Fecal examination

BY

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- **Feces:** **Water containing product produced by the GIT.**

- **Water, undigested feed materials, bile pigments, bile salts, inorganic salts, cells of intestinal mucosa, bacterial fermentation products & bacteria in large numbers.**

Indications

1-Diagnosis of some parasitic disease of GIT through detection of ova, larvae or intact worms.

2-Some bacterial disease as Johne's disease, salmonellosis & Colibacillosis.

3-Some viral disease as rota, corona and BVD.

4-Chemical examination for detection of blood or fats.

I. Macroscopic Examination

Species	Color, odour & consistency
Equine **Dry feed** **Grazing**	**Yellowish brown firm** regular balls **Dark green soft** regular balls and of slightly **unpleasant odour**
Catt& Bufa. **Dry feed** **Grazing**	**Dark brown firm** flat cakes **(balls in camel)** **Dark green soft** flat cakes **(balls in camel)** and of slightly **unpleasant odour**
Sheep & goats	**Dark green to black firm** spherical pellets and of slightly **unpleasant odour**
Dogs & cats	Firm elongated cylindrical masses **of dark brown or light gray color** and of **offensive odour**

Abnormal macroscopic features

1. Color:

- **Clay or pale feces:** **Impaired bile production as in obstructive jaundice.**
- **Blackish brown:** **Constipation.**
- **Some medication:** **Bismuth (black), calomel (green) and phenothiazine (red)**

2. Consistency:

- **Watery:** **diarrhea.**
- **Pasty:** **Cecal impaction (equine) & rumen stasis and abomasal displacement (rumina.)**

3. Presence of blood:

- **Bright red (colon or rectum), dark tarry (upper GIT) and streaks (coccid. & CP).**

3.Presence of indigestible food materials:

- **Parasitic infestation or digestive disturbance.**

4. Presence of parasites:

- **Intact worm (ascaris), Larva (gastrophilus), tap worm (Taenia) and eggs.**

II. Microscopic Examination

A-Qualitative fecal examination:

1. **Direct Microscopic Examination**
2. **Flotation Concentration Test**
3. **Sedimentation Concentration Test**

B- Quantitative fecal examination:

1. **McMaster Egg Counting Technique**
2. **Modified stall technique**
3. **Baermann’s Technique**
4. **Vaida Technique**

A-Qualitative fecal examination:

1- Direct Microscopic Examination

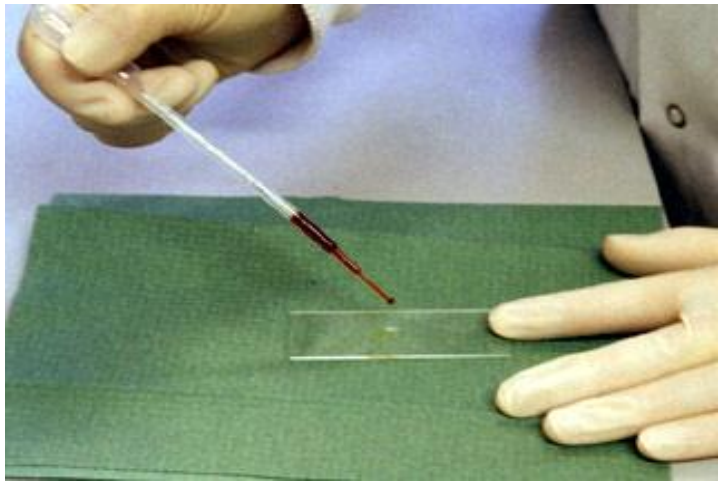
(Fecal smear)

1;2 drops Saline

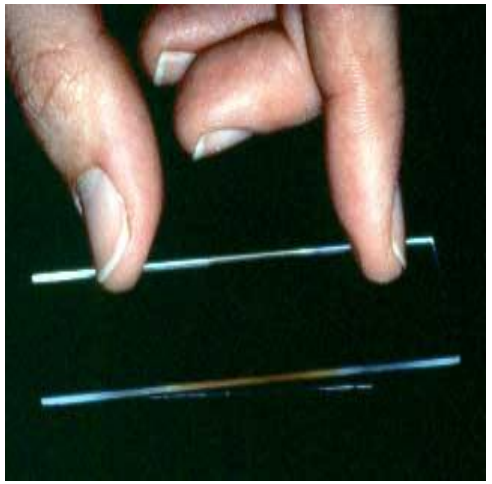
few mg Feces

Mixing discard any debris until the fecal film become transparent

Cover slide



Or Lugol's iodine (motility and internal structure of protozoal oocyst)



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A. Advantages:

1. Rapid & simple screening test & Need few mg of sample.
2. Convenient in equipment and time.
3. Detect eggs and larvae of all parasites.

