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The Scoop on Poop

Basic Fecal Analysis

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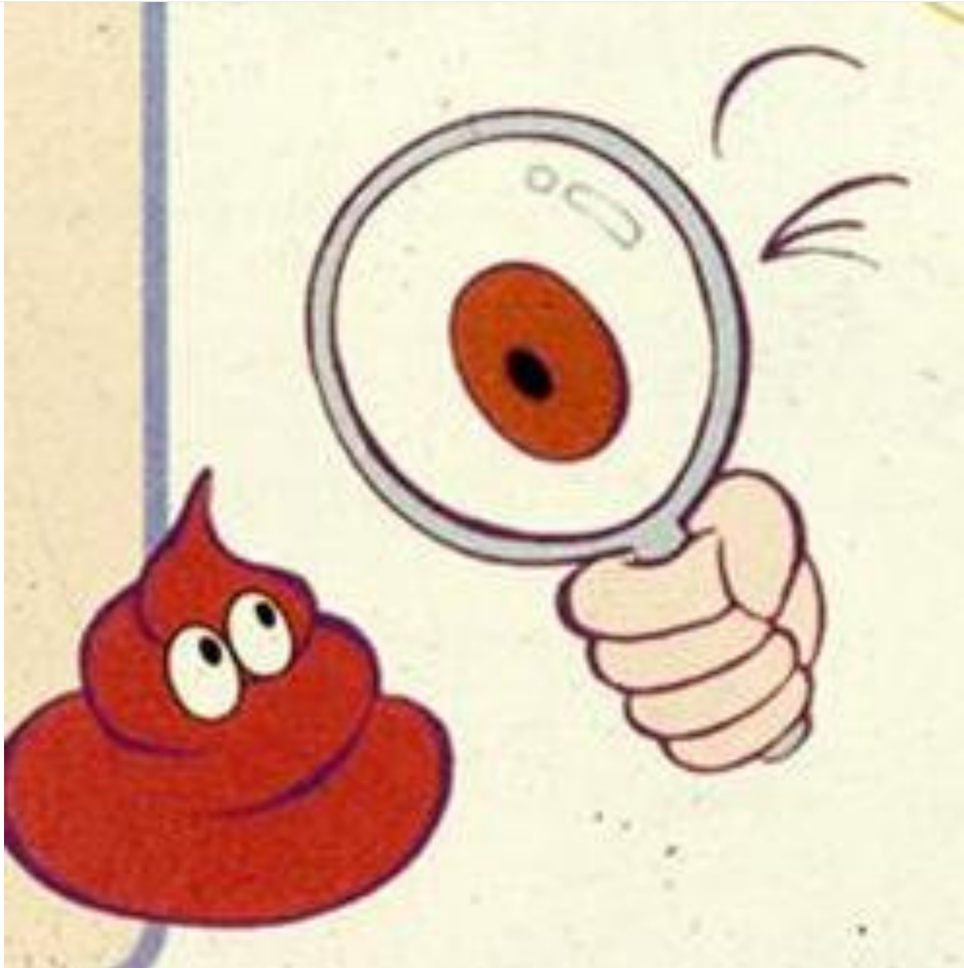
AUDUBON CENTER FOR BIRDS OF PREY

Why do a fecal analysis?

- Identify internal parasites
- Treat only parasites that patient has without giving unneeded medication
- Help animal feel as good as it can be before being released.
- Detect underlying disease



When should a fecal be done?

- When patient is admitted and stable
- Animal is thin, eating but not gaining weight, or anorexic
- Animals feces is abnormal color, consistence, or bloody

Materials needed for examination

- Microscope
- Fecal float solution
- Distilled water
- Fecal tubes
- Microscope slides & cover slips
- Stir stick
- Gloves
- Other less common materials
- Fecal sample

Your Friendly Neighborhood Microscope

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Your Friendly Neighborhood Microscope

- **Taking good care of your microscope is key**
- **Fecal exam routinely done with 10x objective**
- **Can go up to 40x for more detail of ova and protozoa**
- Care should be taken to not get fecal solution in 40x if it is used

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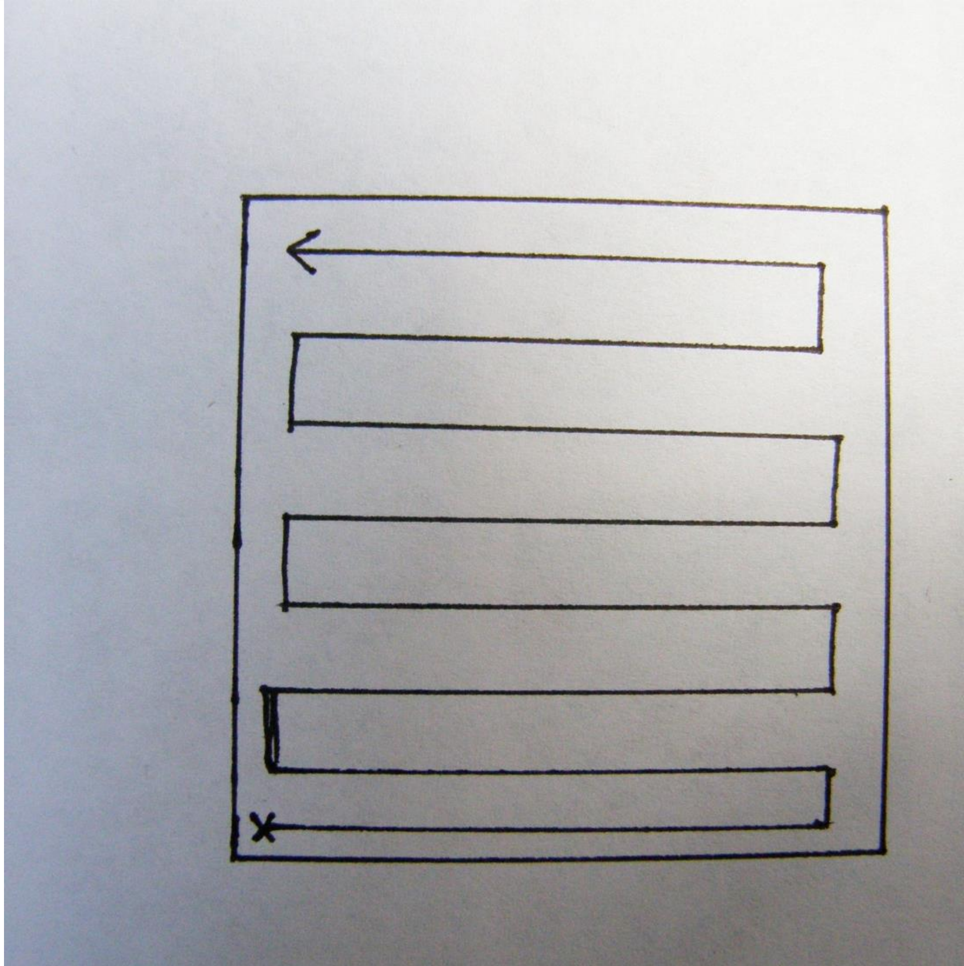
Your friendly neighborhood microscope

- **Adjust eye pieces so that you can see the slide with both eyes**
- Using only one eye is not only less accurate but hard on the eyes
- **Use condenser and iris to adjust amount of light coming though slide.**
- Iris closed and condenser down allow more shadows and make reading fecal slides easier

Your friendly neighborhood microscope

- When reading slides start in one corner of slide and move in systematic pattern to opposite corner



