Technical Sheet for Solution Implementation

Smart Deworming: Diagnostics-Driven Interventions

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Thematic Area: Health and Welfare of Equines.

Priority: What practices can be implemented in order to promote biosecurity measures and prevent emergent diseases?

Need: Parasitism and reasoned deworming: How to implement reasoned deworming? What are the tools to use?

Solution EU Number: HE-05.

Content of the Solution: Strategies for selective deworming in horses and its advantages and disadvantages

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Reasons for Implementing this Solution

Delective deworming is a modern approach to parasite control that aims to optimize the health and well-being of horses, to reduce unnecessary drug use, and lower the risk of resistance. Unlike traditional methods, it relies on regular diagnostic testing to identify the level of excretion in horses and, potentially, their parasite load. Treatment is only administered when necessary.

Description of Solution Strategies

Selective deworming is a modern, evidence-based approach to parasite control in horses. Unlike routine deworming at fixed intervals, it relies on targeted diagnostic testing and allows for treatment decisions to be made on an individual or herd level.

The core of this method involves regular fecal, blood, and/or saliva examinations—particularly quantitative fecal egg counts (FEC), fecal cultures or PCR tests to identify parasite species, and ELISA-based detection of Anoplocephala (tapeworm) infestations. Deworming drugs are only administered when parasite shedding or a significant parasite load is confirmed, which greatly reduces the amount of anthelmintics used.

Through regular monitoring—typically in spring and autumn—and efficacy checks 14 days after treatment; the success of deworming measures can be ensured. The goal is sustainable parasite control that protects both equine health and minimizes the risk of resistance development.

Diagnostic Methods

A) Fecal Egg Count (FEC) – e.g. McMaster Method

- Purpose: Quantifies strongyle egg excretion (eggs per gram – EPG).
- Procedure: A fecal sample is prepared, and eggs per gram are calculated (multiplication factor: 25 or 50).
- Benefit: Identifies high shedders, over 200 to 500 EPG, for targeted treatment.

Other methods may be useful for detecting different parasites: For example, Coles' method is used for roundworms and Proudman's method is used for whipworms.

B) Fecal Culture or PCR Testing

- Purpose: Detects larvae of large strongyles (e.g., Strongylus vulgaris), whose eggs cannot be distinguished from those of small strongyles during coproscopy.
- Why important: S. vulgaris can cause life-threatening colic; testing helps assess group-level risk.

C) Anoplocephalus (tapeworm) Diagnostics – ELISA Tests

- Type: Blood-based or saliva-based ELISA to detect antibodies against tapeworms.
- Use case: Supports selective autumn treatment, especially as resistance is emerging in some regions (e.g. France).

Implementation of Selective Deworming

1. Classify horses according to their risk level regarding strongyles during the grazing season
   - Low egg shedders (< 200–500 EPG): no treatment, continue monitoring.
   - High egg shedders (≥ 200–500 EPG): targeted deworming with a suitable anthelmintic.

2. Use Complementary Tests
   - PCR or culture for S. vulgaris, especially in case of new groupings or uncertain infection history. If there are no large strongyles in the herd, some weak excreters over seven years old may not need to be dewormed for strongyles at all.
   - ELISA test (or coproscopy) for anoplocephalus (tapeworms) in the fall to perform selective deworming for this parasite.

3. Efficacy Check
   - Fecal egg count repeated 14 days after treatment to verify effectiveness and detect possible resistance.

Legal Framework, Recommendations and Subsidies

- In countries like Denmark and Sweden, routine deworming without diagnosis is not permitted.
- Similar policies are in place in the Netherlands, Finland, and Italy.
- Veterinary labs and services offer guidance, diagnostic support, and tailored monitoring plans.
- Specific subsidies for deworming protocols are rare, but cross-species grazing projects and national veterinary programs can cover such measures, e.g. in the context of sustainable parasite management and pasture health (e.g. Rural Development Program under the CAP, EAFRD funds)

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Implementation Steps

1. Check if financial or advisory support is available: Check if national or EU programs support sustainable parasite control, pasture management, or veterinary advice. Direct subsidies are rare, but some rural development programs may be relevant.

