuming
- Fecal debris gravitates to bottom
 - Heavier than specific gravity of solution
- Eggs and cysts rise to top
 - Lighter than specific gravity of solution

Fecal Flotation Procedure

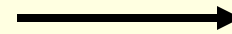
1. Collect feces with insert and place in vial
2. Add flotation solution (salt or sugar) (>1.2)
3. Close vial and mix thoroughly
 - Use of insert filters the fiber by inside strainer
 - Insert not used, strain solution through mesh



Step 1



Step 2



Step 3

4. Fill vial with more solution until positive meniscus forms
5. Place cover slip on meniscus
6. Wait 10-15 minutes
7. Place cover slip on slide
 - Observe under microscope

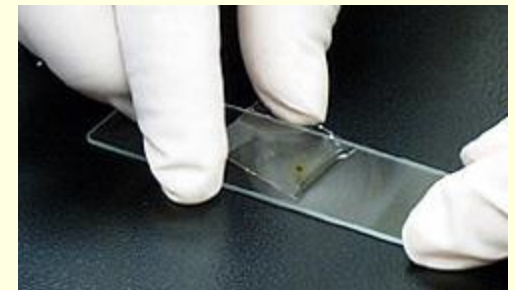


Step 4



Step 5

Wait
10-15 minutes



Step 7

Fecal Gross Examination

- Clinical findings
 - Abnormal color and consistency
 - Black
 - Red
 - Loose
 - Watery
 - Mucus
 - Blood
 - Undigested food

Objectives – Blood Examinations

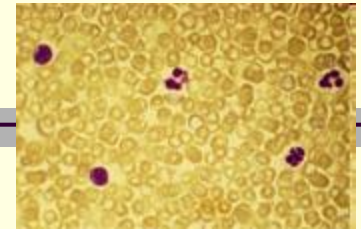
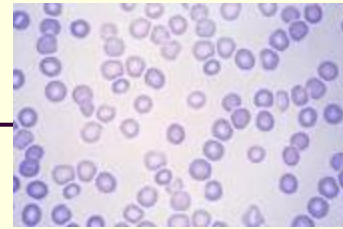
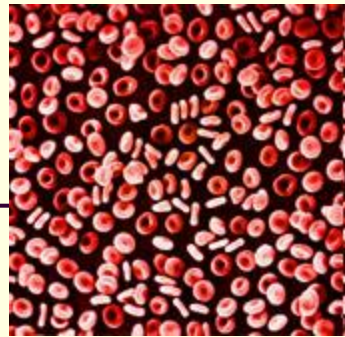
- Discuss the importance of blood samples in the diagnosis of certain diseases
- Describe the method for collecting blood from animals
- Describe the methods for preserving blood samples
- Describe blood smears
- Describe hemoglobin tests
- Describe blood cell counts
- List other types of blood tests

Elements of Blood

- Plasma fluid
 - Cells
 - Nutrients
 - Waste materials



■ Cells



- Erythrocytes – red blood cells (RBC)

- Leukocytes – white blood cells (WBC)