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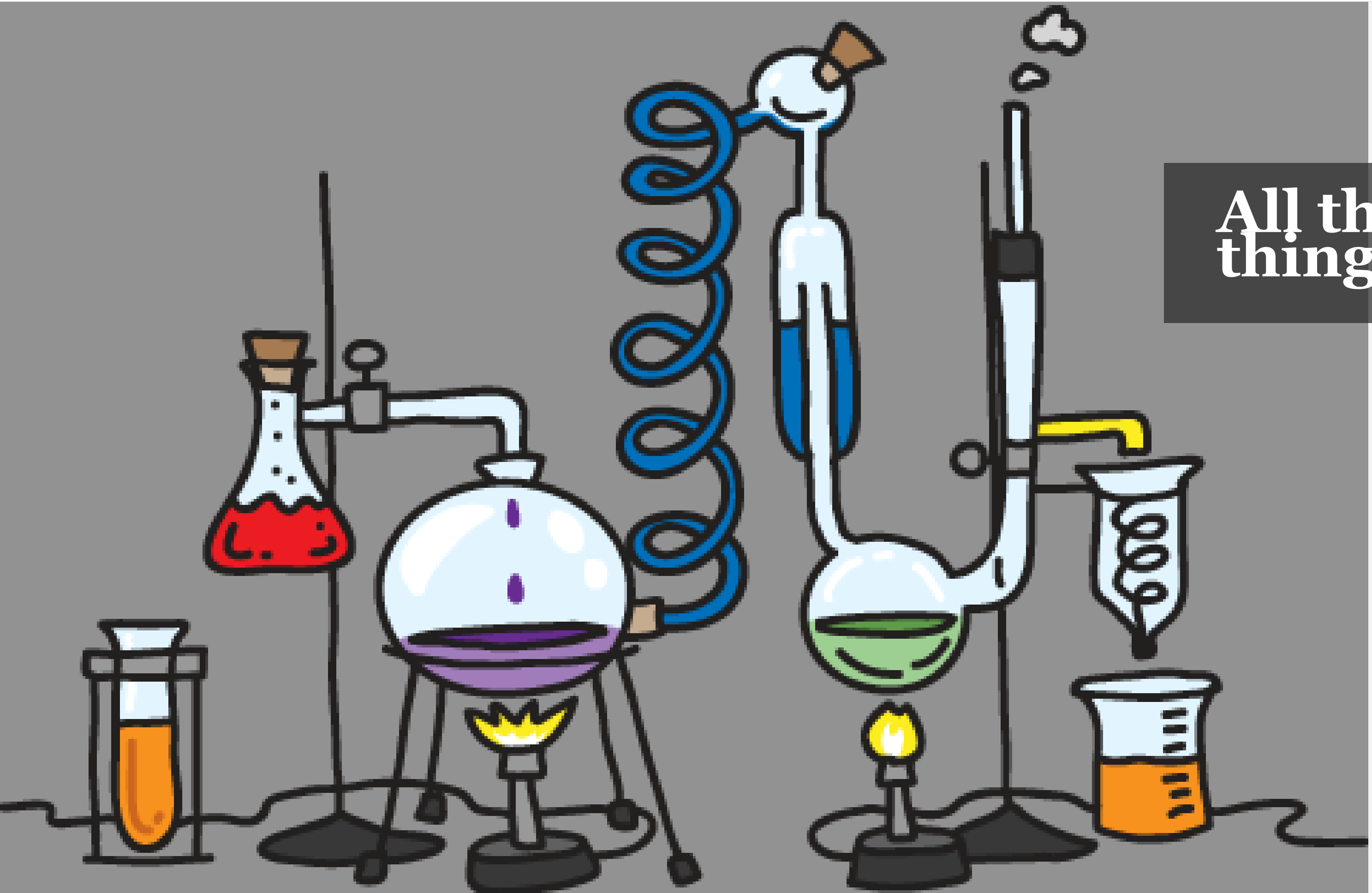
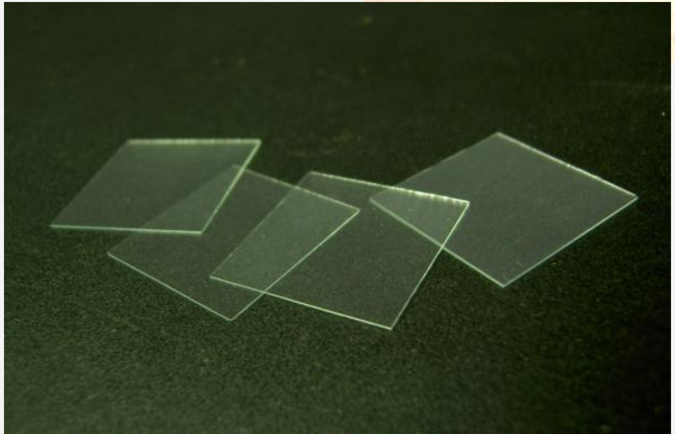


All the little things


STKI


Fecal Ova Float



Keeping it clean

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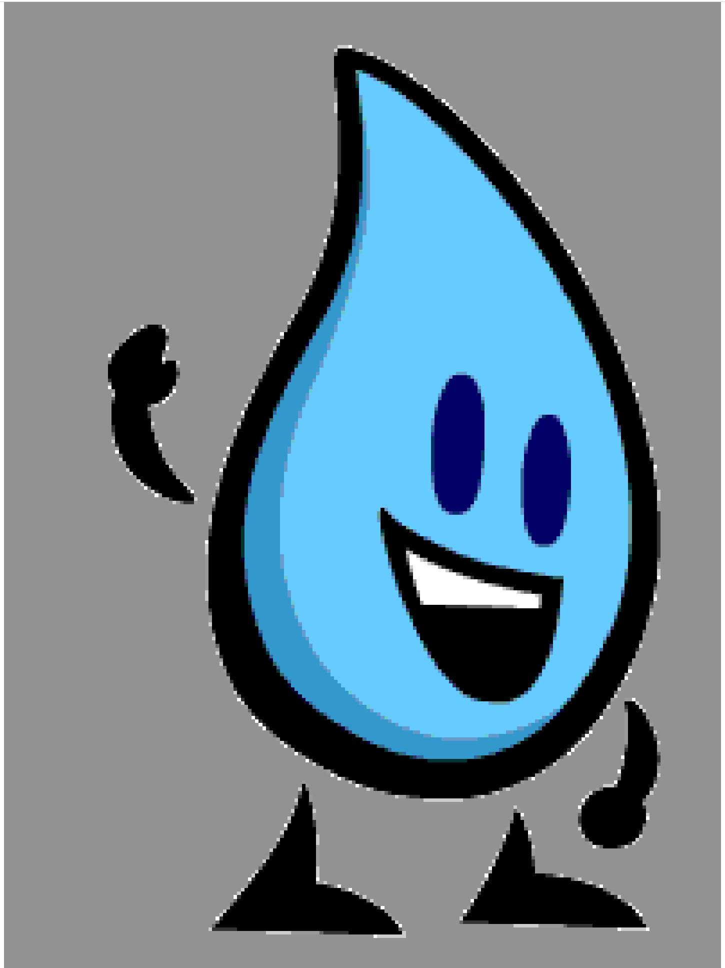
Nice and clean

- As a precaution always were gloves during fecal exam
- Wash hands and work area when done
- Personal protection is especially important when working with animals and parasites with zoonotic potential

Let the fecal solution flow



Distilled Water

- Use for looking at ova in direct fecal method
- Can also be used to look at wet mount for trichomonas

Fecal solutions

- Solutions used to float fecal sample must have higher specific gravity than the common parasites to allow eggs to rise to the top of the solution and be captured on to slide for exam
- Most standard float solutions are 1.2-1.25 g/ml

Zinc Sulphate:

- Advantage- floats protozoal organisms, little distortion, doesn't form crystals
- Disadvantage- expense

Sodium Nitrate:

