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Chapter 8. Behaviour change

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Overview

Understanding human behaviours around prescribing, management, uptake of monitoring tools and anthelmintic use is important when trying to effect behaviour change towards sustainable strategies for parasite control. While education is important in promoting responsible use, to effect behaviour change, the practical barriers for equid owners to engage with responsible anthelmintic use must also be considered. To inform CANTER's future messaging and encourage the equine community to engage in sustainable strategies for parasite control a behavioural analysis was performed.

The process included a review of relevant literature (see Reference List), followed by two behavioural analyses techniques which were conducted collaboratively by the authors. The COM-B model of behaviour change was conducted to outline factors impacting equid owner behaviour in relation to parasite control, including considerations regarding prescribers' attitudes and motivations (Table 1). Subsequently, behavioural mapping was used to outline equid owner decision-making about anthelmintic product use (Figure 1), as well as prescriber knowledge and awareness of parasite control (Figure 2). The process and results of the behavioural analysis are outlined below.

The behavioural mapping identified three 'touchpoints' where prescriber intervention is potentially salient – ordering a monitoring test, interpretation of results and purchase of anthelmintics. These 'touchpoints' for potential intervention provide opportunities for prescribers to discuss the barriers equid owners are facing with appropriate parasite control and associated management practices, and to discuss the options available to them. Therefore, it is essential that prescribers are equipped with the knowledge to support owners in applying sustainable strategies to parasite control. The CANTER Guidelines aim to equip prescribers with evidence-based principles to support the prescribing-decision making process and associated interactions with equid owners.

The process

The process for the behavioural analysis included a review of relevant literature (see Reference List), followed by two behavioural analyses techniques which were conducted collaboratively by the authors. Initial analysis with the COM-B model of behaviour change (B) outlined the aspects related to equid owners' capability (C), opportunity (O), or motivation (M) in relation to four aspects: environmental management, use of monitoring tools, anthelmintic product use, and awareness of resistance. Veterinarians' and SQPs' attitudes and motivations were also considered. Subsequently, behavioural mapping was used to depict the process of different behaviours and thought processes relevant for endoparasite management to take place, the factors which might impact those processes, and the 'touchpoints' where intervention is potentially salient. In both instances, results were based on the literature as well as the authors' own experience. However, it should be noted that literature is relatively limited in general around the behavioural drivers for endoparasite management, and more research is warranted.

Results

COM-B analysis (Table 1) identified that:

- Advertising of anthelmintics to equine keepers is prohibited in the UK. Whilst use of targeted parasite control programmes is acknowledged and endorsed, the growth in internet retailing[1] and consequent availability of anthelmintics can make, from an owner perspective, treating an equid a more straightforward step than integrating regular monitoring.
- Inconsistent, unclear messaging from different groups (including prescribers) is likely contributing to the complexity of behaviour change about parasite control; this effect may be particularly strong for specific factions such as donkey owners.

[1]The amendments to the Veterinary Medicines Regulations 2013 require internet retailers and online suppliers of POM-V, POM-VPS and NFA-VPS medicines to register with the Veterinary Medicines Directorate. If a veterinary medicine is supplied against a prescription that is not in writing, then the person who prescribes the product must make a record of the reason for prescribing it. This includes online prescriptions.

- Anthelmintic resistance (AR) is an 'invisible', intangible threat, which is hard for people to comprehend and hence not a strong behavioural driver. Lessons about long-term threats and behaviour change could be borrowed from literature around antimicrobial resistance (AMR), though with the caveat that AMR represents a threat to human life as well and hence risk may be construed differently.
- Some monitoring tests are expensive and/or hard to perform (for example, FEC on a herd or tapeworm ELISAs) compared to simply purchasing an anthelmintic, so need to be made as salient and easy to purchase and use as possible.
- Use of monitoring tools requires more knowledge and understanding than simply purchasing an anthelmintic and will therefore appeal to some but not others. Encouraging the use of monitoring does not necessarily mean people then reduce their anthelmintic use.
- Owners are motivated to avoid 'unnecessary chemicals' – likely to have wide appeal and could be a useful lever, particularly in relation to the growing awareness of the need to be sustainable in equid keeping.
- It is important to consider the individual context for the owner/animal; for example, donkey owners may have entirely different experiences, social groups, and advice-seeking behaviours to horse owners / yard managers.