2. Develop a customized deworming strategy: Work with your veterinarian or a specialized laboratory to create a customized, risk-based protocol for your horses. The plan should include diagnostic intervals, treatment thresholds, and seasonal adjustments.

3. Carry out routine diagnostic surveillance: Begin by performing fecal egg counts (FEC) on a representative group of adult horses. Based on the results, identify the horses with high shedding for treatment and those with low shedding for monitoring only.

4. Gradually expand and adapt in future seasons, reduce the number of tests for horses with consistently low shedding and include other groups of horses (e.g. foals, broodmares). Add supplementary tests (e.g. PCR, ELISA) as necessary to assess parasite risk more accurately.

5. Regular evaluation of treatment efficacy: Carry out anthelmintic efficacy checks (FECRT) to detect resistance at an early stage.

6. Monitor for large strongyles if the herd composition or history changes.

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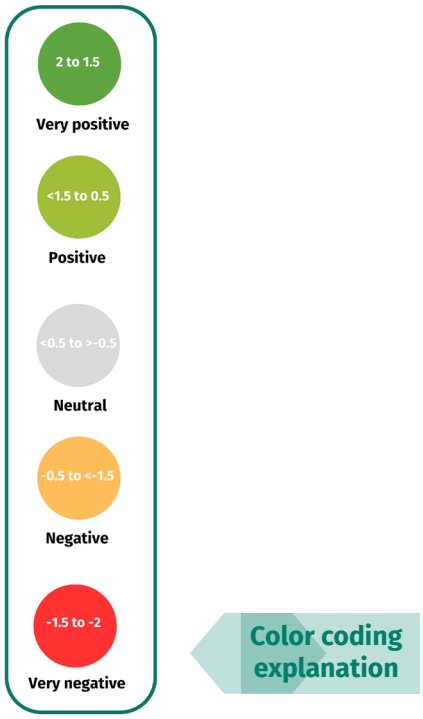
How Will this Solution Impact the Performance of your Farm ?

TOPIC	SCORE
Social	0.67
Economics	0.67
Welfare	0.92
Health	1.75
Environmental	1.17
Land access and management	1.17
Global	1.06



Socioeconomics: This solution will support the social performance of the farm because it encourages preventive and responsible health management, improves long-term animal welfare, aligns with veterinary standards, and strengthens the farm's public image. This solution will support the economic performance of the farm because it reduces reliance on costly treatments and promotes more sustainable parasite control, particularly benefiting farms shifting away from less targeted deworming routines.

Health & Welfare: This solution will support the health performance of the farm because it leads to more healthy animals: reduces overmedication, unnecessary chemical exposure and preserves gut microbiota. Horses benefit from a reduction in parasite load and associated health risks (colic, weight loss, immune suppression). However, some issues related to underestimation of total parasitic load and on-time treatment delays must be taken into account. This solution will also support the welfare performance of the farm as related to good health and emotional state.

Environmental Sustainability: This solution will support the environmental performance of the farm because reduced use of anthelmintics protects beneficial insects and mitigates ecological harm. The solution reduces the use of dewormers and their impact on biodiversity. These effects are especially relevant in systems with regular pasture use. While indirect in some cases, the long-term environmental benefits are clear and measurable.

- On the environment, through the reduced use of macrocyclic lactones (ivermectin and moxidectin), which have a negative impact on grassland biodiversity: coprophagous fauna (reproduction and survival of dung beetles) and aquatic species. The ecosystem services provided by dung beetles are numerous:
- They fertilize the grassland by releasing the nutrients present in the dung in a form that is available to plants and by facilitating their incorporation into the soil that limits the use of chemical fertilization, which is a factor in global warming.
- They reduce the production of NH4 (a greenhouse gas) by manure with optimal testing the use of medicines can be reduced with less of biodiversity loss and medical residues in watersheds.
- They degrade the manure and therefore limit the areas of refusal.
- They dig galleries in the soil, limiting soil compaction and leaching in the event of rainfall.
- They degrade the dung, which helps it to dry out and reduces the survival of strongyles larvae.
- Anthelmintics are very harmful to soil and water organisms, so using less of these will have positive effects on biodiversity and water management and reduce water pollution.