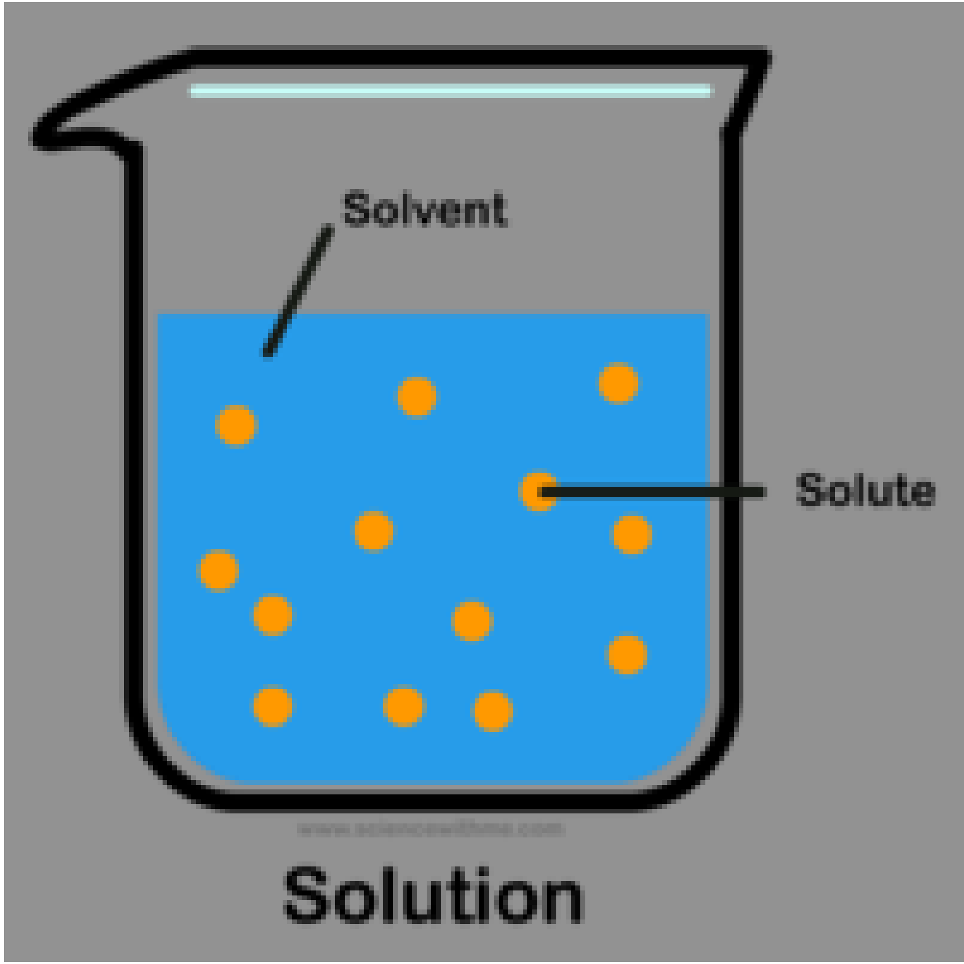
- Advantage- very common
- Disadvantage- forms crystals and distorts eggs if left to sit

Sugar solution:

- Advantage- inexpensive, doesn't crystalize or distort eggs. Long shelf life
- Disadvantage- sticky/ messy, attracts insects

Recipe for Modified Sheather's Flotation Solution

- Mix 454 g (1 lb) table sugar and 355 ml (12 oz) water. Dissolve slowly over gentle heat, or use indirect heat such as the top of a double boiler. Cool, add 6 ml full-strength (37-40%) formaldehyde as a preservative, and store at room temp. Can double-check specific gravity (~ 1.27) with a hydrometer.



Everyone poops-
notes about sample collection

Fecal sample collection

- **Collect freshest sample possible**
- If not able to exam within a few hours, refrigerate.
- Oocysts life cycle may be altered if allowed to sit making identification difficult
- **Know your patient**
- What does normal look like
- For Birds- know what part is feces

Fecal sample collection

- **Collect at least 1 teaspoon**
- Difficult in small patients
- **Collect multiple samples**
- Not all samples will have parasites
- Good overall evaluation
- Especially if multiple patients in one enclosure

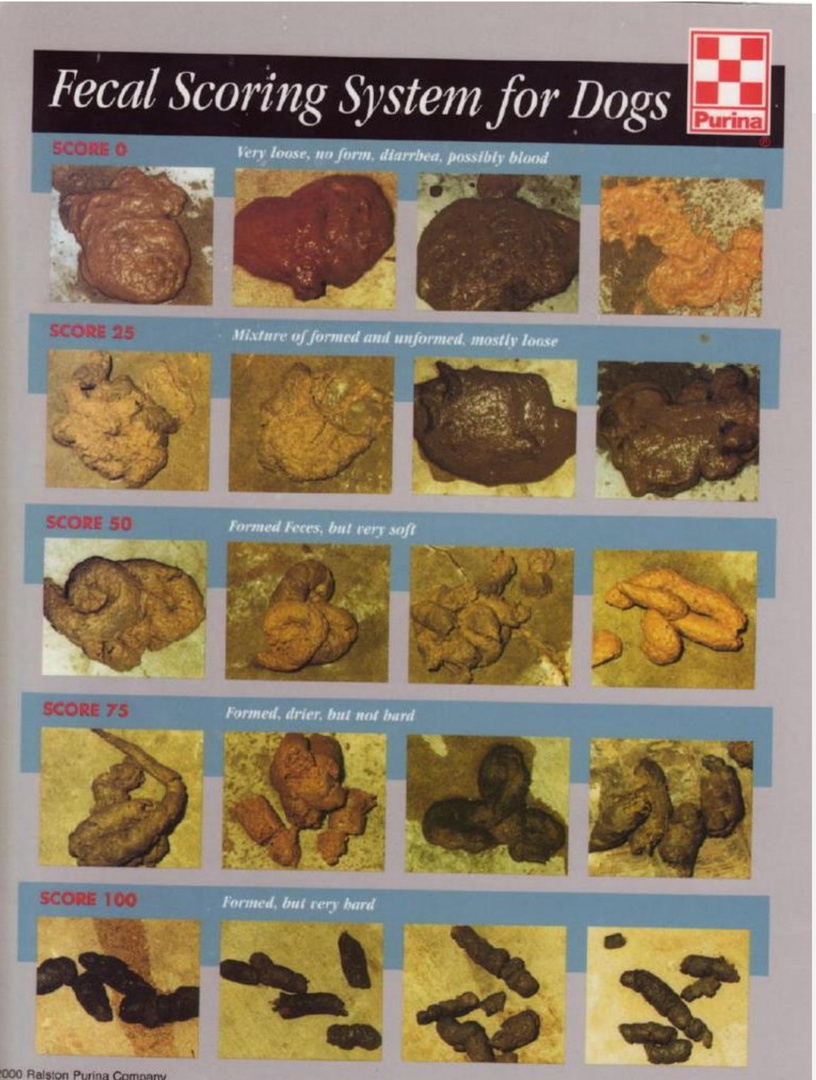
Fecal exam methods

- Gross Exam
- Direct Smears
- Fecal Flotation
- Centrifugal Flotation
- Staining

Gross examination

- **Consistency**
- Normal, diarrhea, constipation
- **Color**
- Affected by food
- Malabsorption
- Lead poisoning
- **Parasites**
- Tapeworm segments or roundworms

- **Blood**
- Fresh blood red in spots or streaks in fecal (bleeding from lower GI tract)
- Digested blood is dark and has tarry appearance (bleeding from upper GI tract)
- Blood can indicate severe parasitic infection or other serious intestinal diseases
- **Mucus**
- Digestive disorders
- Intestinal inflammation
- Infection



Fecal Scoring System for Dogs
Purina
SCORE 0
Very loose, no form, diarrhea, possibly blood
SCORE 25
Mixture of formed and unformed, mostly loose
SCORE 50
Formed Feces, but very soft
SCORE 75
Formed, drier, but not hard
SCORE 100
Formed, but very hard
©2000 Ralston Purina Company

Nestlé PURINA
FECAL SCORE CHART
Fecal consistency is primarily a function of the amount of moisture in the stool and can be used to identify changes in colonic health and other problems. Ideally, in a healthy animal, stools should be firm but not hard, pliable and segmented, and easy to pick up (Score 2).