Behavioural mapping (Figure 1 and Figure 2) outlines that:

- Organisations could consider how to create initial prompts around whether an equid needs anthelmintic treatment, in order to start off the behavioural chain involving use of a monitoring tool.
- There are key points at which an owner interested in parasite control must interact with the outside world (e.g. when purchasing a test or anthelmintic product). Capitalising on these points of contact for potential intervention could be key, as they provide opportunities to share messaging and information.
- The additional steps needed for use of monitoring tools contributes to owners choosing to avoid their use if they feel it is unnecessary. A review of the messaging around why monitoring tools should be used could provide insight

into how to communicate most effectively with owners, particularly in relation to specific factions (e.g. donkey owners, livery yard managers).

- There are a significant proportion of cognitive tasks and decision-making processes throughout the monitoring/anthelmintic product pathway. It may be pertinent for groups to decide whether owners should be encouraged to relinquish these steps to an expert every time (e.g. should owners be encouraged to only purchase an anthelmintic after speaking to a prescriber). Whether this approach is taken or not, clear and consistent messaging should inform owners of the potential choices available to them.
- The physical tasks, such as collection of faecal samples for a FEC test, weight assessment of the horse, or administration of an anthelmintic, are all known to be potentially problematic. Again, clear and salient messaging could be created, tested, and distributed extensively to help to overcome commonly known issues.
- Veterinary surgeons, veterinary nurses, veterinary pharmacists and SQPs need to regularly update their knowledge around anthelmintic use, resistance, any local issues (e.g. local liver fluke), and owner communication methods. However, parasites are often considered uninteresting topics and may not be popular CPD subjects; again, positive messaging and CPD options could help to address this and maintain interest over time.

Considerations to effect behaviour change

Barriers to behaviour change related to environmental management, use of monitoring tools, anthelmintic use and awareness of AR were identified and associated considerations for interventions to effect behaviour change have been summarised below.

Environmental management

Current barriers:

- Knowledge that environmental management, such as good regular pasture management, can help to reduce reliance on anthelmintic use may be variable amongst equid owners.
- Good regular pasture management can be difficult for some equid owners (e.g. physical difficulties, livery yard restrictions).
- Isolation of new arrivals is unpopular.

Considerations to effect behaviour change:
Clear and salient messaging on environmental management practices to reduce reliance on anthelmintic use could be disseminated to facilitate prescriber discussions with equid owners on issues with management strategies.

Use of monitoring tools

Current barriers:

- Knowledge on how and when to perform monitoring tests and how to interpret results is likely to be variable.
- The practicalities of obtaining a faecal sample can be difficult on some equine premises.
- Performing a test is often considered an additional, and potentially unnecessary, expense if the equid then requires treatment anyway.

Considerations to effect behaviour change:

Reducing the 'use of chemicals' and minimising environmental exposure to anthelmintics is a behavioural driver and could be leveraged in prescriber discussions with equid owners to encourage the use of monitoring tools and reduce anthelmintic use. Further, equid owners enjoy monitoring their horse's health and are likely to continue with regular monitoring tests once engaged.

Use of anthelmintics

Current barriers:

- Familiarity with traditional interval dosing regimens has encouraged equid owners to believe that treatment based on the season/time of year is appropriate.
- Inconsistent information around parasite control has led to confusion for equid owners on what approach to take.
- Administering an anthelmintic can be difficult and may lead to under- or over-dosing.
- The physical behaviour of administering an anthelmintic is relatively easy with one small action compared to using monitoring tools.

Considerations to effect behaviour change:

Clear and consistent messaging should inform equid owners on the parasite control options available to them and to discuss these options with their prescriber before purchasing an anthelmintic. Prescribers should aim to discuss barriers to sustainable parasite control with equid owners, such as estimating equid weight and administering anthelmintics correctly.

Awareness of anthelmintic resistance

Current barriers:

- The threat of AR is not a strong behavioural driver amongst equid owners – owners may be familiar with the concept of AR but unsure of what impact this has on them and their equid.

- Prescriber knowledge on best practice to minimise the development and spread of AR is variable.

Considerations to effect behaviour change:

The translation of AMR initiatives to normalise discourse about future risk of AR in the equine industry could be explored. Further, industry-wide agreement on guidelines for sustainable parasite control in equines will facilitate consistent messaging on parasite control strategies to reduce the development and spread of AR.