Land access and management: This solution will support the land access or management performance of your farm because .it supports nutrient recycling in pastures. This solution limits pasture contamination to prevent horses from being reinfected quickly, by the numbers and survival of eggs and larvae of endoparasites in the soil. Using this solution can also provide access to high environmental value grasslands

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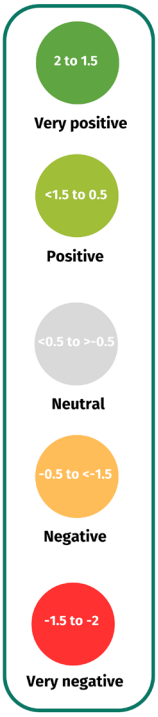
How Will this Solution Impact the Resilience of your Farm?

TOPIC	SCORE
Social	0.24
Economics	0.24
Welfare	0.42
Health	0.78
Environmental	0.47
Land access and management	0.36
Global	0.43



Socioeconomics: This solution will not impact social performance of the farm facing external challenges assessed because although it aligns with welfare standards and promotes sustainable practices, its benefits are limited by the added workload, time commitment, and need for staff training—challenges that can be exacerbated during pandemics or labor shortages. This solution will not impact economic performance of the farm facing external challenges assessed because the long-term savings from reduced drug use and improved animal health are offset by the additional diagnostic and implementation costs, making the overall financial impact modest and highly dependent on context.

Health & Welfare: This solution will significantly enhance the health performance of the farm when facing external challenges. It reduces pain, mortality, and the need for curative medication. By limiting chronic damage caused by parasites and minimizing treatment side effects, horses are likely to stay healthier for longer. With healthier animals, the farm can better allocate its resources and attention to addressing other external challenges more effectively. The solution will also have some slightly positive impact on welfare performance, particularly by promoting positive emotional states in horses. This is achieved through the maintenance of good health and the prevention of discomfort associated with a high parasitic load. These benefits are especially valuable when the farm is required to meet compulsory high welfare standards.

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Environmental Sustainability: This solution will not impact environmental performance of the farm facing external challenges assessed because it does not have many direct effects on environmental sustainability in regards these challenges. However, the solution provides some support for environmental resilience, by helping the farm meet sustainability goals without extra costs during inflation, it will reduce the impact of deworming. This solution will not impact land access or management performance of the farm facing external challenges assessed because there is no direct effect on land availability or management. However, it will support soil and biodiversity health, helping farms sustain productivity with fewer external inputs and helps with effective adaptation and sustainable land management under constrained conditions.

How Can this Solution Help your Farm Cope with Specific External Challenges to Become More Resilient?

CHALLENGES	SCORE
Inflation	0.40
Pandemic	0.36
High welfare standards	0.53
High infectious diseases	0.46
Extreme weather event	0.35
Loss or limited access to grassland	0.42

2 to 1.5 Very positive
<1.5 to 0.5 Positive
<0.5 to >-0.5 Neutral
-0.5 to <-1.5 Negative
-1.5 to -2 Very negative

Inflation & Social Crises: This solution will not impact the global performance of the farm facing inflation because although it supports preventive care, improves animal health, and contributes to environmental sustainability by reducing medication use, its benefits are mostly long-term and indirect; meanwhile, increased diagnostic frequency and labor needs may slightly reduce profitability, especially where staffing is already limited. This solution will not impact the global performance of the farm facing pandemics because while it helps maintain horse health and operational standards with reduced reliance on medical supply chains, its time-consuming nature and need for labor make it difficult to scale under staffing constraints, limiting its immediate contribution to short-term resilience despite its overall preventive value.

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Welfare & Diseases: This solution will have a modest impact on the global performance of the farm in the face of infectious disease outbreaks. However, it supports strong animal health, while also contributing to environmental sustainability by reducing the need for medication. In contrast, the solution makes a significant contribution to the farm's global performance when adapting to high welfare standards. By improving animal health, it ensures a positive emotional state free from pain and discomfort. Additionally, the reduction in medication use further supports environmental sustainability.