- Lymphocytes

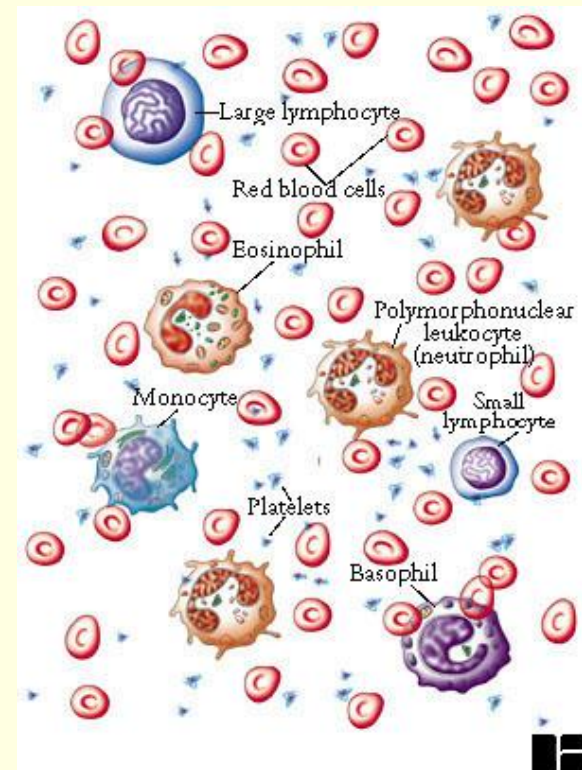
- Neutrophils

- Eosinophils

- Monocytes

- Basophils

- Thrombocytes – platelets



Blood Collection

- Drawn from vein
- Tourniquet, thumb pressure
- Needle and syringe
- Bleeding needle – draining tube
- Bleeding needle – vacuum tube

- Caution – RBC hemolysis
- Refrigeration



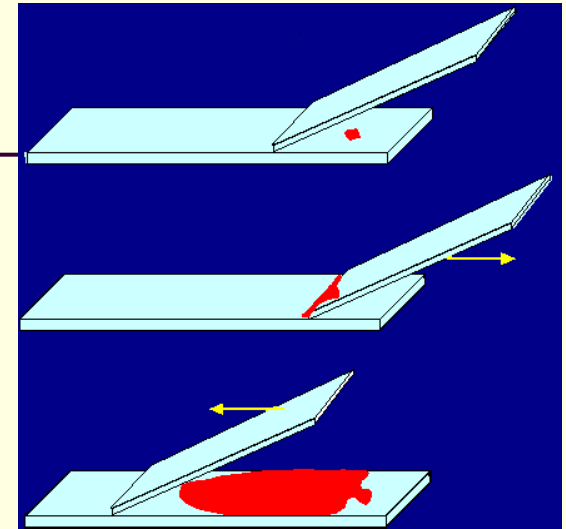
Whole Blood

- Coagulates and blood separates
 - Clot (cells, fibrin) and serum (fluid)
 - Heat enhances clotting
 - Centrifuge enhances separating
- Anticoagulant added and blood separates
 - RBC, WBC (buffy coat), plasma
 - Centrifuge enhances separating
- Anticoagulants
 - Heparin
 - Oxalate
 - Citrate
 - EDTA



Blood Tests

- Within 15 minutes
 - Microscopic wet blood smear on slide
 - Parasites
- Within 24 hours
 - Microscopic blood in cell slide (CBC)
 - Cell counts per ml
 - RBC
 - WBC
 - Platelets
 - Microscopic stained blood smear on slide
 - WBC differential percentages
 - Parasites



- Tube RBC hematocrit (Ht)
 - Packed cell volume (PCV)



- Tube RBC sedimentation rate
- Colorimeter hemoglobin (Hb)

Plasma – Serum Tests

(Blood Chemistry, Metabolic, Culture)

- Protein
- Glucose
- Minerals
- Electrolytes
- Enzymes
- Antibodies
- Antigens
- Hormones
- Toxins
- Infectious agents

Objectives – Urine Examinations

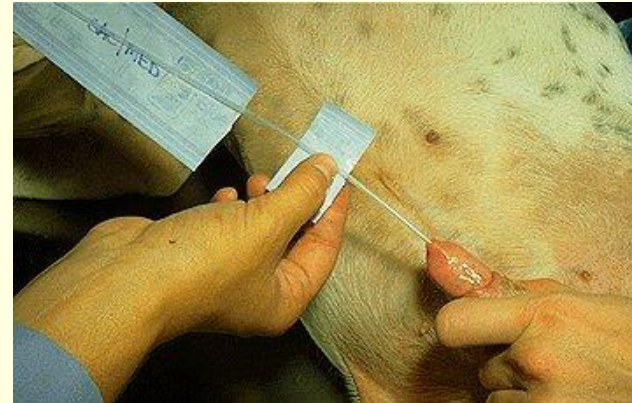
- Discuss the importance of urinalysis in confirming a diagnosis
- Describe the steps for collecting urine from livestock and small animals
- Describe the steps in physical examinations of urine
- Describe chemical examination of urine
- Describe the steps in microscopic examination of urine
- Perform physical, chemical and microscopic examinations of urine under the supervision of a veterinarians

