Modern Parasite Control Program for Horses

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Parasites - how to recognize infection?

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

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

- Horse
- Larvae
- Egg
- Environment

Factors:
- Immune system
- Weather conditions
Not all horses are the same!

80/20 rule
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°C 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
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
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
Small strongyle egg
Count matters!
FEC

- Low shedders: below 200 EPG
- Moderate shedders: 200-500 EPG
- High shedders: over 500 EPG
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
Equine cyathostomosis: case reports
S. Bodecek, P. Jahn, O. Dobesova, E. Vavrouchova
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
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.
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
Tapeworms

- Anoplocephala perfoliata

Equine Parasites & Wormers
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*
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?

- ‘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.
Mix and breed with **Refugia**
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
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<thead>
<tr>
<th>Wormer Class</th>
<th>Active Compound</th>
<th>Trade Name</th>
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<tbody>
<tr>
<td>Benzimidazoles</td>
<td>Fenbendazole</td>
<td>Safe-Guard, Panacur, Anthelcide</td>
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<td></td>
<td>Oxybendazole</td>
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<td>Pyrimidines</td>
<td>Pyrantel</td>
<td>Exodus</td>
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<td>Strongid</td>
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<td>Macrocyclic Lactones (ML’s)</td>
<td>Ivermectin</td>
<td>Bimectin, Equimax</td>
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<td>Moxidectin</td>
<td>Eqvalan, Panomec</td>
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<td></td>
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<td>Quest, Equell</td>
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Equine Dewormers
Thank you