B. Disadvantages:

1. Can not detect eggs in case of mild infestation.
2. Need 3 successive negative results to insure negative.

2. Flotation Concentration Test

1. Indications

- Nematodes
- Cestodes
- Protozoal oocyst

2. Principle

- Sp. Grav. of water 1 and of nematode and Cestodes is 1.1 : 1.2 using flotation soln. of SG more than eggs; the eggs will float.

3. Flotation solutions used

- Saturated salt & sugar solution
- Sodium nitrate solution (NaNO3 solution)
- Zinc sulfate solution (ZnSO4 solution)
- Magnesium sulfate solution (MgSO4 solution)

Procedures

Equipment

1 gm. feces , 10 ml of concentrated salt solution

Sieving

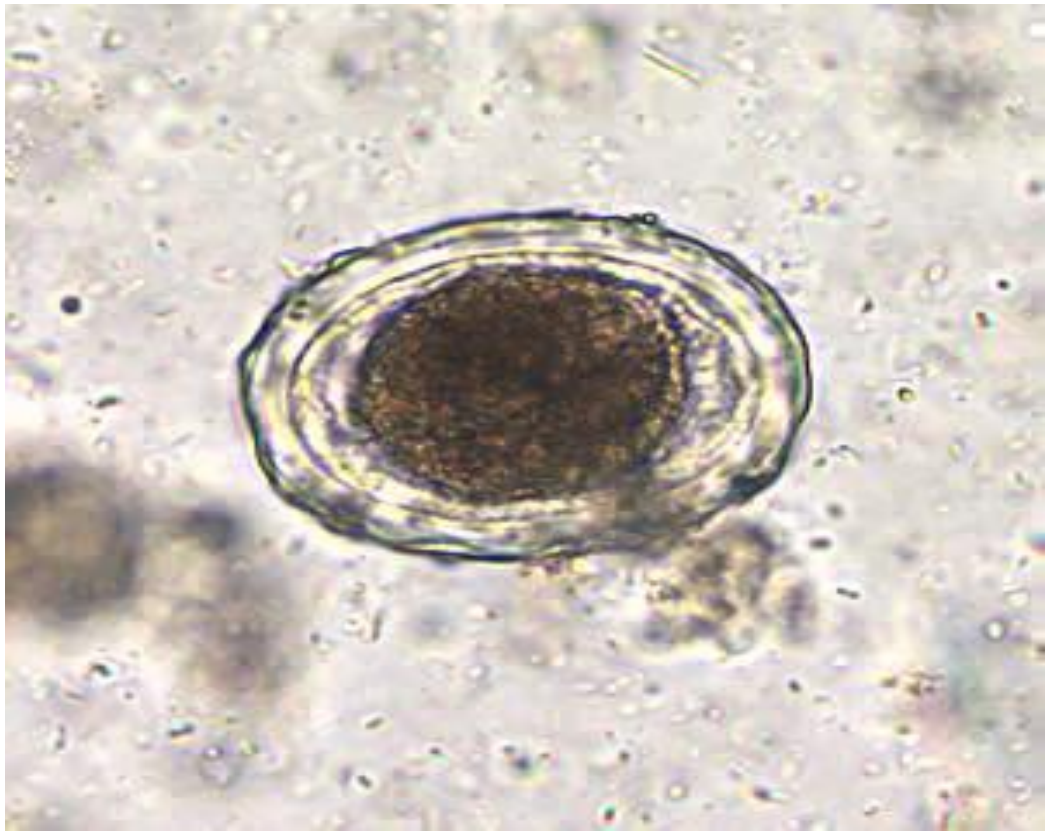
Transfer into clean T.T.

Complete the tube with flotation solution.

Touch surface with coverslip

Centrifuge 1500 rpm/5 min.

Put coverslip on glass slide



Ascaris “double wall – serrated outer membrane – concentric embryonic cell”

3. Sedimentation Concentration Test

1. Indications

- Trematodes eggs as Paramphistomum & liver fluke (Fasciola).

2. Principle

- Specific gravity of water 1 & Specific gravity of Trematode is 1.3 : 1.5 (eggs will sink).

N.B. Flotation solutions used

- Zinc sulfate solution (ZnSO4 solution) and Zink chloride (Zn Cl).