Climate Change & Access to Land: This solution will not impact the global performance of the farm facing extreme weather events (abnormally high or low temperatures, draught, excessive rain, windstorms and/or flood), because most of the effects are undirect. However, rational deworming has positive outcome regarding biodiversity, since insects such as beetles wouldn´t suffer so much. It protects horse health when feeding quality drops and animals are already under physiological stress. It supports soil and biodiversity health, helping farms sustain productivity with fewer external inputs—a crucial asset in climate-affected systems.

Land access/management challenge: this solution will not impact the global performance of the farm facing loss or limited access to agricultural land because most of the effects are undirect. However, maintaining horse health in more confined systems with potentially higher parasite transmission risk and medication costs is critical when farms need to invest in alternative feed sources or land rentals. It also supports reputation and trust, which is especially valuable for farms offering public services like EAT or nature-based tourism, who must justify their continued use of reduced natural spaces. It supports effective adaptation and sustainable land management under constrained conditions. This solution may give access to meadows with high environmental value, so the farm will be less impacted.

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Cost-Benefit Analysis

Costs

Socioeconomics:

- **Diagnostic Costs:**
  - Fecal egg count (FEC), PCR, and ELISA tests may be more expensive than standard deworming products, especially in the initial phase.
  - Costs are higher during implementation but decrease as routines and infrastructure are established.
  - In-house testing (microscope + training) could reduce long-term costs, but initial investment depends on farm size. (Please note that, in some countries, this procedure is classified as veterinary medicine and may only be performed by qualified veterinarians.)
- **Veterinary and Labour Costs:**
  - Increased time investment for sample collection, labeling, record-keeping, and interpreting results.
  - Additional veterinary consultations are needed to set up and adapt the deworming protocol.
  - Training time for staff and owners unfamiliar with diagnostic-based parasite management.
- **Pharmaceutical Industry Impact:**
  - Potential reduction in routine anthelmintic sales → loss of revenue for manufacturers and distributors.
  - Short-term Health Risk Cost (indirect):
  - If tests are misinterpreted or parasite stages not detected (e.g. immature larvae), horses may be undertreated, possibly resulting in hidden health costs (e.g., weight loss, colic, performance decline).

Benefits

- Coproculture is carried out on a group basis, making it a more cost-effective alternative to purchasing deworming medication.
- **Long-term Cost Reduction:**
  - Once individual shedding patterns are known, treatment frequency declines, reducing medication costs significantly.
  - More efficient resource use: dewormers, labor, and veterinary time are deployed only when necessary.
- **Enhanced Farm Image & Marketability:**
  - Evidence-based, responsible parasite control improves the public image of equine facilities, aligning them with consumer and welfare expectations.
  - Facilities may benefit from increased client trust and demand.
- **Prevention of Larger Economic Losses:**
  - By identifying high shedders early and minimizing parasite-related disease, production loss, performance decline, and treatment costs are avoided.

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Costs

Health & Welfare:

- **Diagnostic Limitations:**
  - Risk of under-treatment if FECs are misinterpreted or not conducted at the right time.
  - Risk of missing large strongyles if the farmer only performs coproscopy as a diagnostic test on his herd.
- **Stress from Handling:**
  - Temporary discomfort from repeated handling or testing procedures (e.g., blood draw for ELISA).

Environmental Sustainability:

- **Logistics & Waste Management:**
  - Minor additional resource use for safe handling and disposal of biological samples (blood/feces).
  - Transport to labs in rural areas may slightly increase fuel use.
- **Infrastructure Needs:**
  - Farms without electricity/water access in diagnostic areas may need basic upgrades (e.g. sample storage).