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Direct smear fecal examination

- **Used to rapidly estimate an animals parasite burden**
- **Short prep time and minimal equipment needed**
- **May not detect low parasite levels**
- **Useful for heavy or other organisms that may not bee seen on float**
- Trematodes (flukes) often to heavy to float
- Giardia is lysed by float solution
- Can see motile protozoan

Direct smear fecal examination

- **Place 1-2 drops of distilled water on slide**
- **Mix small amount of fecal matter with water until clumps dissolve**
- **Place cover slip on drop of water**
- Mixed fecal matter should spread to the edge of cover slip

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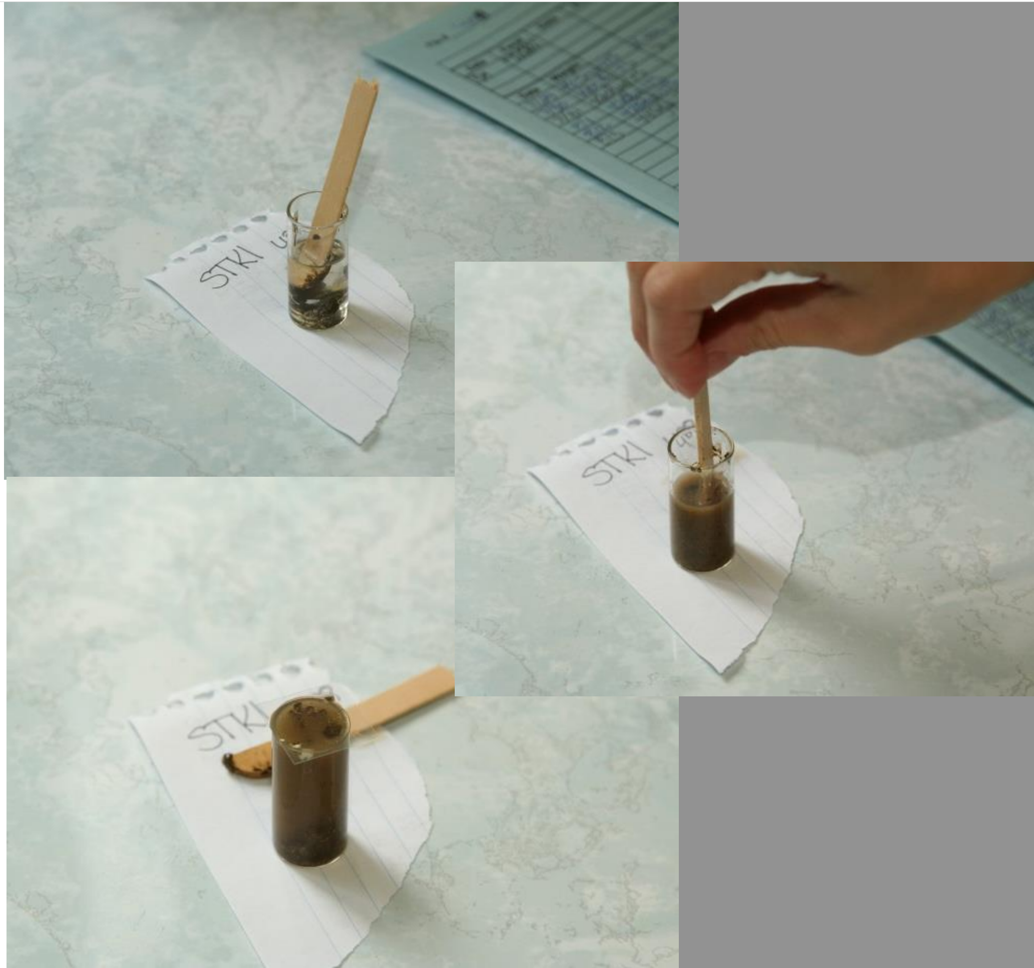
Fecal flotation

- Place feces in vile/ tube
- Fill tube 1/2 full with flotation solution and mix
- Fill tube with solution so that a meniscus forms
- Gently place cover slip on top of tube
- Allow to sit for 10-20 min
- Remove cover slip and place on microscope slide



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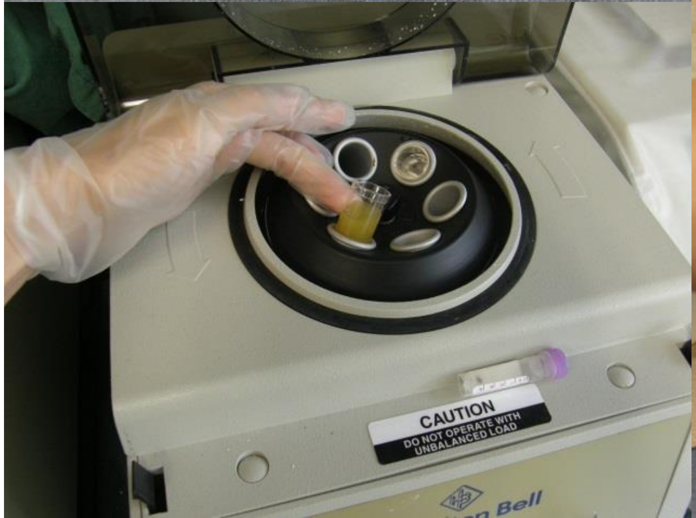
Fecal centrifuge

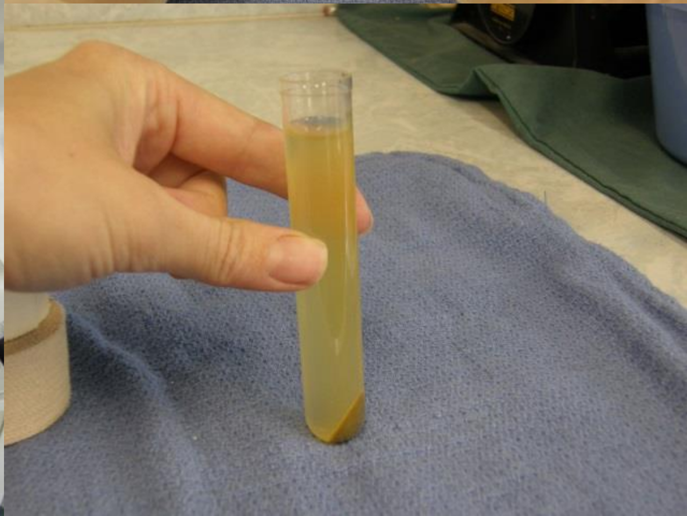
- More accurate but requires centrifuge
- Takes less time than flotation method if using horizontal (non fixed) centrifuge