CANTER aims to lead a coordinated approach to sustainable parasite control in equines and act as a central resource for the equine community. CANTER has developed these guidelines to provide prescribers with information on the key principles to consider that inform the prescribing decision-making process to support a consistent approach across prescribers. CANTER will deliver proactive and appropriate communications based on the recommendations in these guidelines to the equine community to support discussions between prescribers and equid owners and promote industry-wide action on parasite control in equines.

Friction and Fuel

Behavioural interventions aim to make the desired behaviours easier to perform (add fuel) or undesirable behaviours more difficult to perform (add friction). With parasite management, the desirable behaviour is vastly more complex than the undesired ones; some change has nevertheless been achieved due to messages around minimising chemical usage and optimised horse health. Additional 'fuel' could be added by increasing the visibility and accessibility of parasite-testing tools; for example, having them placed in the reception of veterinary practices or other anthelmintics' point of sale counter areas with marketing materials, having cut-cost sign up for limited time, and by encouraging livery yards to work together to create social norms around parasite management.

These 'fuel' actions should conform to the '**EAST'** framework:

- **E**asy – making it as easy as possible for people to perform and reducing as many intermediate steps as possible
- **A**ttractive – visually attractive and fun, if possible
- **S**ocial – social norm or socially engaging activities
- **T**imely – using existing touchpoints such as veterinary surgery waiting room and feed shop visits.

Adding 'friction' could involve additional steps from the prescriber pre-purchase for anthelmintics. For example, this could involve hiding deworming products from view in shops; increasing the cost of those products, or making them prescription-only from a vet. Each option, of course, has potential trade-offs and we do not recommend these suggestions per se, but it is important to consider the full range of potential changes available.

Future research direction

Research into behavioural drivers and message salience is relatively limited, especially for specific groups within the equine sector and 'harder to reach' communities. Research is vital to determine why owners change their behaviour in relation to environmental or social stimulus, and the types of messaging and language which are most likely to engage and bring about change.

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Appendices

Chapter 8. Tables and Figures

Table 1. COM-B analysis of factors impacting behaviour in relation to endoparasite management

		Behaviours			
		Environmental management	Use of monitoring tools	Use of anthelmintic products	Awareness around anthelmintic resistance (AR)
Capability	Psychological	Knowledge – owners may not be aware of the links between pasture management and parasites. Potential disbelief that pasture control methods may be efficacious.	Knowledge probably low on some aspects; e.g. when to take sample, what cut-offs mean, when to do a reduction test. Free advice from companies offering tests replaces need for owners to understand parasite lifecycles (for some this may motivate them to use monitoring tests; others may dislike this). Donkeys frequently not perceived as needing the same level of preventative care as horses –this extends to anthelmintic use. Many veterinary surgeons are unaware of lack of validation in use of ELISAs for donkeys.	Parasite life cycles are very complex. However, previous sales messaging has over-simplified them for salient messaging – so owners think they know what to do (no need to learn more or seek advice). Information overload or conversely lack of information from rushed SQPs/veterinary surgeons creates confusion for owners with what approach to take. SQPs/veterinary surgeon advice can be inconsistent. Donkeys frequently not perceived as needing the same level of preventative care as horses –this extends to anthelmintic use.	Understanding of AR and the risk this poses to individual horses and equids globally is variable. Owners may be aware of AR in other grazing species but not know of the situation in equids. Owners may be familiar with the concept of AR but unsure what impact this has on them and their horse. Owners may be disinterested in the issue of AR. Veterinary (and other SQP advice) advice on best practice to reduce AR is inconsistent, creating confusion. *Need industry-wide agreed guidelines for sustainable parasite control.* Explanations of the use of FECs in an individual equine versus wider yard management may be lacking and confusing for owners.

	Physical	Poo-picking can be a physically heavy task, but quite manageable/easy for most. Where horses are kept on a livery yard, individual owners may be constrained by the opinions of the livery yard owner +/- other owners using the yard to manage pastures/stocking density appropriately.	Obtaining faecal samples can be difficult if horses are in herds. Unknowns: how easy do owners think performing a tapeworm ELISA test is?	Administering anthelmintics is notoriously tricky – owners may avoid (e.g. putting paste in horse's feed) or over-dose due to concerns about spitting out. Important for owners to have accurate weight estimation of equid if deciding to use an anthelmintic to prevent over or underdosing – are owners estimating weight or simply giving a whole tube? If they are estimating weight – how?	N/A
Opportunity	Social	Poo-picking is a social norm. Isolation of new horses is unpopular.	Monitoring little talked about/low social pressure.	Using an anthelmintic is a social norm; 'responsible horse owner' behaviour – part of horse ownership (though peer pressure likely low due to being a low frequency event). Veterinary surgeons and SQPs will advise on anthelmintic purchase without insisting/advising on FEC first; makes it more of a social norm.	Not really spoken about – though is reported in media. Donkeys often overlooked in marketing/media around anthelmintic use and parasite control.