Urine Examinations

- Collection
- Physical examination
- Chemical examination
- Microscopic examination

Methods of Collection

- Spontaneous micturition
- Manual compression of bladder
- Catheterization
- Cystocentesis



Catheterization on male dog



Cystocentesis on male dog

Physical Examination

- Quantity
- Specific gravity
 - Refractometer
 - Urinometer
- Color
 - Yellow to dark amber
 - Red (wine), brown (tea), or black (coffee)
- Odor
 - Mild to strong
 - Sour or sweet
- Consistency
 - Clear to cloudy
 - Flocculant or opaque

Chemical Examination

- pH
 - Dogs and cats (<7)
 - Horses and ruminants (>7)
- Albumin
- Glucose
- Bile
- Acetone
- Calcium
- Bilirubin
- Urobilinogen



Microscopic Examination

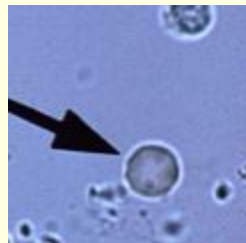
- Stained slide (direct microscope)
or non-stained slide (phase microscope)
 - RBCs
 - WBCs
 - Microorganisms
 - Yeast, fungi, and bacteria
 - Epithelial cells



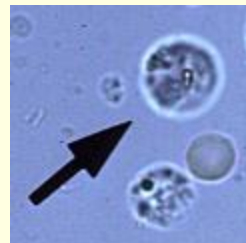
Yeast



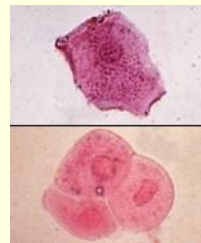