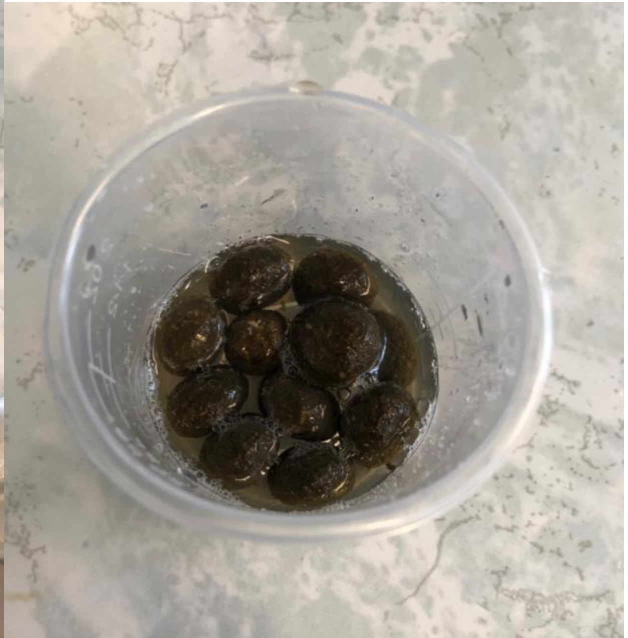
Fecal centrifuge

- In 15ml centrifuge tube mix fecal matter and flotation solution
- Fill to top of tube with flotation solution and place cover slip if using horizontal centrifuge (If using fixed-rotor centrifuge fill ½- ¾ full)
- Balance the centrifuge with filled 15ml tube
- Centrifuge for 5 minutes
- Remove cover slip (with 1/2 full tube remove top part of fluid with pipet and place on microscope slide with cover slip, also look at just the sediment for heavy ova)

Fecal Centrifuge



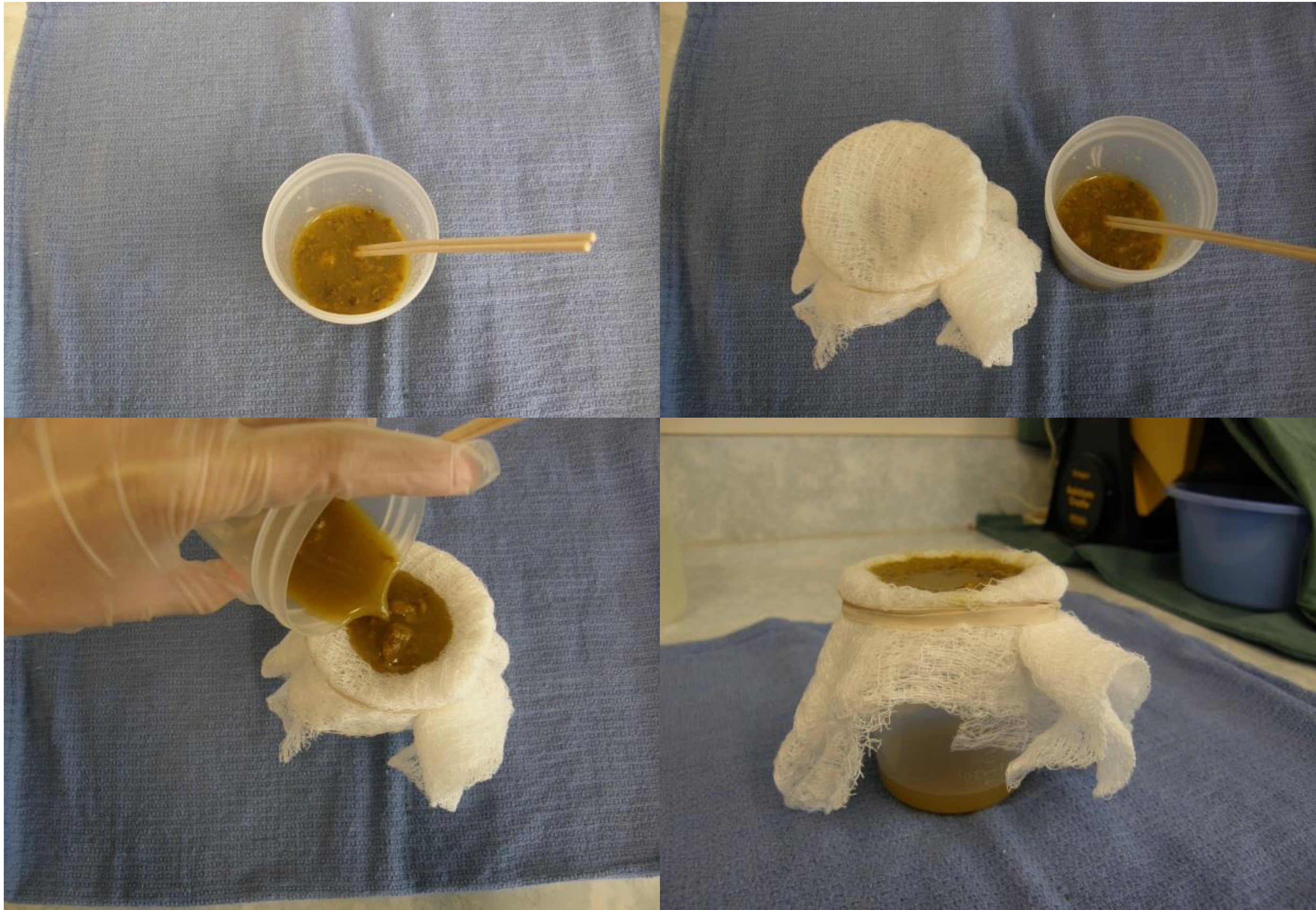


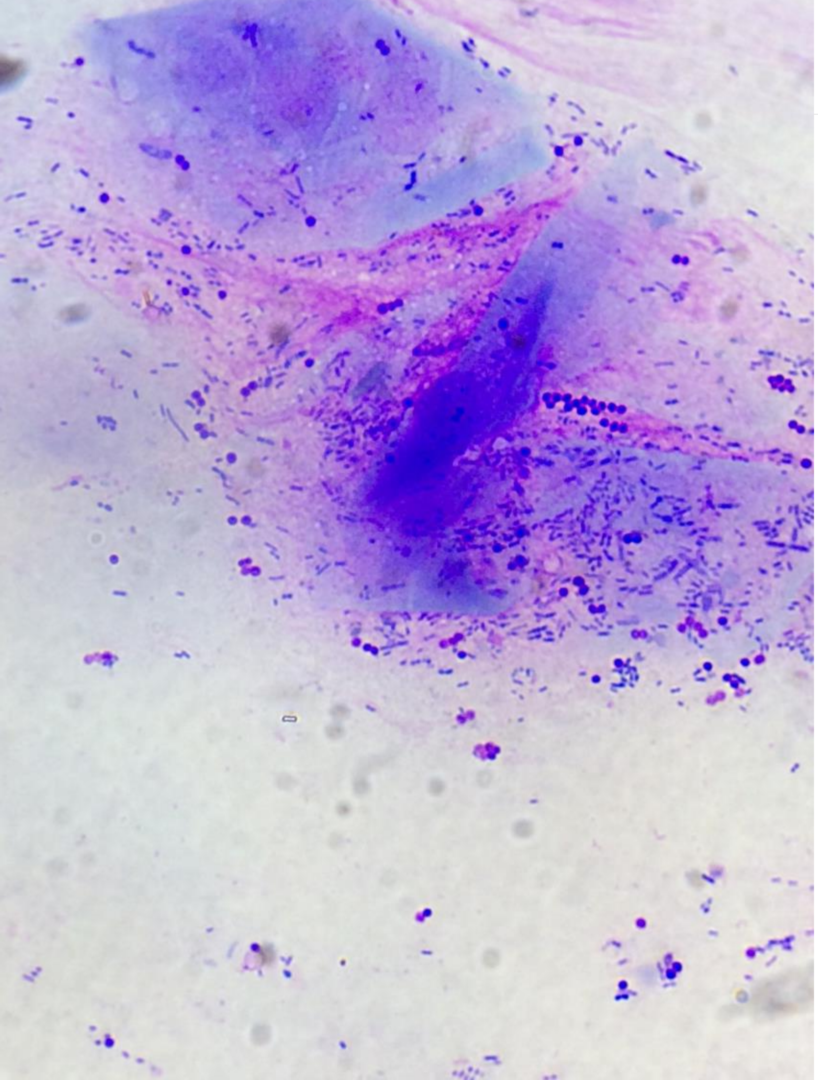


Species with dry fecal matter

- With large or dry samples fecal matter can be mixed with flotation solution then strained through cheesecloth before adding to vile/tube for either flotation or centrifuge methods

