**Targeted Parasite Control Programme**

Horses evolved with intestinal parasites. Small numbers of worms do not cause a significant health problem in horses, and actually stimulate the horse’s immune system to encourage resistance to a heavier worm burden. Therefore, small numbers of worms may actually enable the horses to resist heavier and potentially more serious parasite infestation.

The real object of a parasite control program should be to lower (but not eliminate) the adult worm burden, prevent clinical disease in all stock classes, decrease contamination of the horses ‘environment with eggs, and at the same time protect the wormers that we have available by aiming to slow development of resistance. The traditional regular rotational methods of parasite control accomplish none of these goals. We need to concentrate our efforts on treating the correct individuals at the correct time with the correct drug. By doing this we are not only accomplishing these goals but also saving significant amounts of money in the process!

**Understanding your horse**

Individual horses vary greatly in both their resilience (ability to cope with a worm burden) and resistance (ability to maintain low levels of parasites in spite of high levels in environment), however it is possible to make some generalizations about stock classes. Young horses (below 3yrs) are much more susceptible to both high parasite burdens and clinical disease from these burdens. They have lower resilience and resistance to all parasites but the large round worms in particular. We worm these animals primarily to reduce the occurrence of clinical disease, and decrease pasture contamination. When we drench older stock (greater than 3 yrs.) we are primarily trying to reduce the amount of eggs that they are putting out onto the pasture that then in turn re-infect the young stock, although older stock can also be affected clinically if they get large enough worm burdens, and some individual animals may be chronically high shedders. We use faecal egg counts (FEC) to identify where in the range an individual animal is, i.e. are they a high contaminator or low contaminator. Once this is established then we can design an effective parasite control programmed targeted for the individual circumstances.

**Understanding the environment**

While horses and parasites developed together, in the wild horses would graze over huge areas and therefore not be exposed to the large burdens that domestication and our more intensive grazing forces on them. By managing the environment to reduce the numbers of larvae on the pasture we can reduce the burden in our horses and also our reliance on drenches. Removing droppings daily or rotationally cross-grazing with sheep or cattle is effective. Harrowing will just spread the eggs around and make it impossible for the animals to avoid them unless combined with extended periods of paddock resting (greater than 3 months!) so is usually not helpful from a parasite control perspective.

**Understanding the Enemy**

There are several different worm species of significance in horses in NZ. Although there are variations the following outlines the basic lifestyle of the equine parasite.

The eggs or larvae of the parasite are deposited onto the ground in the manure of an infected horse. Your horse then swallows the eggs or larvae while grazing the pasture. These juvenile parasites then mature into egg-laying adults in your horse's gastrointestinal system. In some worm species, the larvae can migrate into other organs, such as the lungs or liver or in the case of cyathstomes can encyst in the intestinal wall, before returning to the intestines as adults to lay eggs. These eggs are then passed from your horse into the pasture where either she or another horse consumes them to start the life cycle over again. The development of the larvae on the pasture is dependent on suitable environmental conditions with temperatures needing to be between 10 and 25 degrees and appropriate rainfall or moisture to prevent drying out and allow larval movement. This means our most significant parasite challenges occur during the autumn and spring/early summer with much lower numbers seen in winter.

**Tapeworms:** *(Anoplocephala perfoliata)* that can cause spasmodic and ileal impaction colic.

**Pinworms** (*Oxyuris equi*) Female pinworms lay their eggs in the skin around the horse's anus where they are often rubbed off onto the ground. They are then eaten by a horse and the life cycle repeats. The egg masses are extremely itchy. Horses with pinworm infections will sometimes rub their tails until all the hair is pulled off. Adult pinworms (about 1-3/4 inches long) may be seen around the anal area, along with a clear discharge (the egg masses).

**Large Strongyles** (Strongylus vulgaris)
The larvae mature in the intestinal tract but in rare cases can migrate and then lodge in the blood vessels of the intestines causing severe colic and even death.

