Modern Parasite Control Program for Horses

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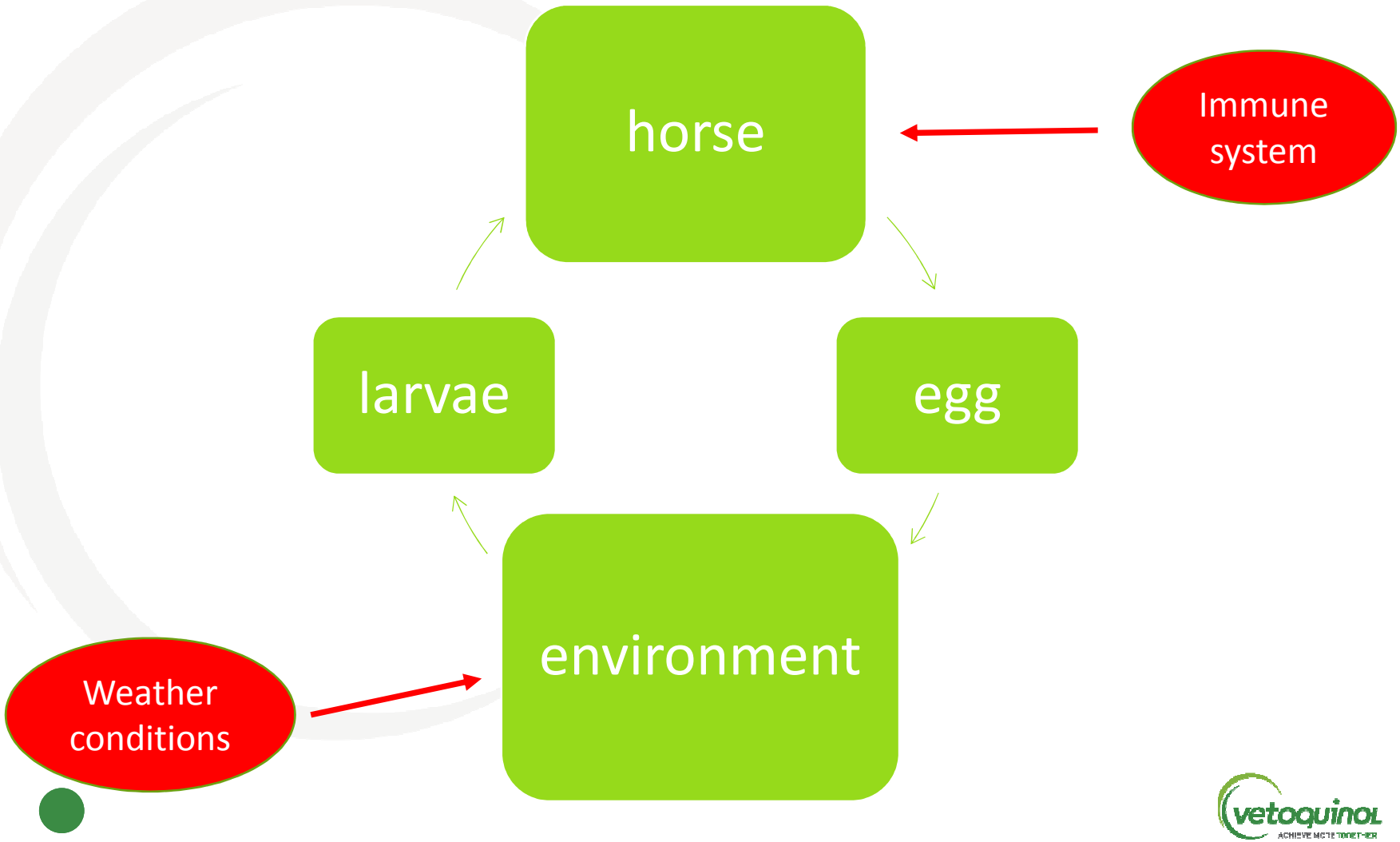
Parasites- how to recognize infection?

- Weight loss
- Colic
- Caugh
- Diarrhea
- Depression
- Pot belly

- Rough hair coat
- Decreased immune system function
- Tail rubbing
- Death

Parasitic cycle



Not all horses are the same!

FEC

- Fecal egg count (FEC)
- Results reported as “number EPG”= (parasitic) eggs per gram (of manure)
- The general rule for adult horses (>3 years old) is that on repeated FEC’s (taken 3-4 times/year for consecutive years):
  - → 70-80% are in low to moderate shedding category
  - → 20-30% are in high shedding category

Why do I need to know EPG?

- Low shedders:
  below **200** EPG
- Moderate shedders
  200- 500 EPG
- High shedders:
  over **500** EPG

Not all provinces are the same!