	Physical	Poo-picking can be tricky (big fields, winter conditions, dark) and hence not manageable.	Cost of tests (especially tapeworm ELISAs). However, advice is free and hence cost does not impact behaviour. FECs can be difficult to perform on herds of horses (e.g. studs).	Purchasing anthelmintics is very easy – e.g. online purchase- hence owners may feel this is an easier option than taking the behavioural steps of performing monitoring tests. While anthelmintics themselves are expensive, many may think monitoring tests are simply an additional expense if they then need to use an anthelmintic anyway.	Few locations/horses known to have resistant parasites – as these become more common, itis likely we'll see more awareness and concern.
Motivation	Automatic	Poo-picking can be a daily habit for some. The look of a clean field is preferred: 'good horse care'.	Little opportunity for habit formation – perhaps seasonal use of monitoring tests? Reminders help with this, however. We know that owners enjoy monitoring things with their horses (e.g. once engaged in FECs will enjoy carrying on with them), and that motivation for testing is related to reducing chemical usage through anthelmintic products. For owners who enjoy and feel good about using a monitoring test instead of using an anthelmintic, strong motivational driver from 'feel good' factor.	Messaging to owners advocating the routine use of anthelmintics from a variety of outlets has made it easy for people to think in terms of seasons for anthelmintics; salient/habit type messaging around well-accepted. 'Traditional' anthelmintic use practices, for example, treat for tapeworm in the Autumn. The behaviour of using an anthelmintic is relatively easy – one small action and the horse is 'purged' – good owner action, hence people may enjoy that part of it compared to testing. Familiarity with traditional use of anthelmintics can impose reluctance to try different strategies; "I've never had a problem before and I've been doing	AR is a future concern; small individual actions do not seem to add up – "someone else's problem". AMR research has normalised talking about future risk; can we leverage this for AR? Fear is relatively low – problem invisible.

				this for years, why should I worry now". If an owner feels their horse is losing weight, administering an anthelmintic may be seen as a quick fix, which doesn't need to have a vet visit.	
	Reflective	Unknown	Owners who already use monitoring tests are more motivated to continue doing so – can we make it easy for people to start this behaviour, so they carry on? Testing requires greater level of understanding and knowledge than simply using a product.	Information available from some outlets suggests owners don't need to understand – can just follow simple instructions and will be protected from parasite.	We know that motivation to avoid AR is not high – with AR and biosecurity owners shown to think individualistically rather than about the collective good.