**Large roundworm:** *(Parascaris equorum)* Most damage occurs as roundworms migrate through the body. They cause coughing, pneumonia, liver damage, diarrhoea, and colic. Large numbers of adult roundworms can cause intestinal blockage or rupture. Other signs include ill thrift, pot belly, rough hair coat, and slow growth. These worms are of particular significance in young horses.

**Bots:** nasal and intestinal species. These are probably not of major clinical significance in New Zealand but need to be treated based on the annoyance factor.

**Cyathostomes:** these are the ‘small redworm’ whose larvae can become inhibited in the gut wall and that can cause ill-thrift, weight loss, serious illness, colic and even death when they emerge. Currently cyathostomes are of major significance in both young and mature horses.

**Threadworms** (Strongyloides westerii)
Mostly a concern in foals. Larvae are ingested in the mare's milk or larvae present in the bedding can penetrate the foal's skin. The larvae migrate through the lungs and small intestine. The main concern from threadworms is diarrhoea in very young animals because of early infection and short lifecycle (2 weeks).

**Understanding our drenches**

There are three main types (or families) of drenches, Benzimidazoles (white drench, Panacur), Pryrantel (clear drench, morental) and the Macrocyclic lactones (Ivermectin, Abamectin, Moxidectin). In addition, Praziquantel is included in many drenches to eliminate tapeworms.

In our area we have seen high levels of resistance to benzimidazoles in particular fenbendazole with cyathostomes. For this reason, if this drench is to be used a faecal egg count reduction test should be performed 10-14 days post drenching to ensure efficacy. ML’s are effective routine drenches in situations where there is no resistance (if you are not sure then check!) however there are high levels of resistance of *Parascaris equorum* to ivermectin so when drenching young stock I recommend avoiding this. Moxidectin has a good level of effectiveness against encysted cyathostomes which most other drenches don’t have however it should be avoided as a routine drench and kept in reserve for high shedders or particular times of year.

**The Plan**

*Early spring*

FEC all horses. This is a good time to do this as hopefully horses will not have had a drench for at least 6 weeks over the winter period. This is important to establish a base line for each individual and an overall picture of the herd health relating to parasites. Drench individual animals as required based on these results (see chart below). Any animals which are drenched should have a further FEC performed 10 to 14 days later to ensure there is no drench resistance. This should only need to be done once a year. Once you have established an appropriate drench that works on your property then stick with it as your base drench. Any animals falling in the mid-range should be checked again in 6-8weeks while those with very low numbers should be monitored in 3 months’ time.

*Summer*

3 months later a further FEC should be performed but this time only horses in high range will need to be drenched as parasites development on pasture should be lower through the summer.

*Autumn*

This FEC mainly to establish what the cyathostome burden of your horse is prior to the winter when the larvae will encyst in the gut wall. The threshold for drenching is lower at this time to avoid large numbers of encysted larvae when we drench in early winter.

*Early winter*

All animals should be drenched; low shedders with base drench and high shedders with moxidectin. Praziquantel should be included in this drench.

The following flow diagram outlines this pathway for adult (>3years) horses in the first year. After this a more individualised approach can be adopted based on what these results have been. Any horses which have followed a red pathway during the year or are grazing with young stock should work off this flow diagram again the next year. Those that consistently stay in the green should still perform the FEC in spring and autumn and have the drench in winter but can skip the steps in between. If your horse follows the amber pathway then what to do the following year should be based on spring FEC result.

FEC >.0

Early Spring (Sept/Oct)

FEC all horses

Drench using selected base drench and repeat FEC in 10 -14 days to check drench cacy

FEC >/= 300

FEC >/= 300

FEC 150 - 300

FEC 6 – 8 weeks later

FEC >/=300

FEC 0

FEC </= 150

FEC <300

Summer (Dec)

Repeat FEC

Drench

Drench

FEC < 300

Early autumn (Mar)

Repeat FEC

FEC >/= 200

FEC < 200

Drench

Early Winter (June)

All animals

High shedders (Red) Drench using moxidectin/praziquantel combination

Low/med shedders (Green/amber) Drench using base drench

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