Weather conditions

- Parasitic eggs survive winters
  - → One year survival for strongyles
  - → Five to 10 years for ascarids
  - → Eggs will die in >30 ℃ and low humidity
- Parasitic larvae are more sensitive than eggs
  - → Will die after freezing
  - → Like moisture and temperatures moderate to warm
- Larvae develop from eggs
  - → In as little as 3 days in ideal weather conditions (summer in Canada)
  - → In as long as weeks in less ideal conditions: early spring, late fall, winter

Happy parasite requires:

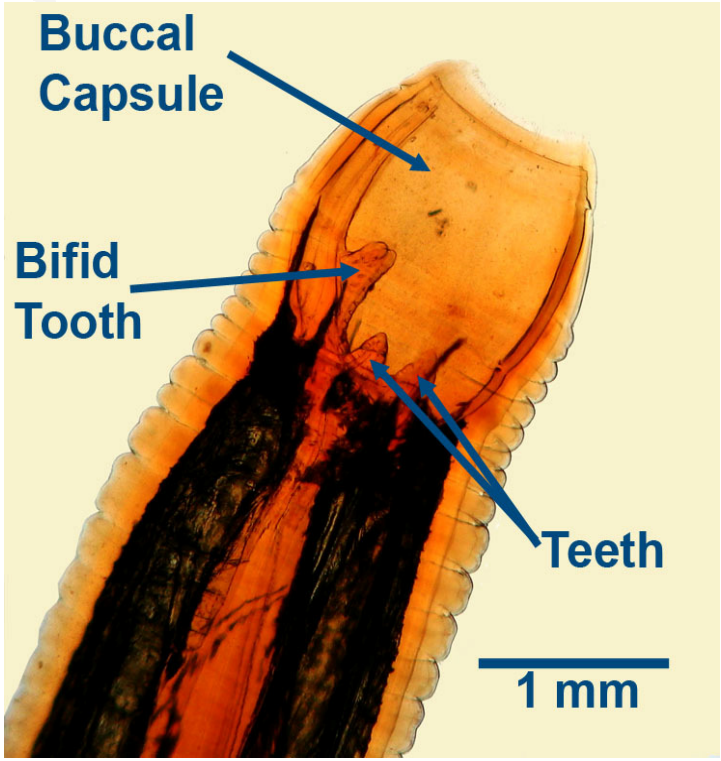
- Susceptible horse
- Favourable environment and weather conditions

Who's the enemy?

- Large strongyle (large redworm)
- Small strongyle (small redworms, cyathostomins)
- Ascarids (*Parascaris equorum*)
- Tapeworms
- Bot flies (*Gasterophilus*)
- Pinworms
- Other…

Large strongyle

Strongylus vulgaris, Strongylus edentatus, Strongylus equinus



Large strongyle egg

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Large strongyle= bloodworm

- The longest life cycle: minimum 6 months from eating larvae to shedding eggs by a horse
- No known resistance to dewormers
- Silent killer: larvae live in blood vessels which supplying blood to large intestine:
  - → **Colic** a result of “heart attack” type of event in intestine:
    - Cut off blood supply leads to dying off of a part of gut
    - Necrotic intestine causes severe infection in abdomen
    - Requires surgery
- Difficult to diagnose
- Mostly eradicated in well managed herds

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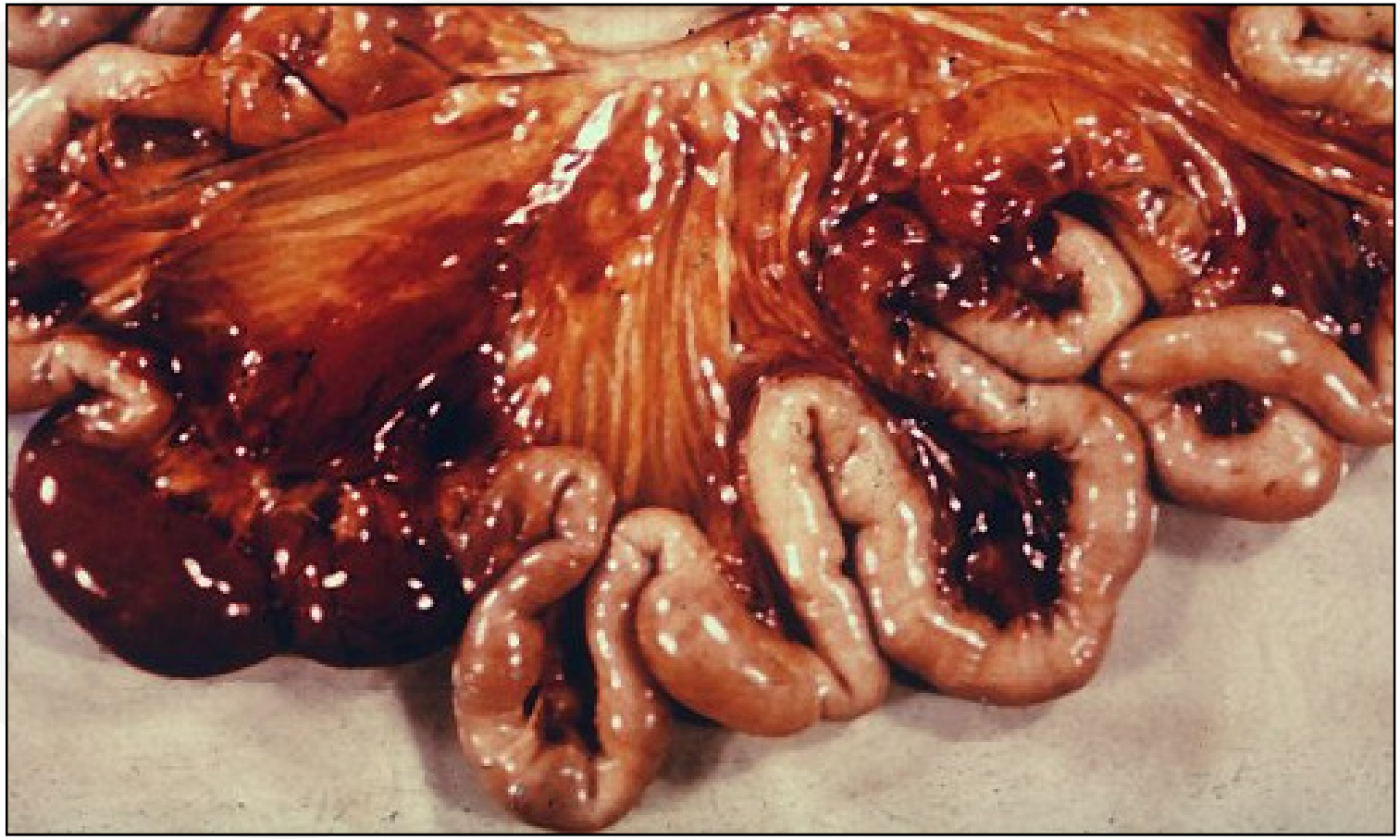
Large Strongyle (bloodworm)