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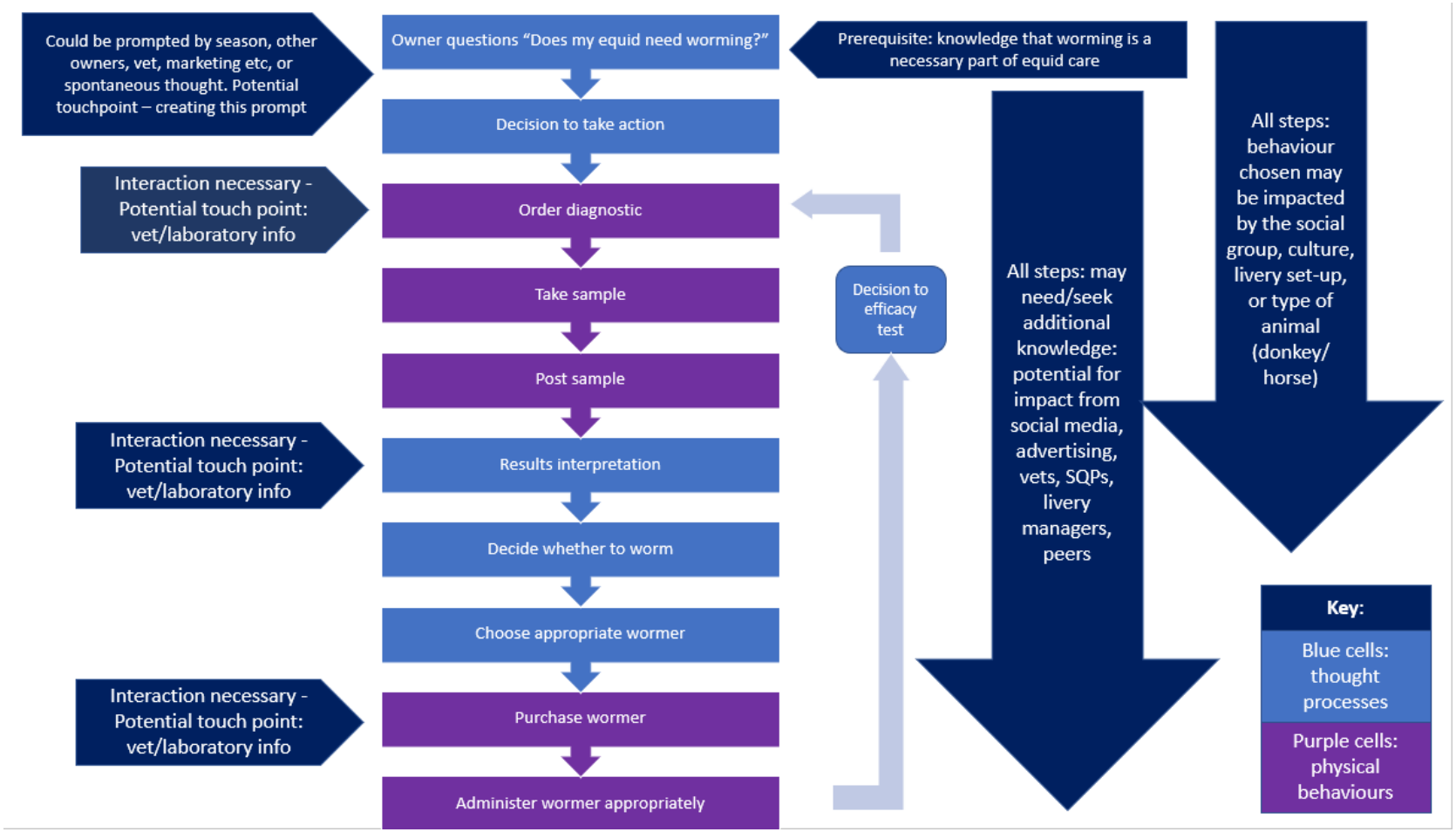

Figure 1. Behavioural map of horse owner decision making about anthelmintic product use

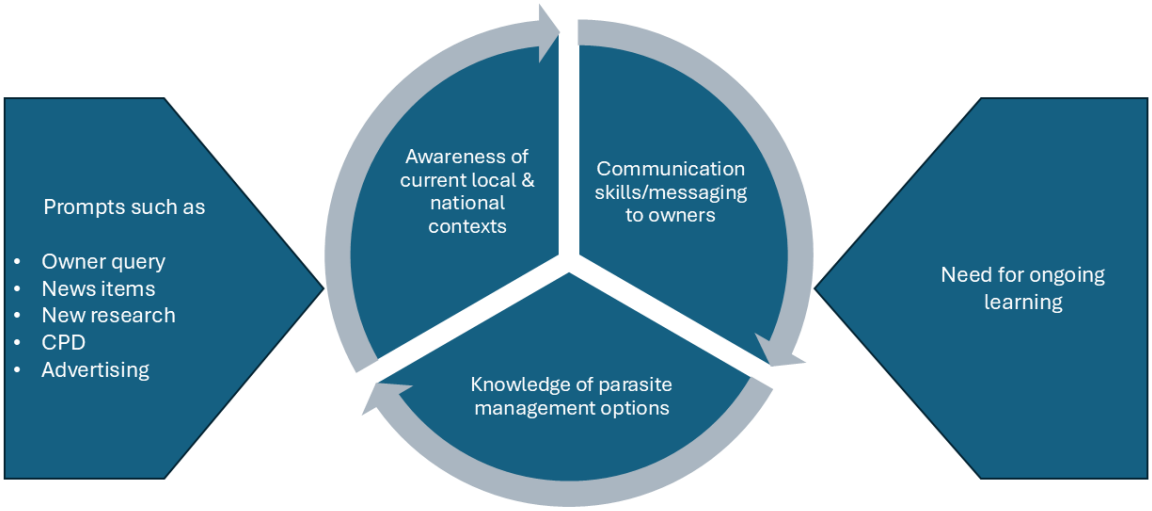

Figure 2. Behavioural map of veterinary/SQP knowledge and awareness of endoparasite management