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Current Recommendations for Best Practices for Deworming Horses

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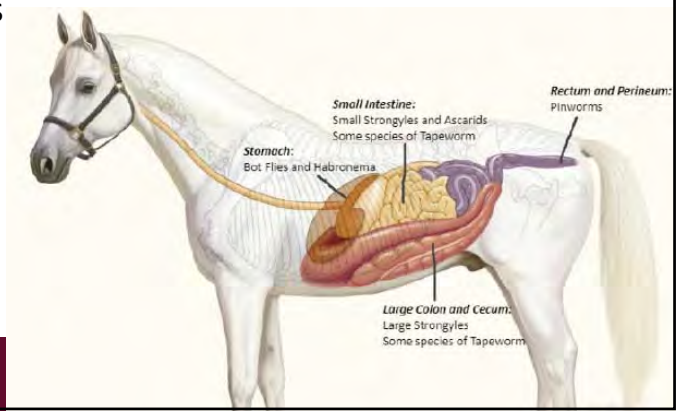
Outline

I. History and Today's Concerns
II. Parasites of interest
III. Designing Deworming Program
IV. Questions



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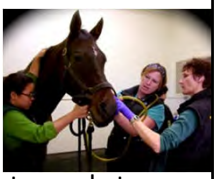
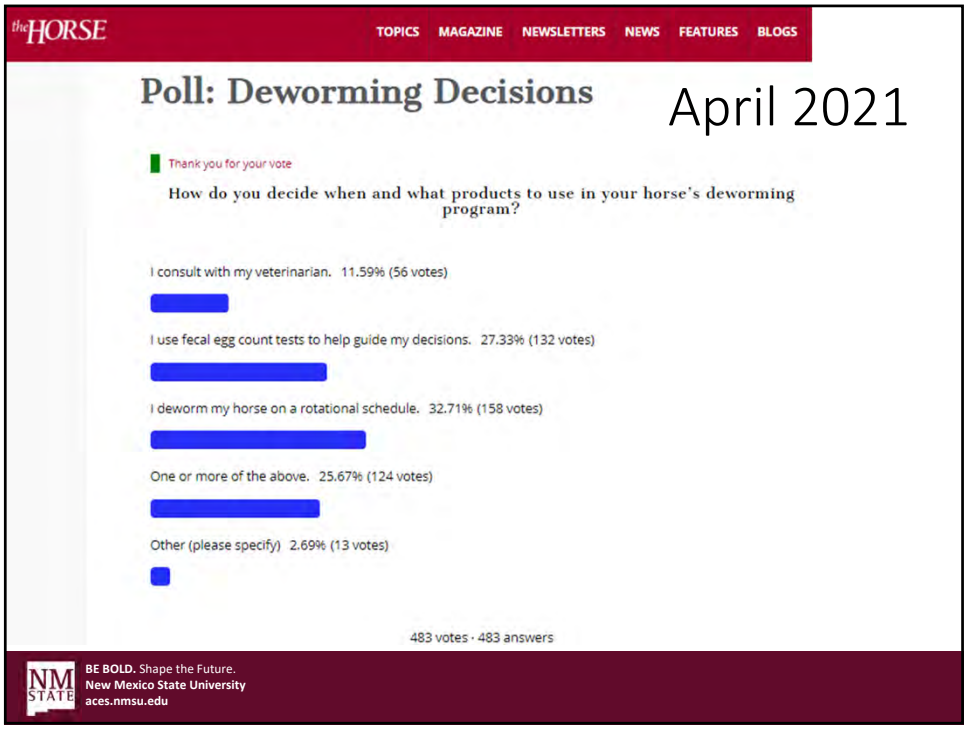
History