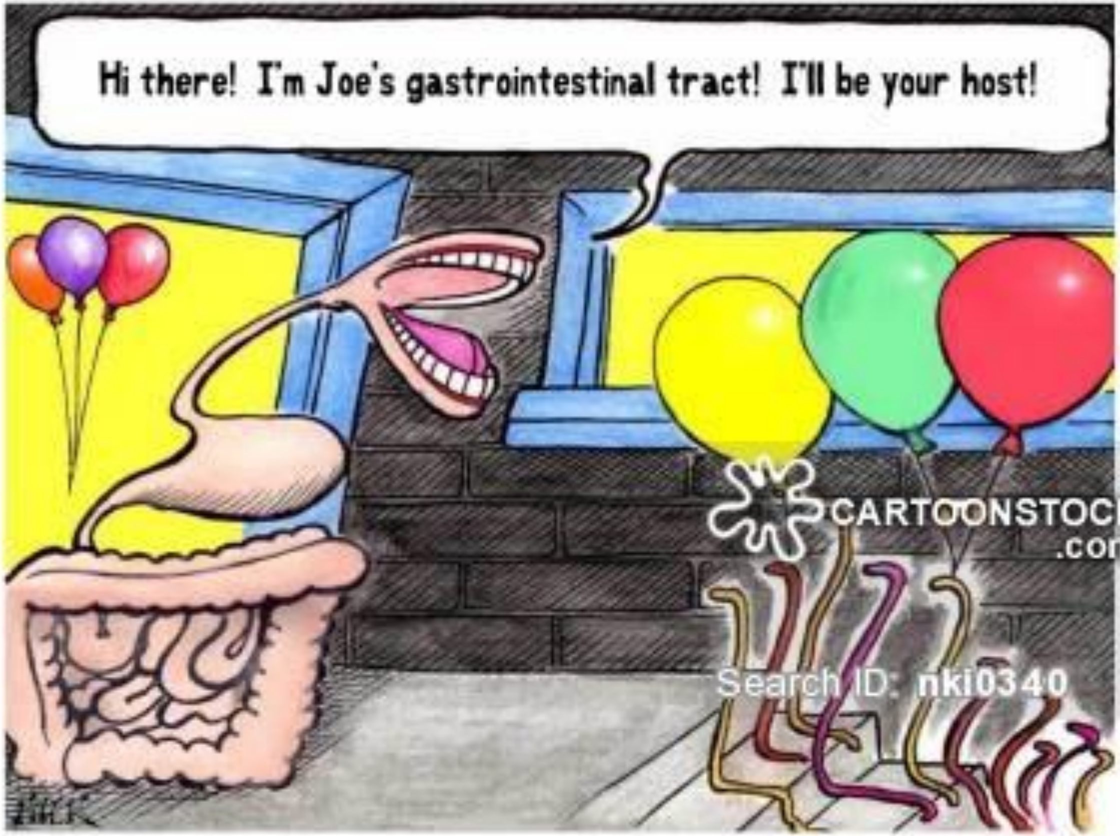
Dry fecal matter





Cytology and staining

- Good way to look at overall bacterial count
- Fungal
- Some parasites like giardia are easier to see when stained



Great tapeworm parties

Getting to know the contenders

Common internal parasites

Trematodes (flukes)

- Unsegmented flatworms with leaf shaped bodies
- Have cap on one end (operculum)

Protozoa

- One celled organisms
- Coccidia (Isospora or Eimeria)
- Trichomonas
- Giardia
- Cryptosporidium
- Toxoplasma

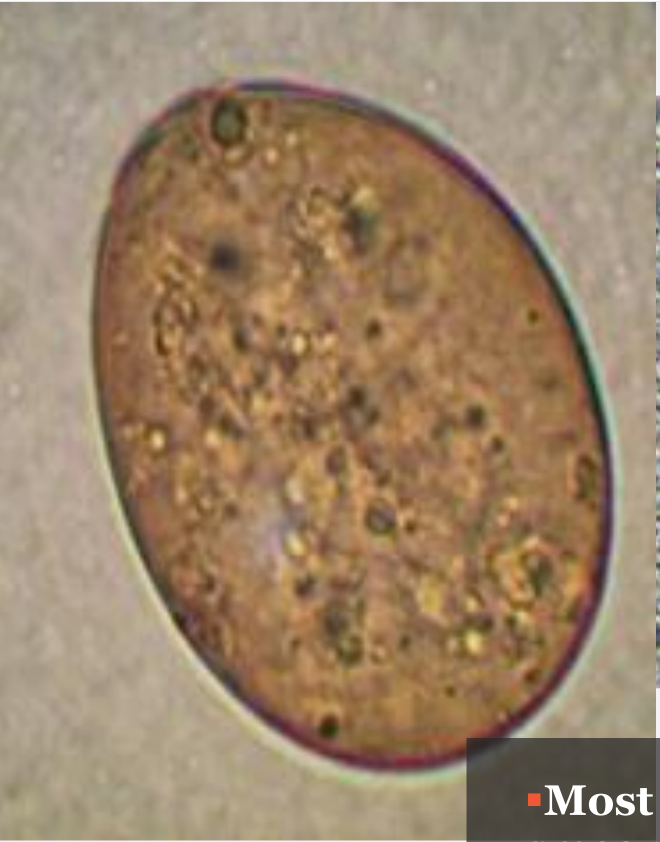
Nematodes

- Roundworms (Ascaridia, Toxocara, Baylisascaris)
- Hookworms
- Whipworms
- Threadworms (Capillaria)
- Gapeworms
- Thorney headed worms

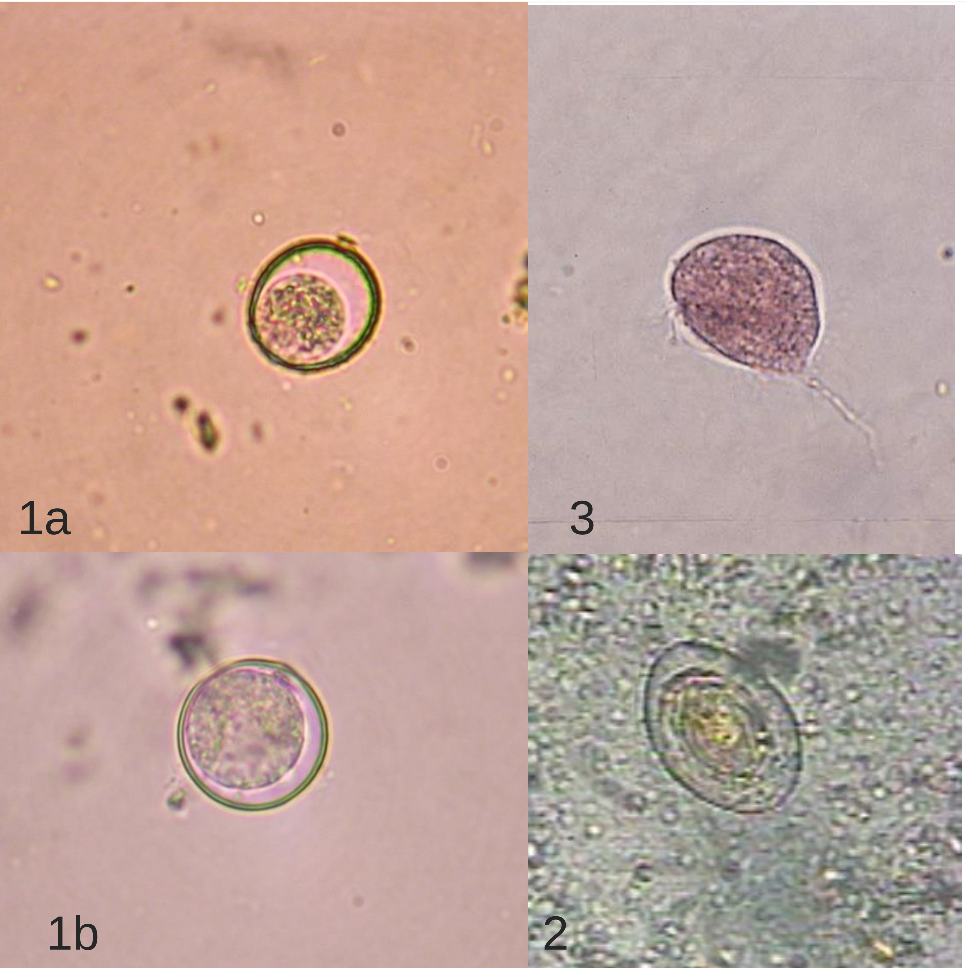
Cestodes (tapeworms)