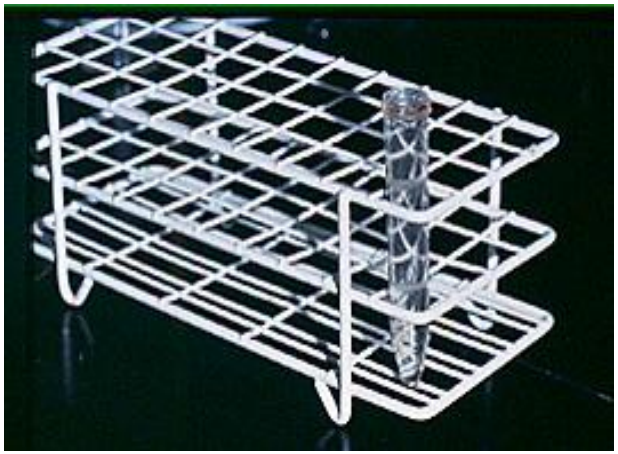
Procedures

Equipment

1 gm. feces , 10 ml of water

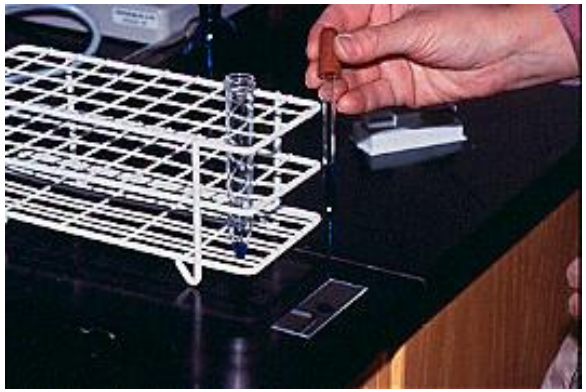
Sieving

Transfer filtrate into test tube

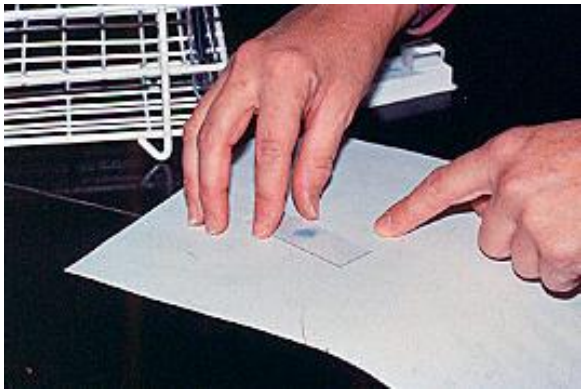


Allow test tube to stand for 20 minutes

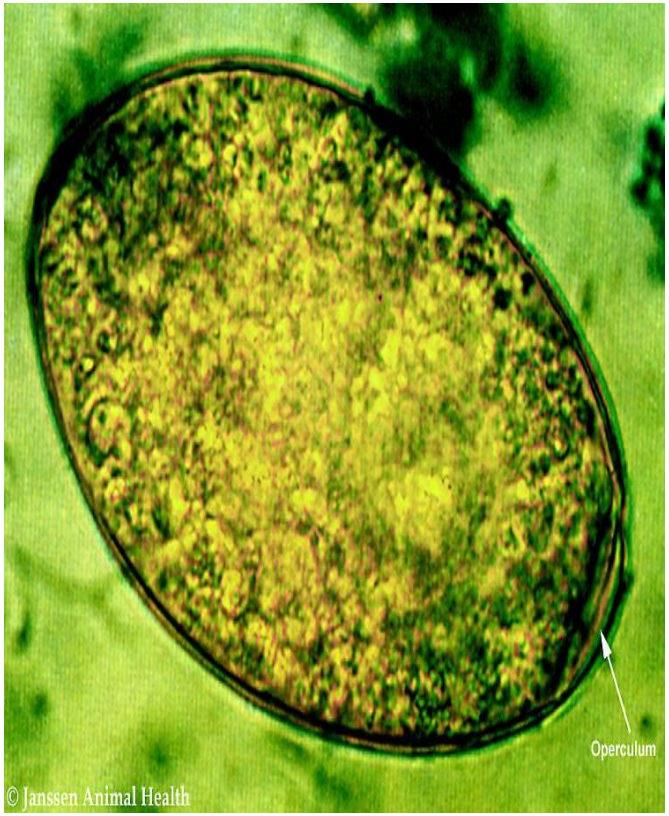
decant supernatant resuspended the sediment in the same amount of water, this is repeated twice at least or until supernatant become clear,