- 1940's: Phenothiazine widely used to control strongyles
- 1950-1970's: Large strongyles (bloodworms) are the most devastating internal parasite
- 1950's & 1960's: "Deworming cocktail" given by vet
- 1960's: Strongyles resistant to phenothiazine
- 1960's & 1970's: New broad spectrum dewormers make it to market; no set deworming schedule until 1966 JAVMA article suggests deworming every 6-8 weeks with thiabendazole
- 1970's: Paste formulations become available for administration by horse owners
- 1980's: Ivermectin was introduced to the market; Game-changer as it killed larval forms too
- 1990's: Moxidectin introduced to market
- 2000's: Large strongyles almost eradicated from managed horse herds; some development of resistance from certain parasites to specific anthelmintic drugs; promotion of rotation deworming

Today

- AAEP no longer recommends "deworm every 6-8 weeks"
- Rather, strategic use of testing, drugs, and environmental factors to make complete parasite control program
- Research has identified practices that contribute to anthelmintic resistance or reduced effectiveness of anthelmintic agents.
- These include: high frequency of anthelmintic administration, repeated use a single anthelmintic agent without rotation to another chemical class, under-dosing of the drug by only visually estimating body weight, and administering anthelmintic agents at times of the year when climatic conditions offer a natural alternative to chemical control.
- 2011 nationwide online survey of 11,000 horse owners reported that 99% of owners deworm their own horses, but less than 16% involve their veterinarians in deworming plans.



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Today

- AAEP Goal of parasite control program:
  - Minimize the risk of parasitic disease
  - Control parasite egg shedding
  - Maintain effectiveness of deworming drug
    by avoiding the development of parasite resistance

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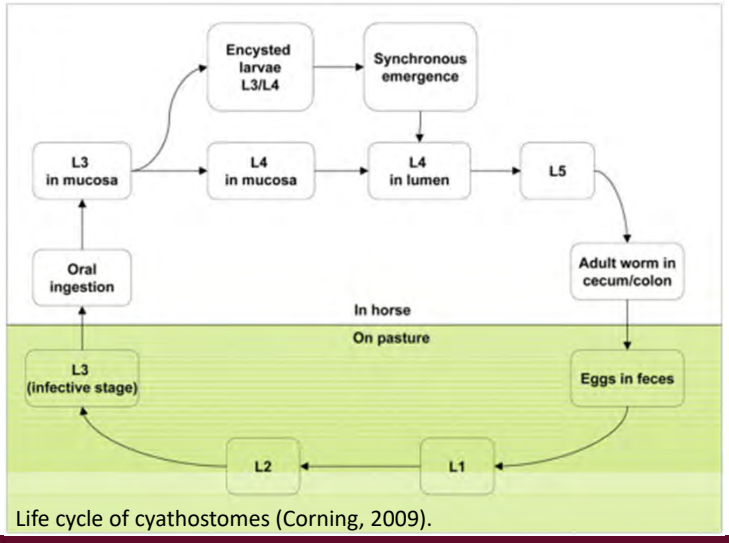
Parasites of Interest

- Large strongyles (Bloodworms)
  - Currently no longer a concern
- Small strongyles
  - The primary concern for all horses
  - The most widely resistant to drugs

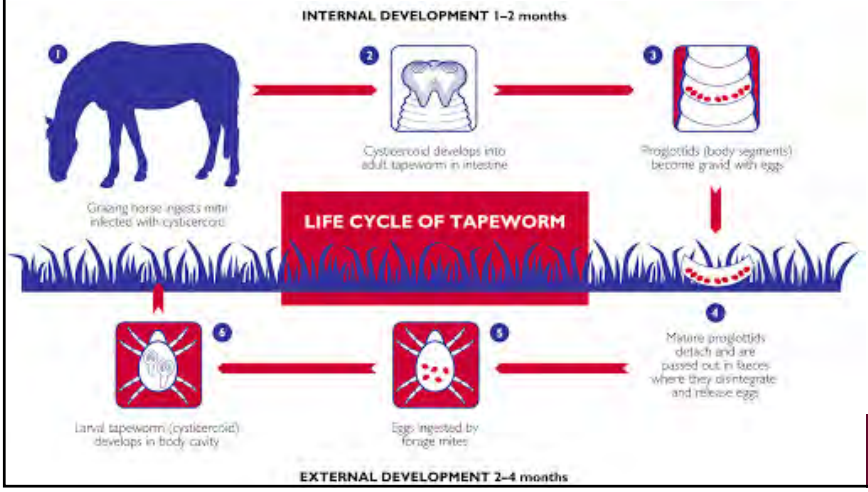
Small strongyle life cycle



Life cycle of cyathostomes (Corning, 2009).