Large strongyle

- Diagnostic options:
  - limited, not readily available
    - FEC limitations: egg looks the same for large and small strongyle
    - Pooled fecal samples: goal to harvest larvae from eggs
      - Morphological larval identification
      - PCR
  - Newest test developed in Kentucky by team lead by Dr. Martin Nielsen
    - Blood test: looks for large strongyle larval antigen
    - Not yet commercially available

Small strongyle/ Small redworm/ Cyathostome

- Over 40 species
- **HYPOBIOSIS**= winter sleep that can be as long as 3 years
- **ENCYSTED** larvae
- Short life cycle: 2 months from eating a larvae by a horse to shedding eggs

http://www.stephenbrooksequine.co.uk/Worming-bl5.htm
http://liphookequinehospital.co.uk/news/2014/04/concern-over-encysted-small-redworm-disease

Small strongyle egg

Count matters!

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FEC

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  below **200** EPG
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Larval Cyathostomatosis

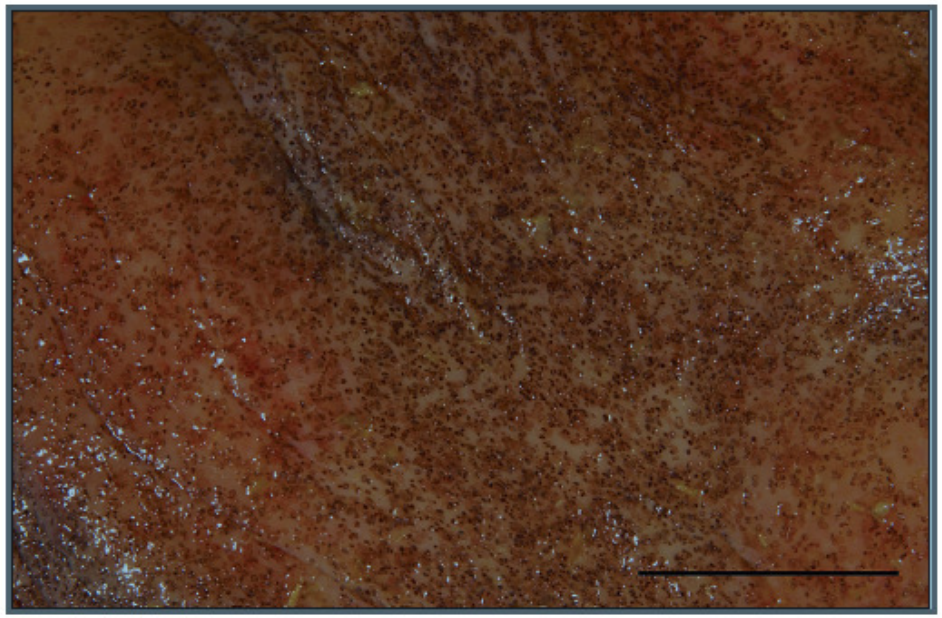
- Clinical disease due to presence of large numbers of encysted larvae
- Which leads to inflammation and damage to intestine
  → Diarrhea and swellings in severe cases
- The goal is to prevent this from happening
  → Treatment of clinically affected cases difficult