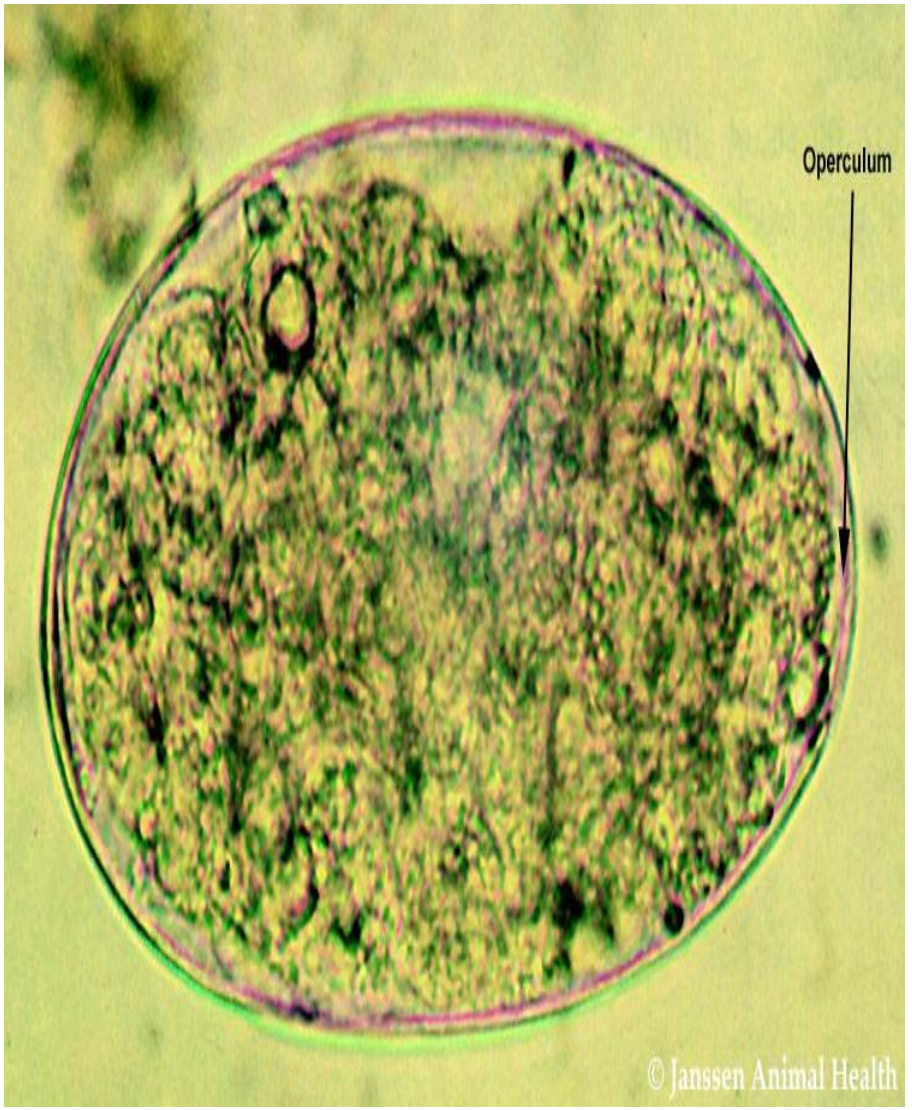
Drop of sediment + Methylene blue



Examine with microscope



Fasciola



Paramphistomum

Items	Fasciola	Paramphistomum
Size	Small	Large
Color	Golden yellow except equine and camel “no bile”	Transparent
Operculum	Not clear at one pole	Operculated
Embryonic cell	Compact and no space between it and egg membrane	Circular, coarse with space between it and egg membrane

B. Quantitative fecal examination:

1. McMaster egg counting Technique

- It is rapid and recommended in all routine fecal analysis.

1. Principle

- Quantitative technique to determine the number of eggs per gram of faeces

2. Application

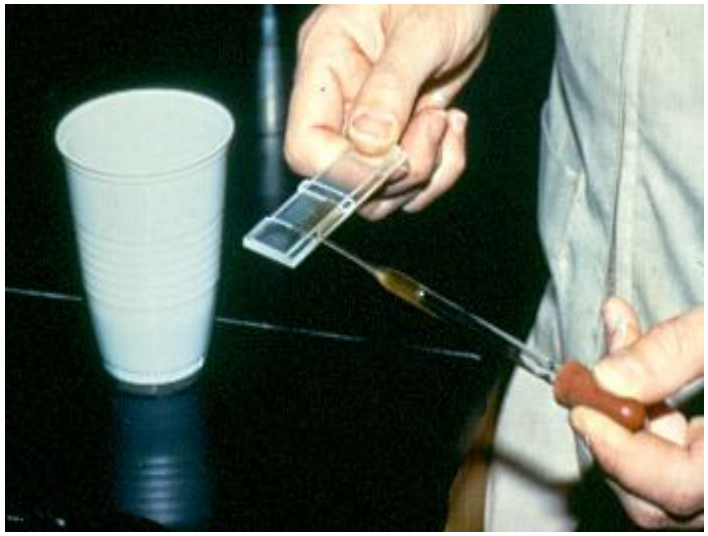
- This technique can be used to provide a quantitative estimate of egg output for nematodes, cestodes and coccidia.