Parasites of Interest

- Tapeworms
  - Could be a concern for pastured horses
  - Hard to "test" for



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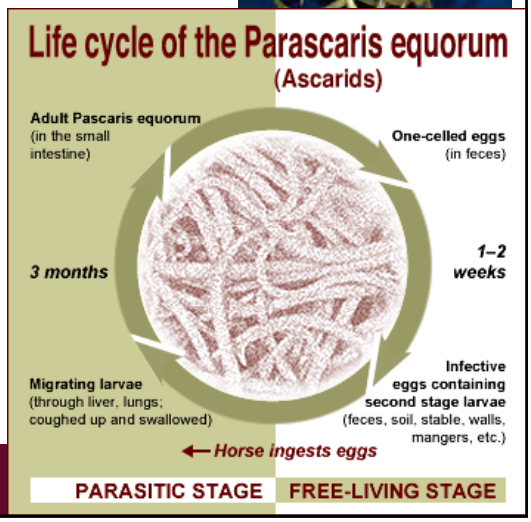
Parasites of Interest

- Ascarids (Roundworms)
  - Adults more "immune"
  - Foals normally infected
  - Contribute to colic
  - Resistant to many drugs
  - Longer lived in ENV
  - Can be acquired in dry lot



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Parasites of Interest

- Oxyuris equi (Pinworms)
  - Adults more “immune”
  - Foals normally infected
  - Contribute to “tail rubbing”
  - Resistant to many drugs
  - Can be acquired in dry lot

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Parasites of Interest

- Bots (Bot fly larvae)
  - “Overwinter” in stomach
  - Ivermectin and moxidectin treat

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Designing Deworming Program

- Important Factors to Consider
  - Age: 3+= more immune to parasites except small strongyle
  - Management: pastures = primary means of transmission
    - Dry lot and hay feeding = less exposure
    - Good practice: clean manure weekly, and compost
      - Can spread on non-horse pastures if can't compost
    - Avoid overstocking pastures = increase exposure
  - Use Environmental/Climate conditions to advantage
    - See next slide

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Environmental influence

Climatic conditions, such as temperature, humidity, precipitation, and frequency of freeze-thaw cycles, have profound impact on the development and survival of the various free-living stages of cyathostomes. A common misconception held by horse owners is that a "killing frost" will reduce the number of parasites in the environment. This assumption has proven to be inaccurate as the infective L3 stage can survive freezing temperatures in the lab and the field.

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Environment influence

Table 5. Effects of temperature on the survival, development and persistence of free-living stages (eggs, L1, L2, L3) of strongyles (Nielsen et al., 2007)

Development	Temperature Range	Survival
No development above this level	> 40 °C > 104 °F	Free-living stages die rapidly. Intact fecal balls may retain enough humidity to enable L3 to survive for some weeks.
Optimal temperature range for development of eggs and larvae. Reach infective L3 stage in as little as 4 days.	25 -33 °C 77 - 91 °F	Larvae survive on the shorter term (ie a few weeks), but conditions are too warm for long term survival
Eggs develop into L3 within 2-3 weeks.	10-25 °C 50-77 °F	L3 capable of surviving for several weeks to a few months
Lower limit for egg hatching is about 6 °C. At temperatures in this range, development will take several weeks to a few months.	6-10 °C 43-50 °F	L3 survive for many weeks and months under these circumstances
No hatching and no development	0-6 °C 32-43 °F	Eggs and L3 can survive for several months at temperatures just above the freezing point
No development during frost	< 0 °C < 32 °F	Developing larvae (L1 and L2) are killed, but unembryonated eggs and L3 can survive and persist for long periods (*i.e.* months)
Alternation between freezing and thawing will usually not lead to development unless temperatures exceed 6 °C	< 0 > °C < 32 > °F	Repeated freeze-thaw cycles are detrimental to egg and larval survival