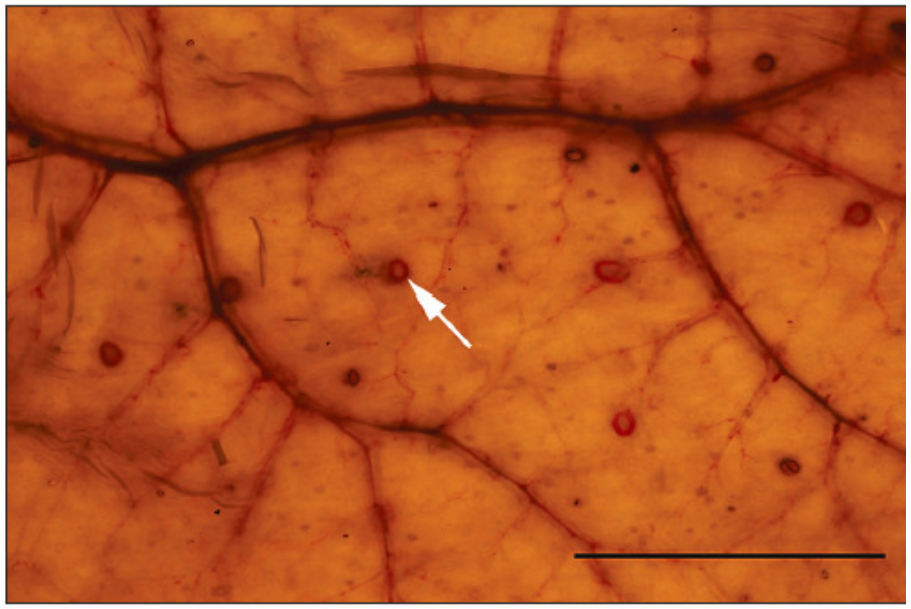
Veterinarni Medicina, 55, 2010 (4): 187–193

Equine cyathostomosis: case reports

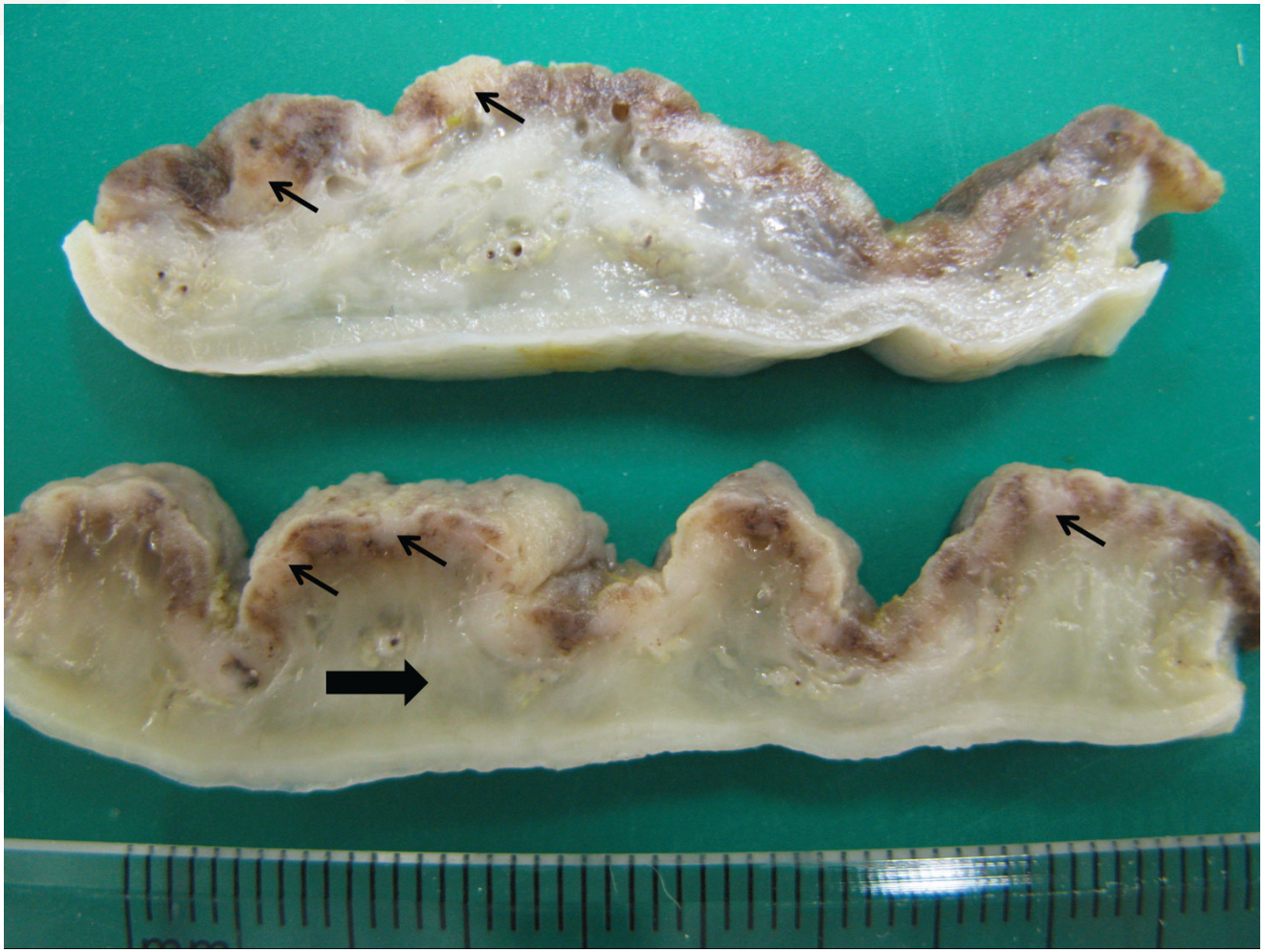
S. Bodecek, P. Jahn, O. Dobesova, E. Vavrouchova