Procedures

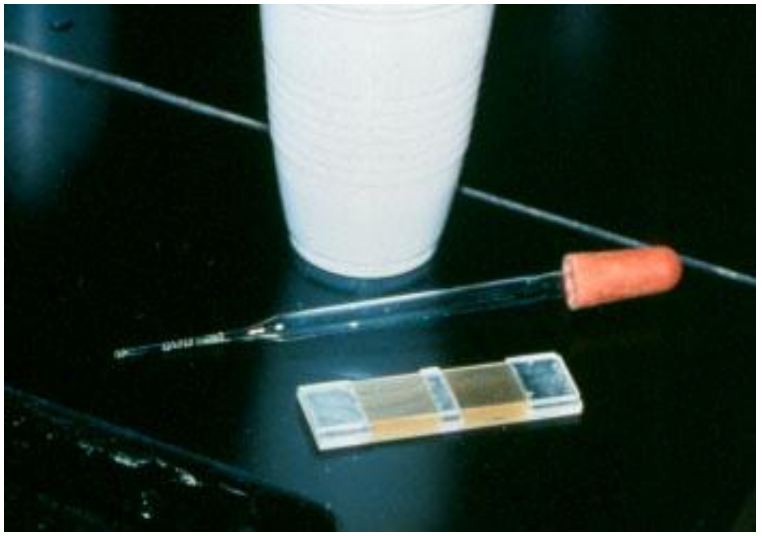
2 gm. Feces

Add 28 ml of salt soln. and add about 20 glass balls to enhance mixing

Sieving



By Pasteur pipette
Fill both side of MacMaster count chamber with filterate

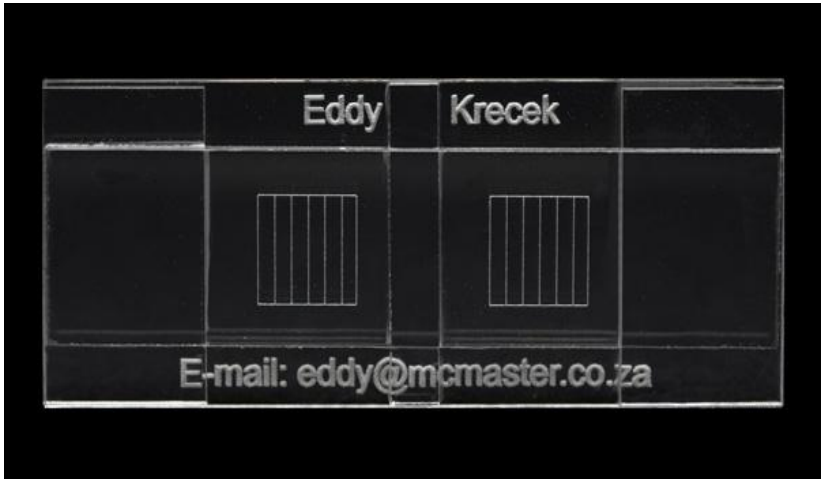


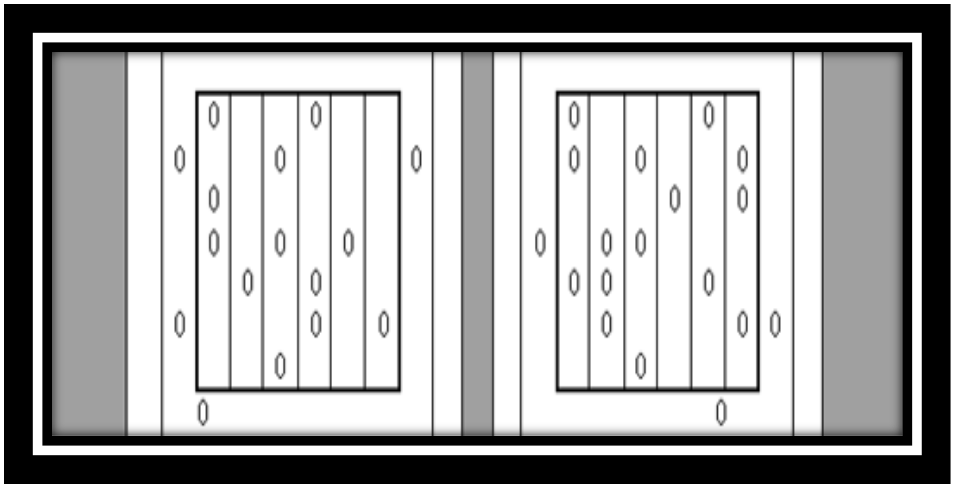
Allow counter chamber stand for 5 min

Examine under the microscope and count the eggs or oocysts

Calculation

$$\text{Number of Eggs Per Gram (E.P.G)} = \frac{(N1 + N2) \times 100}{2}$$





2. Modified stall technique

Procedures

3 gm. Feces

add 42 ml of water and add about 40 glass balls to enhance mixing

Sieving

stirring the filtrate and with a pipette then take 0.15 ml

Put on slide, coverslip put under microscope and calculate the eggs according