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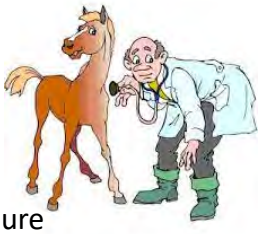
Designing Deworming Program



- Consider Important Factors
  - Use environment to advantage
  - Optimize management to reduce exposure
  - Consult veterinarian for recommendations specific to area
- AAEP recommendations: Get accurate weight for dosage
  - Foals: Deworm every 2-3 months until 3 years of age
    - Use anthelmintic (dewormer) drug to target parasites of concern
    - Treat this age as “high contaminators”
    - See later slide

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Designing Deworming Program

- Adults: AAEP recommends
  - 1 or 2 yearly treatments (spring and fall) to control strongyles, tapeworms, bots, etc.
  - Conduct Fecal Egg Count (FEC)
    - deworm according to findings
    - "15-30% (high contaminators) of adult horses shed 80% of the parasite eggs that contaminate the environment
    - Local veterinarian can do or alternative: https://www.parasightsystem.com/for-horse-owners/ for $30-60

Table 4. Suggested guidelines for classifying horses into different levels of strongyle egg shedding and the expected percentage of the horse population belonging to each group (Kaplan and Nielsen, 2010).

Egg count level		Percentage of adult population[a]
Low contaminators:	0-200 EPG	50-75
Moderate contaminators:	200-500 EPG	5-15
High contaminators:	>500 EPG	10-30

[a] These values are only estimates and the actual percentage of horses in each category will vary among farms depending on a multitude of factors

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Chemical & Brand Names

- Ascarids and pinworms show more resistance to the following drugs; however, they are the better choice for control of:
- Ivermectin+Praziquantel: Equimax, Zimectrin Gold
  - Praziquantel only drug labeled to treat tapeworms
  - Ivermectin: controls bots; doesn't control encysted small strongyles
- Moxidectin+Praziquantel: Quest Plus, ComboCare
  - Moxidectin: controls bots; controls encysted small strongyles
- Small strongyles show much resistance to the following drugs; however, they may be a good choice for control of ascarids and pinworms:
- Fenbendazole: Panacur, Safe-Guard
- Oxibendazole: Anthelcide EQ
- Pyrantel pamoate: Strongid, Exodus

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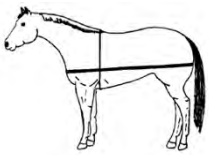
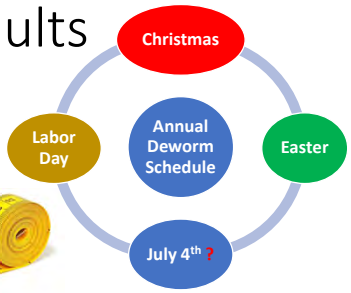
An example plan for adults





- Hot southern climate
- September: Ivermectin
- December: Moxidectin + praziquantel? or Ivermectin
- March/April
  - Oxibendazole or pyrantel pamoate
  - Fenbendazole: 5-d 2x dose; may control encysted small strongyle, more $
  - Summer months: environment unfavorable to parasites
- Northern climate: ?deworm once in summer to control strongyles
- Estimate Body Weight=(Heartgirth x Heartgirth x Body length)/330

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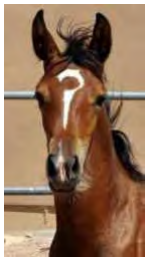
Questions



Primary Reference:
AAEP Internal Parasite Control Guidelines. 2019. Available at: https://aaep.org/document/internal-parasite-control-guidelines

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