- Ribbon-like flatworms divided into a long chain of segments (proglottids)

Trematodes (flukes)

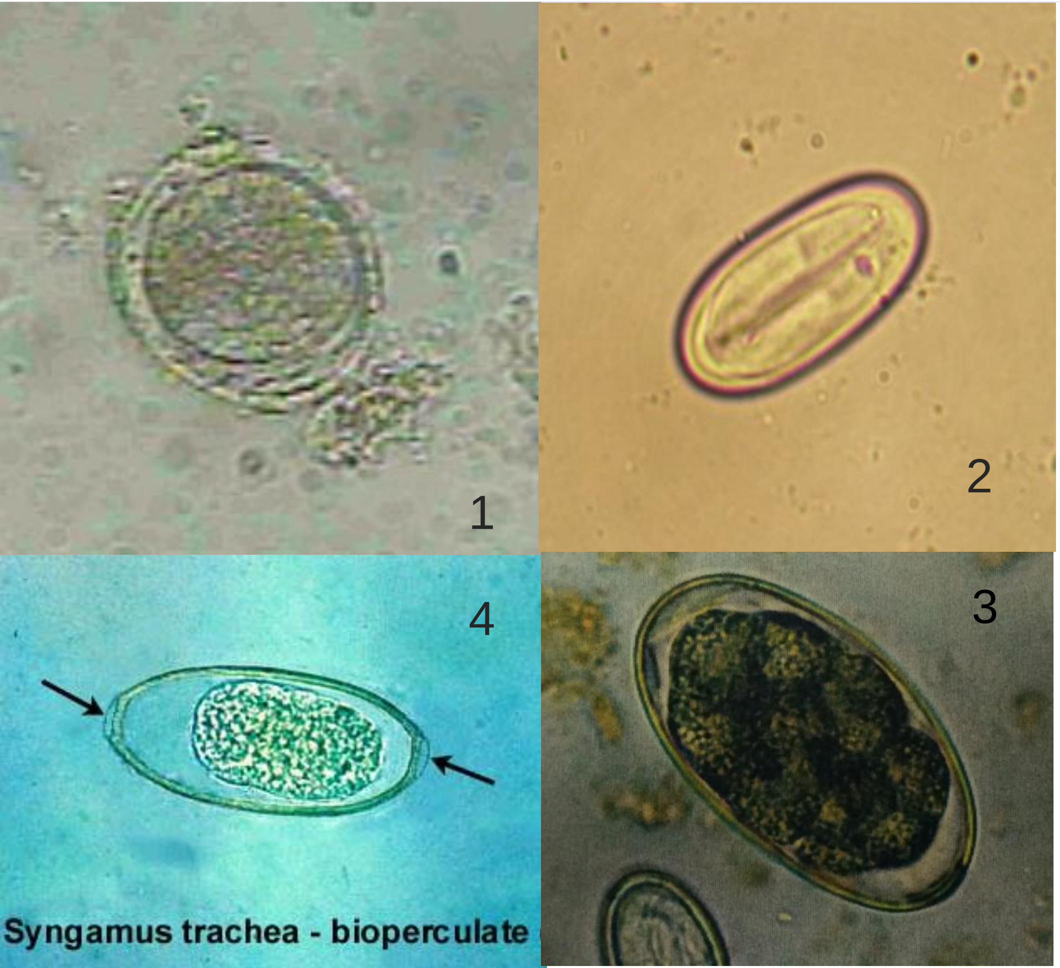


- Most commonly seen on direct smear
- If seen on flotation often distorted



Protozoa

- One celled organism
- Smaller than other parasites and can be easily overlooked
- Slightly fluoresce when focusing
- 1. Coccidia- most common
- 2. Eimeria- similar looking but more oval
- 3. Trichomonas- motile and seen on wet mount, has flagella



Nematodes

- 1. Roundworm: round cell with rough pitted shell and dense grainy interior
- 2. S. nematode: oval cell with smooth shell and larva like loop interior
- 3. Hookworm: oval cell with smooth shell and litter grainy interior
- 4. Gapeworm: looks like hookworm but has 2 operculum

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Nematodes- continued

- 1. Whipworms: football shaped with 2 polar plugs.
- 2. Capillaria: similar to whipworms but smaller and polar plugs may not be directly opposite one another

- Cappillaria and Whipworms maybe seen in some species and not others.

Cestodes (tapeworms)

- Ribbon-like flatworms divided into long chain of segments (proglottids)
- Proglottids can be seen with naked eye and have muscles that allow them to move
- Eggs identified by “hooks”