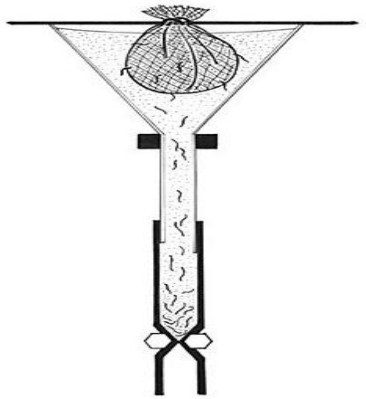
Calculation

Number of Eggs Per Gram (E.P.G) = N × 100

3. Baermann's Technique

1. Indications

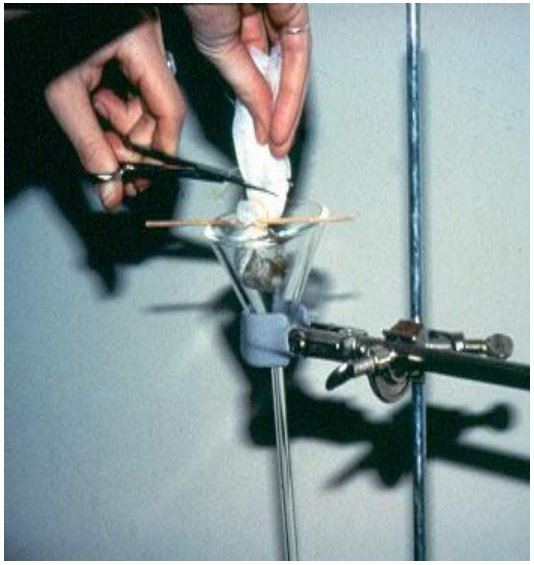
- DD of different nematodes through hatched eggs
- Diagnosis of lungworms and GIT worms



2. Principle

- Based on the active migration of larvae from faeces suspended in water and their subsequent collection and identification

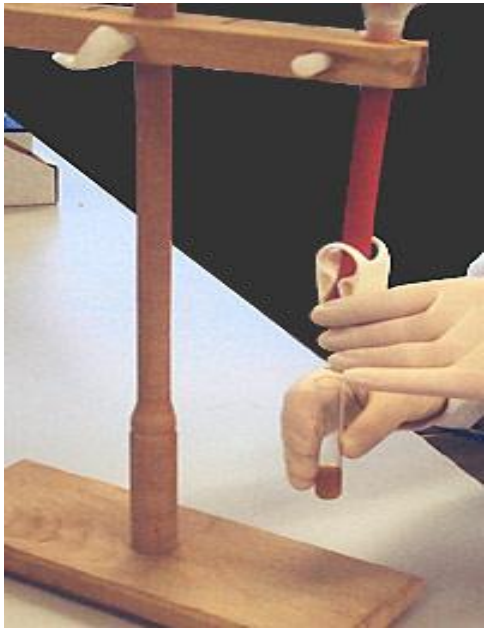
Procedures

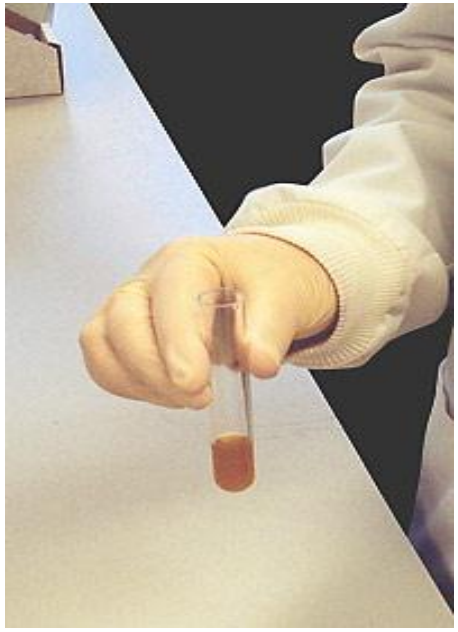


Put few mgs of feces in gauze or filter paper which put in a metal sieve

Pouring warm water into glass funnel which contain rubber tube contain a metal clip end in glass beaker to collect the filtrate