Fungi



RBC



WBC

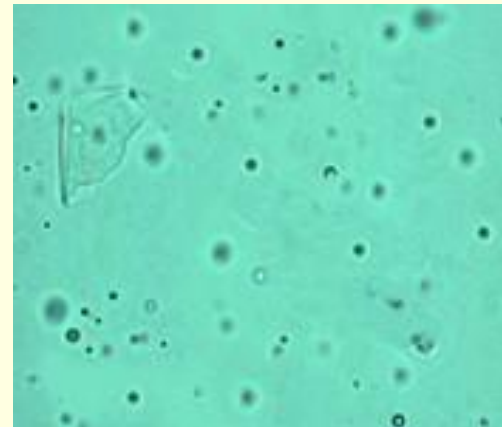


Epithelial Cells



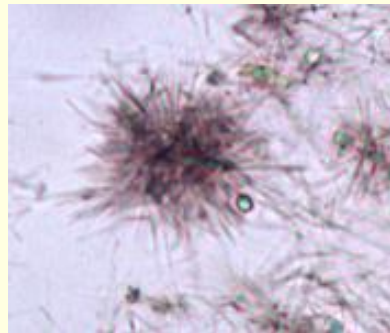
Bacteria

- Fat globules
- Precipitated crystals
 - Acidic
 - Alkaline

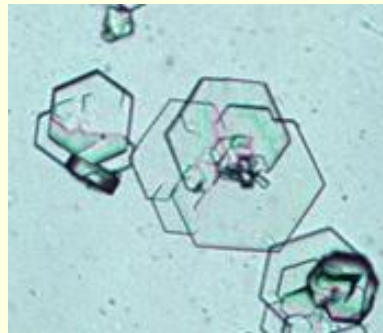


Fat Globules in Urine

Acidic Crystals



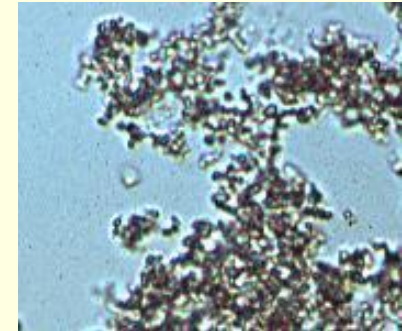
Trypsine



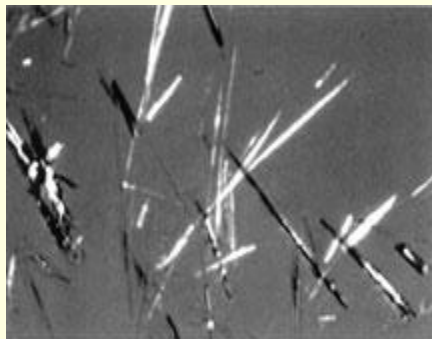
Cystine



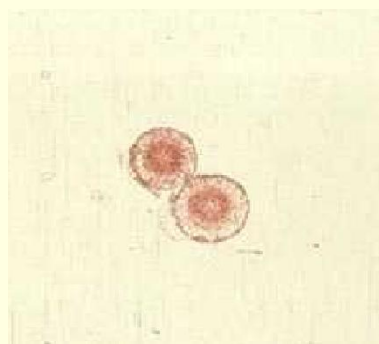
**Calcium Oxalate
Dihydrate**



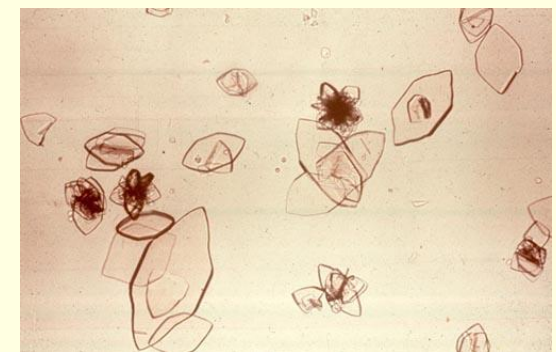
**Amorphous
Urates (Na, K,
Mg, or Ca salts)**



Sodium Urate

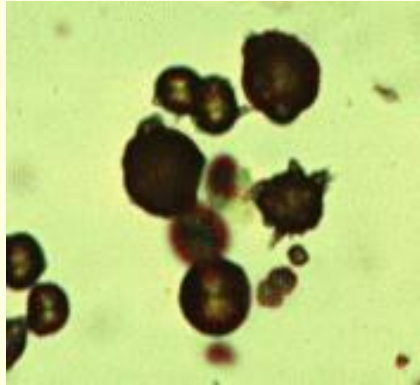


Leucine



Uric Acid

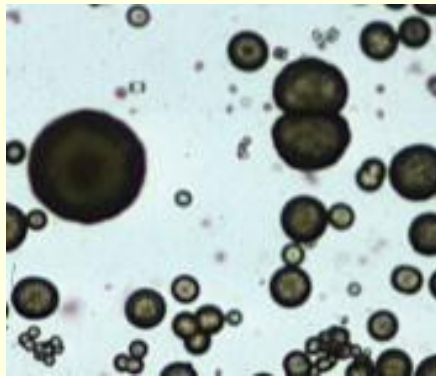
Alkaline Crystals



**Ammonium
Biurate**



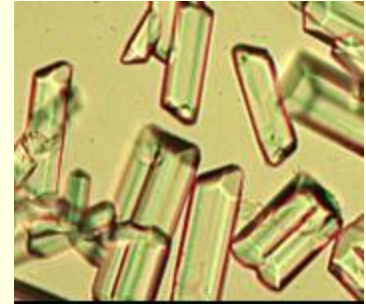
**Amorphous
Phosphate**



**Calcium
Carbonate**



**Dicalcium
Phosphate**



**Triple
phosphates
(Struvite)**

Conclusion

- Analysis of blood, feces, and urine reveals:
 - Health status
 - Diagnosis
 - Health improvement means
 - Preventive measures