Helpful guides in identification

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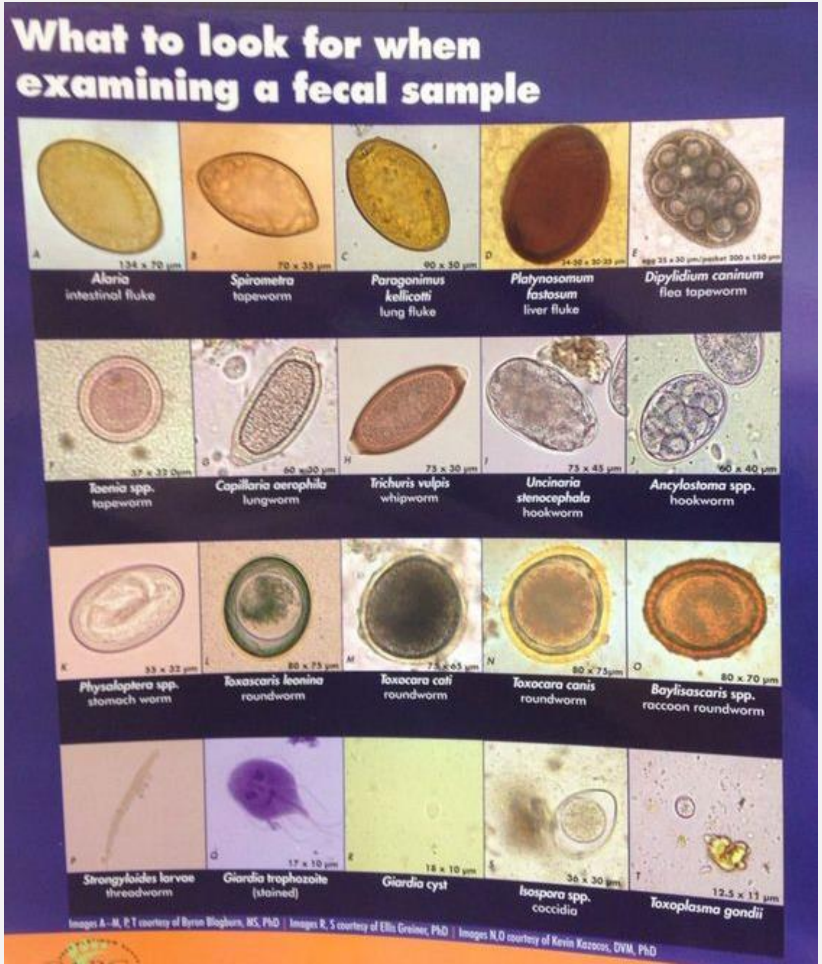
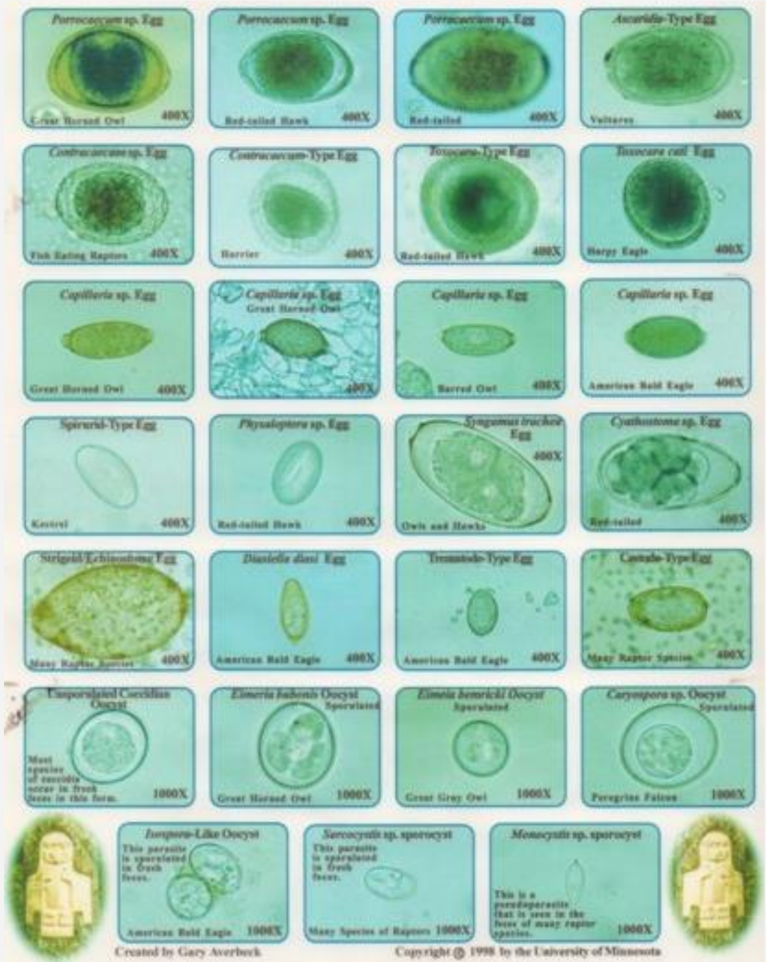
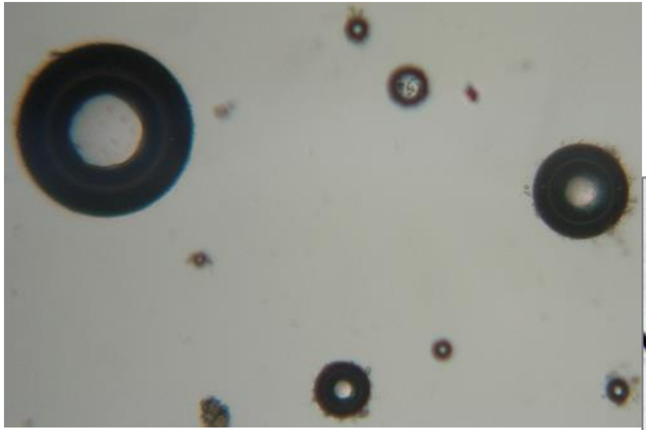
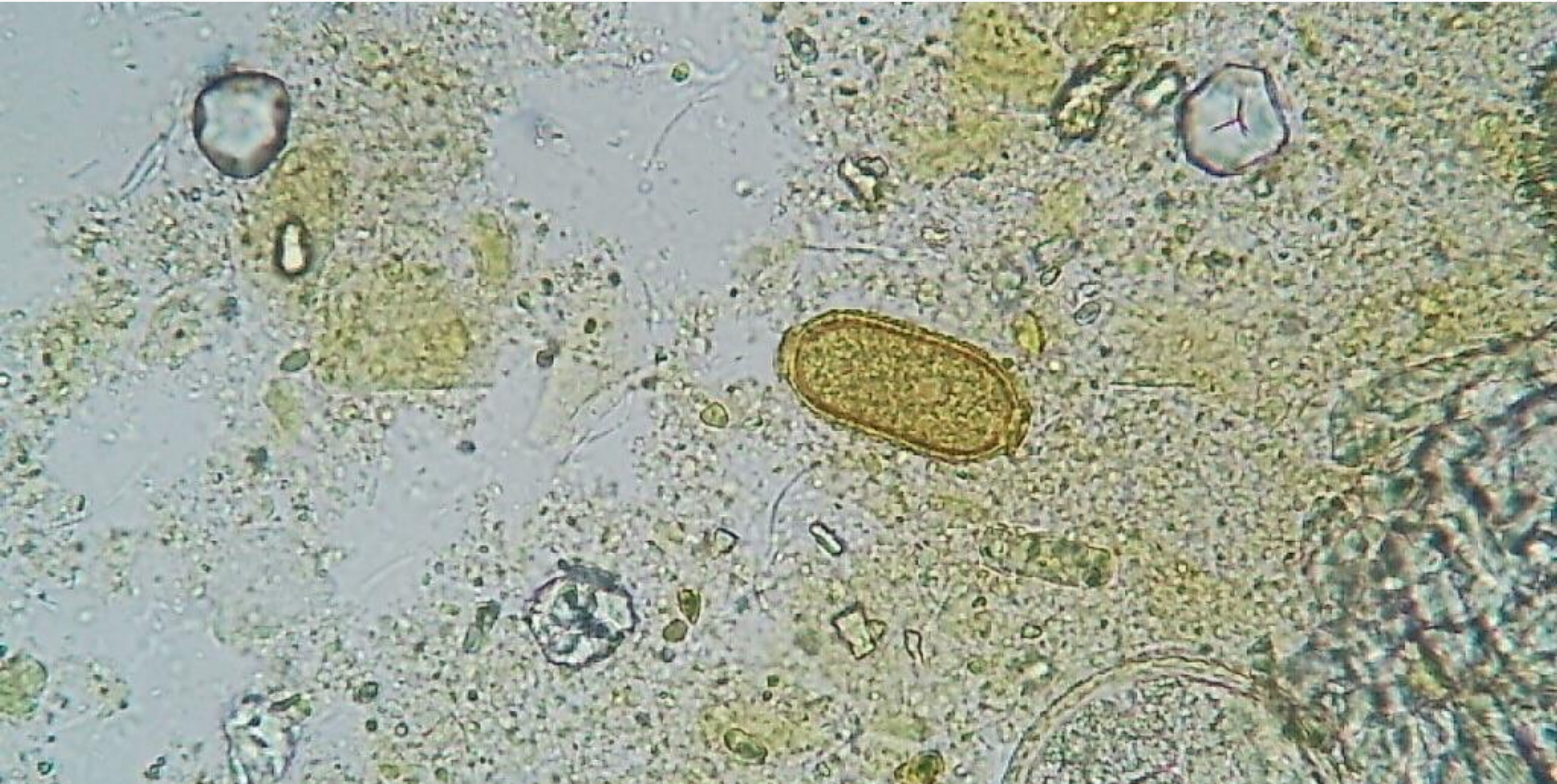




Other things you might see

- Air bubbles: black circular objects of varying size
- Mite eggs: large oval eggs (bigger than fluke) with grainy interior and may have one operculum
- Pollen: most common is “Mickey mouse” pollen. Has light brown circular “head” and darker brown “ears”






Its not that scary.
All you need to do is take the first step