Incubate this apparatus at 37 °c for 24 hours



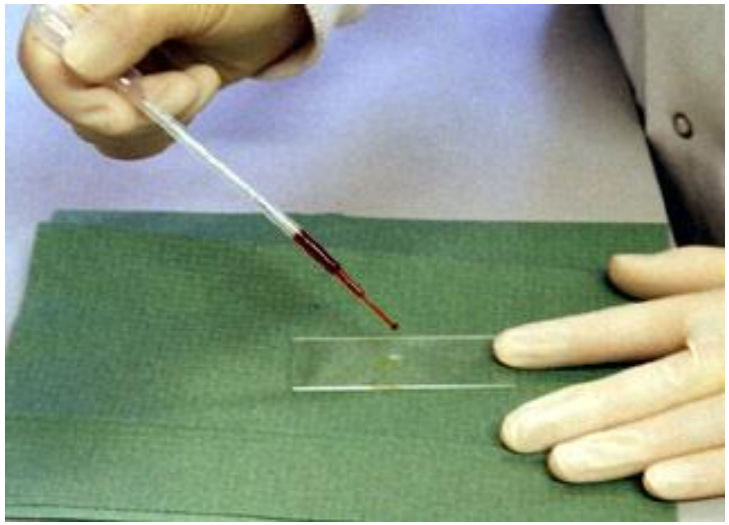


OR

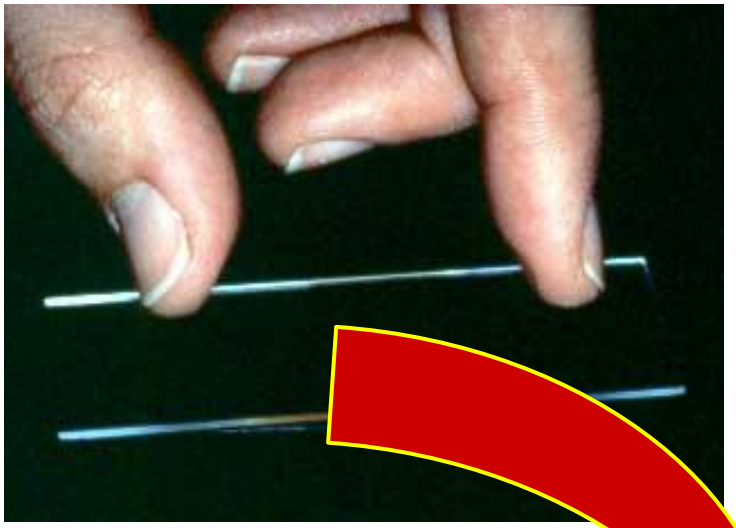
Open metal clips if the larvae present in feces it move though gauze and funnel and collected in beaker

Leave for 30 min

Centrifugation



Drop of sediment and lugol's iodine



Cover slide

Examined for the larvae and count them

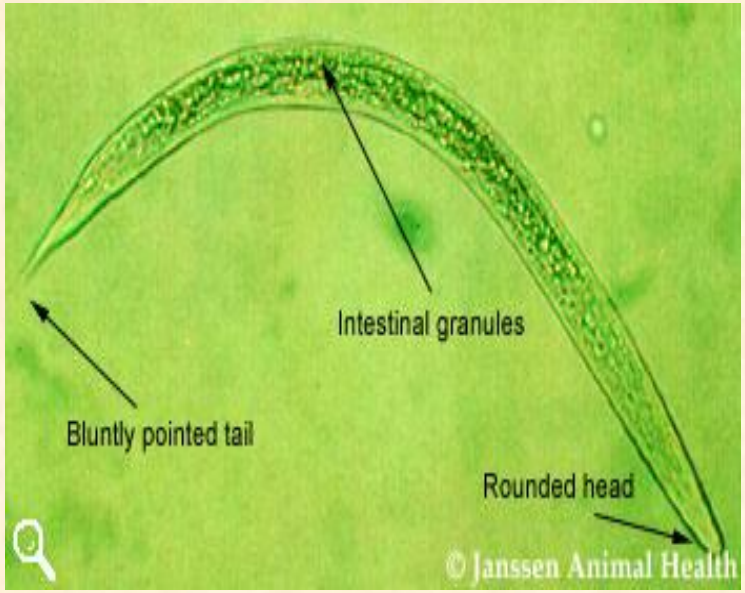
4. Vaida Technique

1. Indications

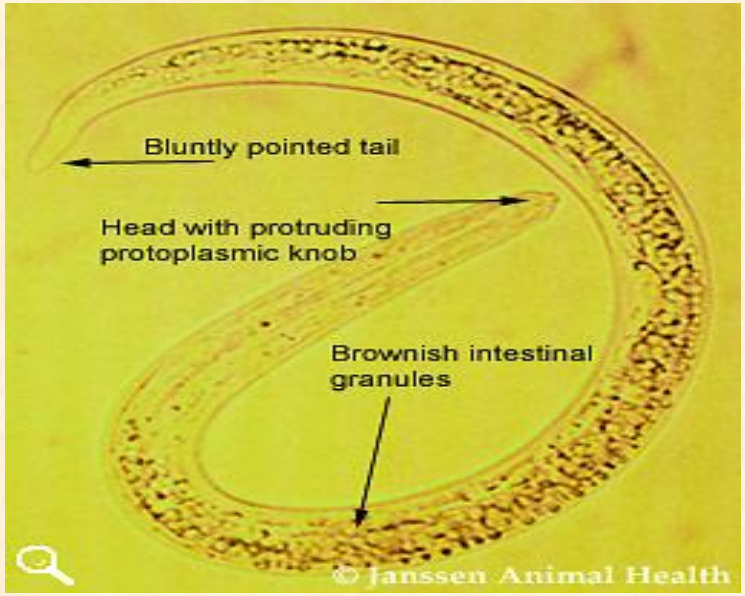
- Used for diagnosis of lungworm in sheep and goat