Larval cyathostominosis in horses in Ontario:An emerging disease?
Andrew S. Peregrine, Beverly McEwen, Dorothee Bienzle, Thomas G. Koch, J. Scott Weese
Can Vet J. 2006 January; 47(1): 80–82





Cyathostominosis in a horse from Saskatchewan
Gary Wobeser, Audrey Tataryn
CVJ / VOL 50 / OCTOBER 2009




Parascaris
Photo courtesy of Dr. Imma Roquet

Parascaris univalens (ex- equorum)

- Ascarid/ large roundworm
- **Bad news**
- Survives in environment 5-10 years
- Tough egg, larvea protected

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Parascaris univalens

- **BAD NEWS CONTINUES**
- The most prolific of all parasites
  → 1 adult female worm = 100 000 to 200 000 eggs per day!
- Hard to kill: dewormer resistance issues
- The biggest parasite in the smallest horse in the smallest gut
- Larvae travel within the horse through the liver and lungs.

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Ascarids

Parascaris univalens

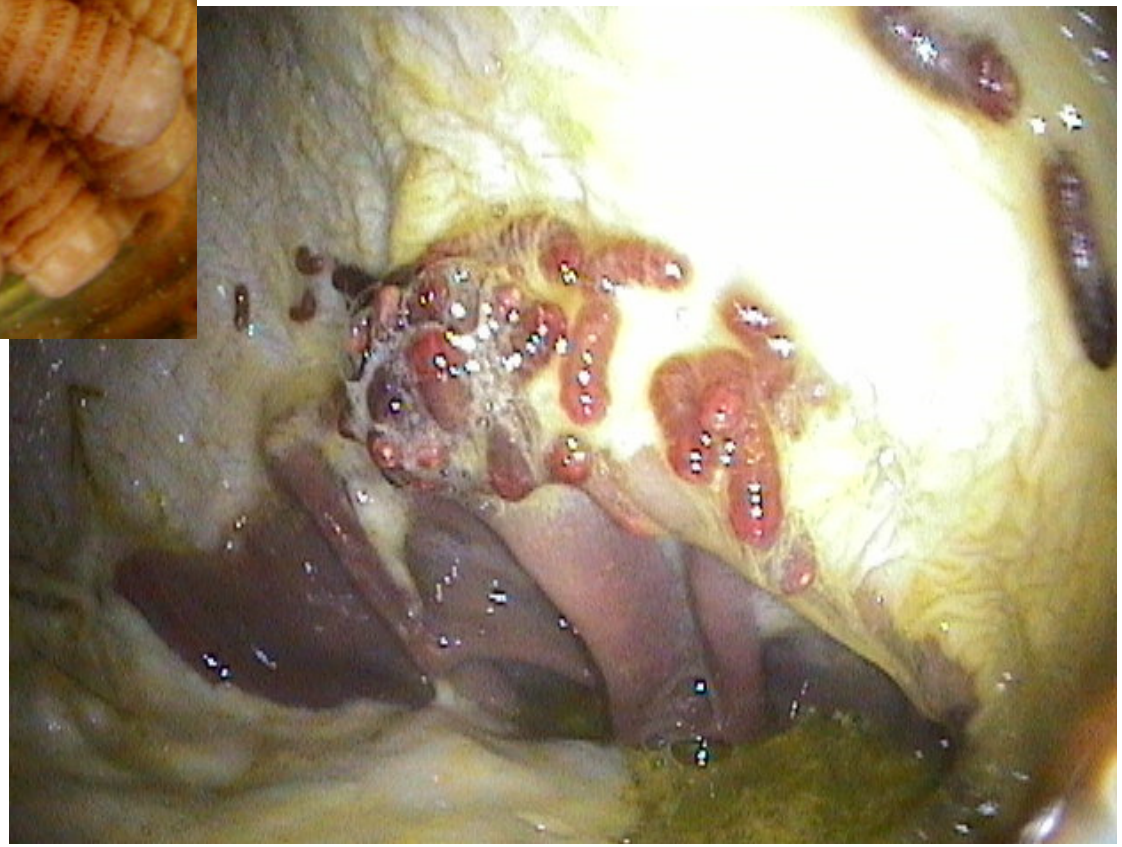
photo credit: https://www.facebook.com/HoejgaardHestehospital/

Bot flies*: Gastrophilus* spp.

Bot flies*: Gastrophilus* spp.