2. Procedures

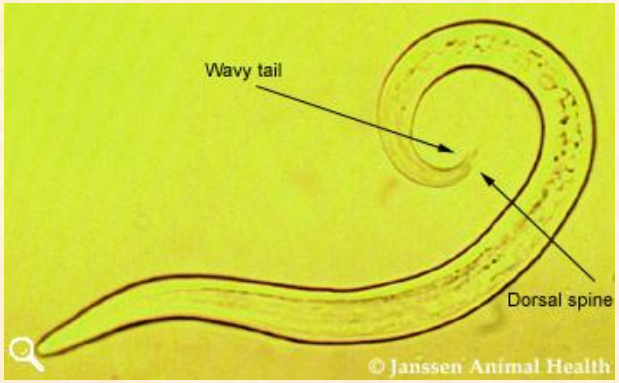
- Put about 5-7 fecal pellets in a petridish which contain few drops of warm water (Leave for about 15-30 minutes).
- Discard the pellets by forceps and examined the fluid for the larvae and count them under low power (10 X) for presence of motile larvae.



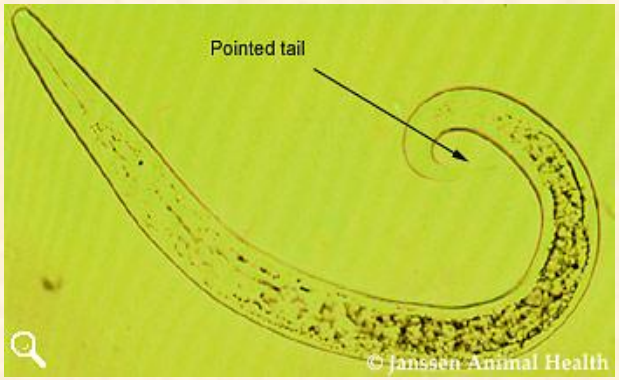
Dictyocaulus viviparous
Curved – Sluggish movement
Round head – Blunt pointed tail



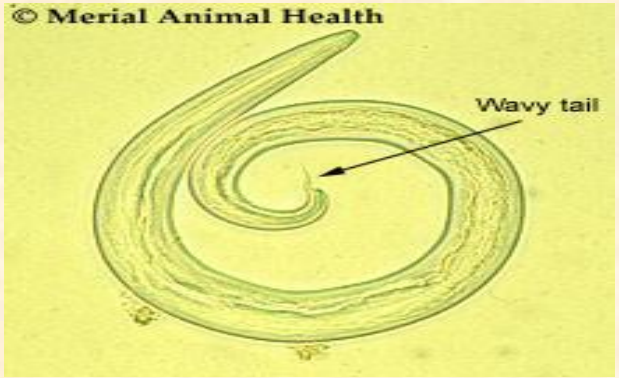
Dictyocaulus filaria
Curved and coiled – Sluggish movement
Protrude head with protoplasmic knob – Blunt pointed tail



Muellerius capillaris
Curved – Pointed tail with dorsal spine



Protostrongylus
Curved – Pointed tail without any spine



Cystocaulus
Curved and coiled – Pointed tail with dorsla and ventral spine

Fecal culture

1. Principle

- Provide a suitable environment for the hatching and development of helminth eggs into the infective stage (L3).

2. Application

- Differentiation of many nematode that cannot be clearly differentiated from the eggs in fecal samples.

Procedures

- Incubate the fecal sample in petridish at 37 °c .
- Spread the fecal sample to form a depth of 0.8 cm.
- Make 4 wells 1 in each quadrant with 0.5 cm (glass rod).
- Fill wells with water, incubate at 37 °c for 4-5 days.
- Withdraw few amount of fluids in the wells by pipette.
- Put on slide and examined under microscope.
- We can put sawdust on the fecal samples in petridish to allow aeriation and the fecal samples can be examined daily for presences of larvae and can differentiate them.

Drawbacks or disadvantages of Fecal examination

1. Eggs not equally distributed in fecal sample so missing of ova may occurs.
2. Egg laying capacity of worms vary according to season
3. Stress factors “Pregnancy – Parturition” affect egg laying capacity-
4. Host health state affect laying capacity of the nematodes.
5. Eggs will not appear in case of immature worm infection.
6. Anthelmintic therapy reduced worm population
7. Number of fecal eggs are not true guide to total number of intestinal worms i.e. when large number of worm present in intestine egg laying capacity reduced.