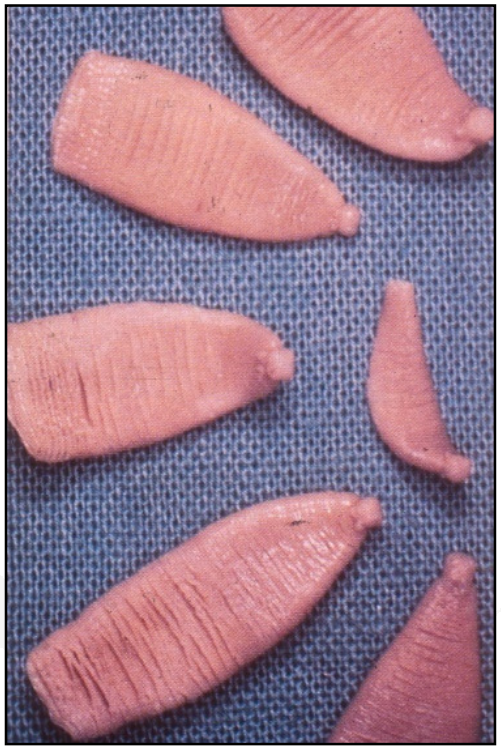
- Eggs seen on legs and mane- can be removed with a brush
- Eggs swollen and larvae may develop within oral cavita (buccal surface, gingivia)
- Larvae often found in stomach during gastroscopy


2cm



Tapeworms

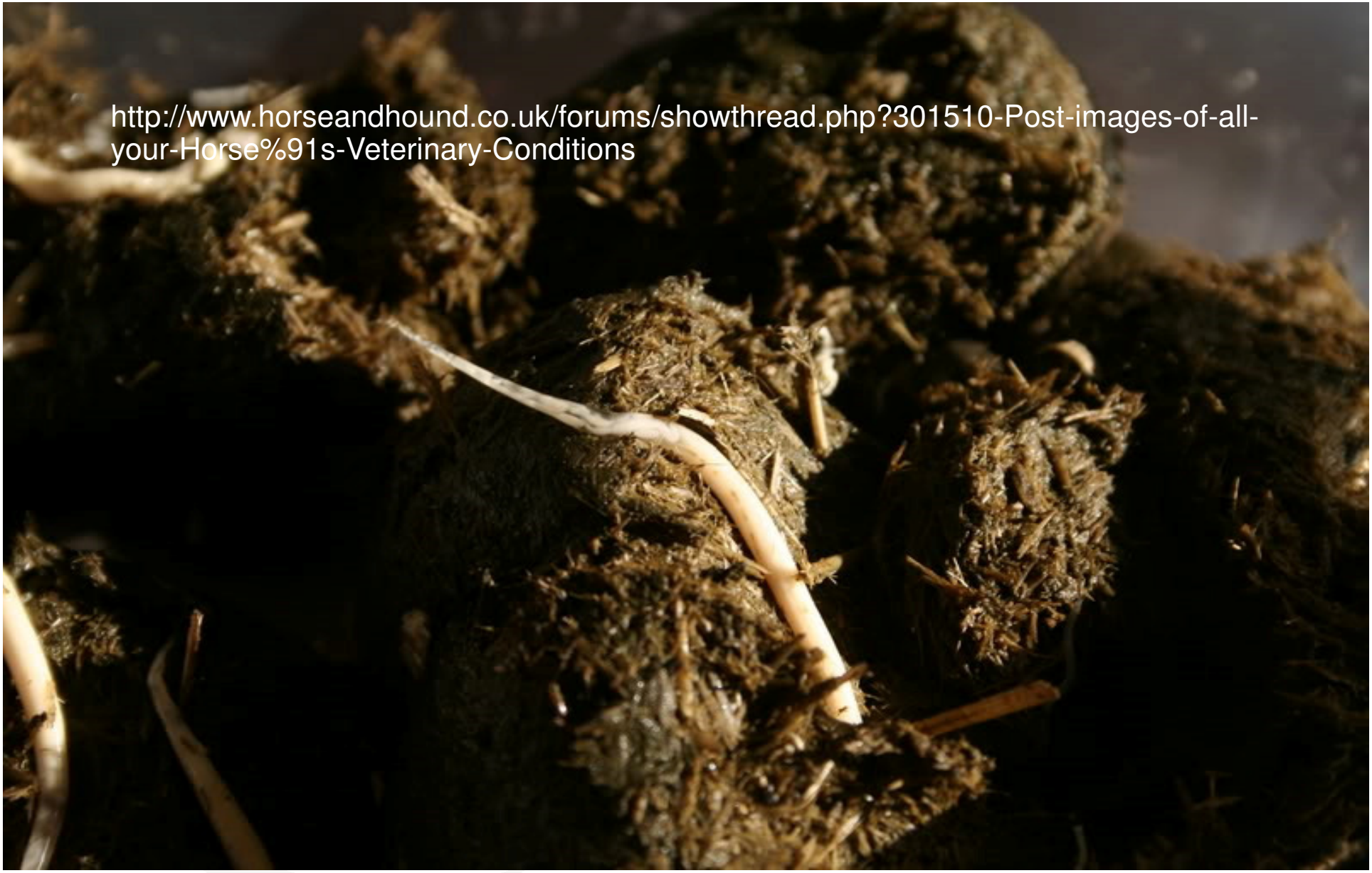
- ***Anoplocephala perfoliata***



Tapeworms

- Diagnostic challenge:
  - → Eggs shed intermittently: consecutive sampling required
  - → Blood test checks for antibodies= does not confirm current infection
  - → Best available test: fecal sample 24-30 hrs after deworming with tapeworm-killing drug
    - Praziquantel
    - Double dose of pyrantel
- Transmission via soil mite
- Tapeworms may lead to colic
- Preventative treatment once yearly- breaks down the cycle of the parasite

Pinworm
Oxyuris equi


http://www.horseandhound.co.uk/forums/showthread.php?301510-Post-images-of-all-your-Horse%91s-Veterinary-Conditions

Pinworm

- May cause tail rubbing
- Scotch tape test
- If positive, deworm (ask your vet which product is best choice) and:
  - → Wash the anal area and tail to remove potential sticky residues of pinworm eggs
  - → Two weeks post deworming repeat scotch tape test
    - Discuss findings with your vet for further guidance

Donkey Lungworm: Dictyocaulus arnfieldi

- May cause chronic respiratory symptoms in a horse
- While donkey remains healthy
- Diagnosis: checking the donkey for presence of larvae in manure
  - → Different technique than FEC;
- In positive cases, treatment of both horse and donkey

RESISTANCE

What is Resistance?

- Parasites survive treatment with a dewormer
- The dewormer no longer “works”
- Resistance is a FARM issue
- Your neighbor has a resistance problem but you may not

Resistance to dewormers

- Different for different ACTIVE compound, not brand name
- Accelerated by under dosing or over using a drug
- Simple and fast test to assess resistance on a farm available at the vet: **FECRT** (Fecal Egg Count Reduction Test)

Resistance factors:

- Natural slow process
- Accelerated by:
  - → Over-treating: too frequent deworming
  - → Under-dosing the dewormer
  - → Use of an ineffective dewormer

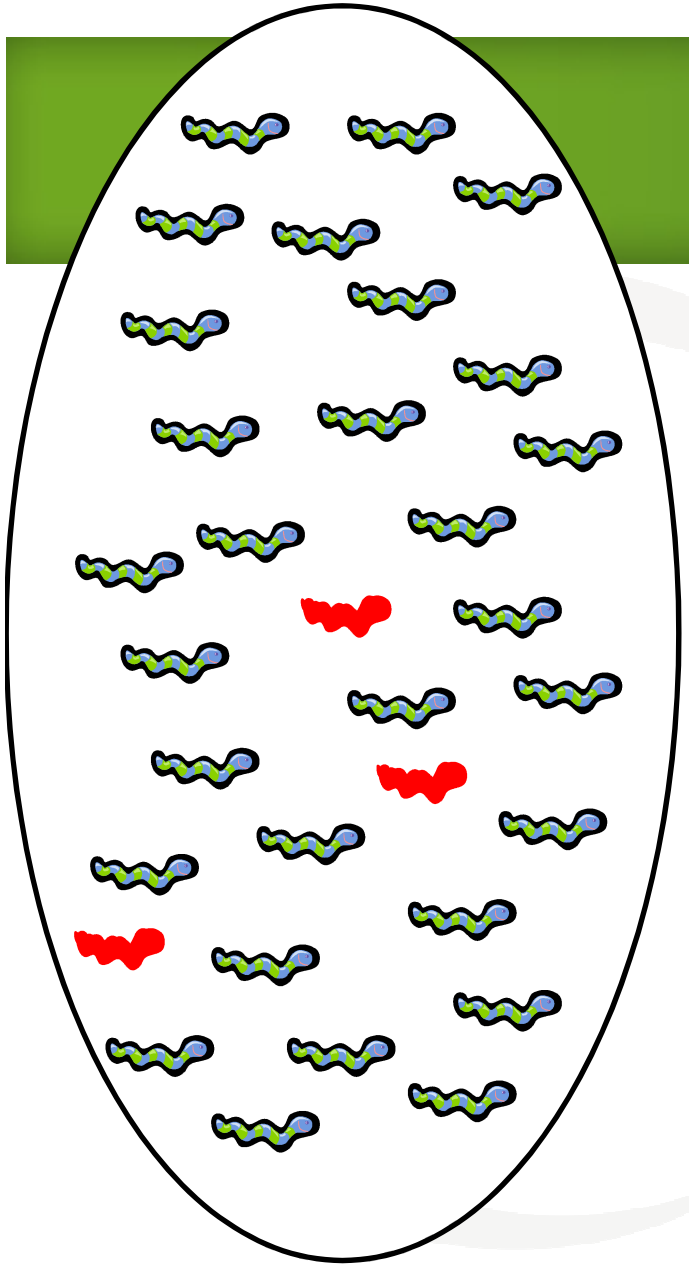
How to know if dewormer works?

- Fecal Egg Count Reduction Test (FECRT):
  - → Take fecal sample just before deworming (the same day or a day before)
  - → Repeat fecal sample 10-14 days later

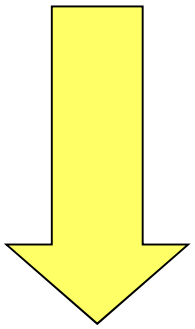
REFUGIA

Refugia?

- ‘Wild’ population of worms
- Not treated with drugs
- Unlikely to carry resistance genes
- Important to have
- ‘Dilutes’ and breeds with resistant population, decreasing or slowing down the resistance.



Deworm

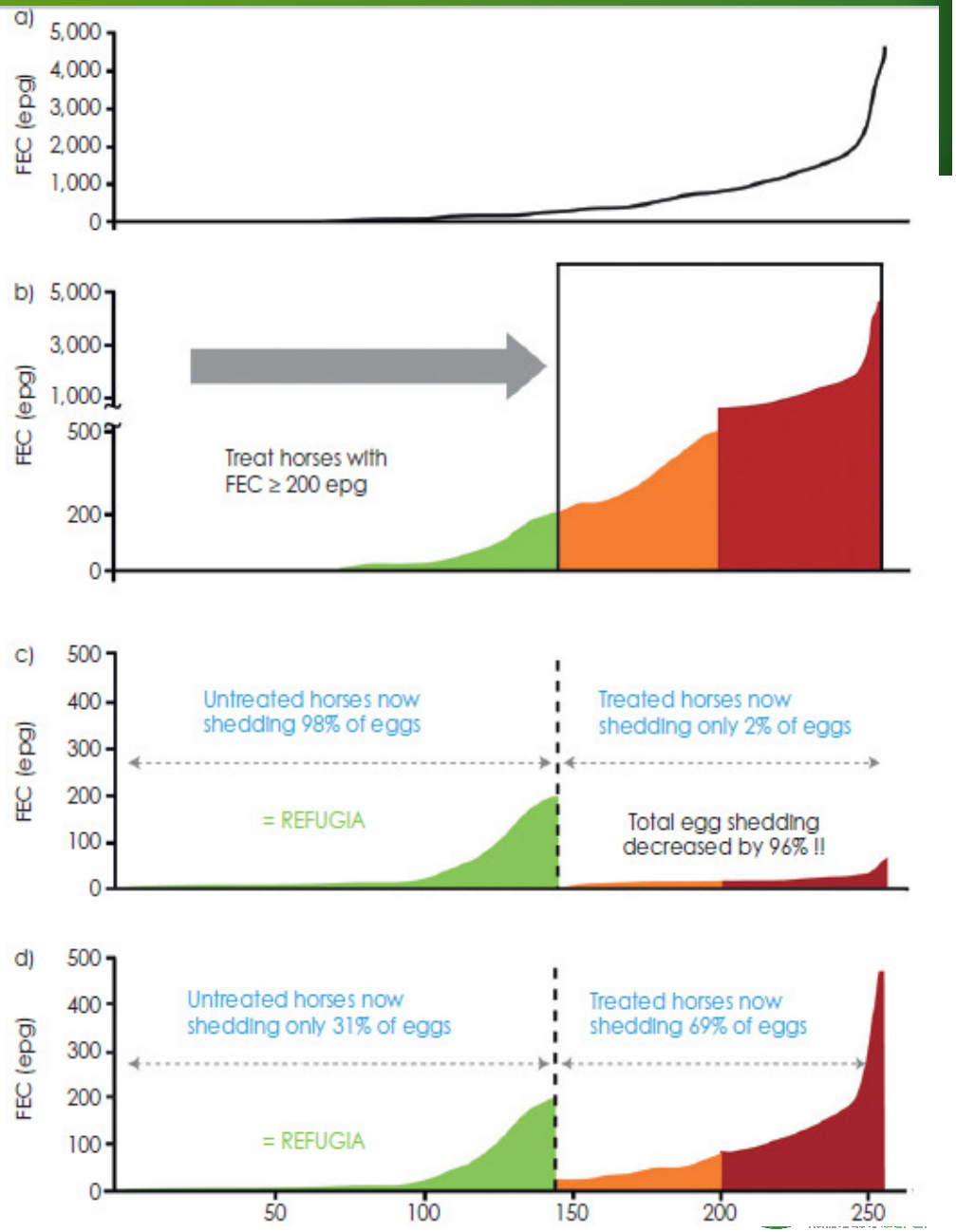


Mix and breed with **Refugia**

*R. M. Kaplan, M. K. Nielsen, Equine vet. Educ. (2010) **22** (306-316*

- Shedders/Eggs:
  - Low: 55%/**4%**
  - Moderate: 18%/**13%**
  - High: 27%/**83%**

- c) 99.9% effective dewormer
- d) 90% effective dewormer



Strategic Parasite Control

- Pasture management
  - → Healthy sensitive refugia
- Choose effective products
  - → Based on risks and FECRT
- Treat with appropriate frequency
  - → Based on EPG
- Monitor program efficacy
  - → Perform a FECRT occasionally

Wormer Class	Active Compound	Trade Name
Benzimidazoles	Fenbendazole Oxybendazole	Safe-Guard, Panacur, Anthelcide
Pyrimidines	Pyrantel	**Exodus** Strongid
Macrocyclic Lactones (ML's)	Ivermectin Moxidectin	**Bimectin, Equimax** Eqvalan, Panomec Quest, Equell

Equine Dewormers

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Thank you