Benefits

- **Improved Individual Care**
  - Selective deworming enables targeted, evidence-based interventions, improving individual horse welfare.
  - Reduces overmedication, avoiding unnecessary chemical exposure, and preserving gut microbiota.
- **Resistance Management:**
  - Lower anthelmintic usage slows the development of resistance, safeguarding long-term treatment efficacy.
  - Diagnostic-based protocols detect early signs of reduced drug effectiveness (via FECRT), enabling timely adjustments.
- **Global Health Gains:**
  - Horses benefit from a reduction in parasite load and associated health risks (colic, weight loss).
  - Studies suggest that low-level parasite exposure may even support immune competence in certain age groups.
  - By reducing chronic parasite damage and treatment side effects, horses may remain healthier longer.

- **Reduced Chemical Impact on Ecosystems:**
  - Lower use of macrocyclic lactones (e.g. ivermectin, moxidectin) protects dung beetles, aquatic species, and soil organisms.
  - Dung beetles provide essential ecosystem services: nutrient cycling, pasture fertilization, manure breakdown, and greenhouse gas mitigation.

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Costs

Benefits

- **Healthier Pastures & Soil:**
  - Less drug residue → better soil life, less compaction, more efficient dung degradation, and reduced larval survival in pastures.
  - May increase eligibility for eco-schemes or high nature value (HNV) farming subsidies in some EU contexts.
- **Climate & Water Benefits:**
  - Lower environmental pollution and improved water quality.

Cooperation between farms:

- **Organizational Complexity:**
  - In shared or open pasture systems, it's difficult to coordinate treatment schedules and diagnostics across multiple owners.
  - Conflict risks if some owners opt out or don't follow the agreed protocol.
- **Standardization Issues:**
  - Different veterinarians may follow different protocols, making cross-farm harmonization harder.
- **Increased Communication Needs:**
  - Requires shared record-keeping, planning meetings, and perhaps group contracting of vets/labs → administrative time and effort

- **Regional Biosecurity Enhancement:**
  - Coordinated implementation among farms using shared pastures or stabling increases parasite control effectiveness across regions.
  - Reduces cross-contamination, supports quarantine protocols for new arrivals, and enhances disease surveillance.
- **Resource Sharing & Economies of Scale:**
  - Joint vet contracts, and shared data at lower costs and administrative burdens.
  - Strengthens vet-farmer communication and standardization across facilities.
- **Harmonized Practices & Professional Collaboration:**
  - Encourages the development of regional guidelines, peer learning, and shared responsibility for resistance prevention.
  - Fosters a culture of responsible parasite management beyond individual farms.

Additional Resources

Websites/Model Companies

- https://www.equisal.co/
- Germany: https://koprolab-keck.de/
- Germany/Netherlands: https://wurmbekampfung.eu/wurmbekaempfung-pferde/

Publications

- Rendle D., Austin C., Bowen M., Cameron I., Furtado T., Hodgkinson J., McGorum B., Matthews J. Equine De-Worming: a Consensus on Current Best Practice Roundtable. UK-Vet Equine. 201119. Vol. 3, No. Sup1. https://doi.org/10.12968/ukve.2019.3.S.3
- Rendle D., Hughes K., Bowen M., Bull K., Cameron I., Furtado T., Peachey L., Sharpe L. Hodgkinson J. BEVA primary care clinical guidelines: Equine parasite control. Equine Vet J. 2024;1–32. DOI: 10.1111/evj.14036
- Ruben Francisco DVM a, Adolfo Paz-Silva DVM, PhD, DipEVPC a, Iván Francisco DVM, PhD a, Francisco Javier Cortiñas DVM a, Silvia Miguélez DVM a, José Suárez DVM a, Cristiana Filipa Cazapal-Monteiro DVM a, José Luis Suárez DVM, PhD b, María Sol Arias DVM, PhD a, Rita Sánchez-Andrade PhD a Preliminary Analysis of the Results of Selective Therapy Against Strongyles in Pasturing Horses - ScienceDirect
- José Ángel Hernández, Rita Sánchez-Andrade, Cristiana Filipa Cazapal-Monteiro, Fabián Leonardo Arroyo, Jaime Manuel Sanchís, Adolfo Paz-Silva & María Sol Arias: A combined effort to avoid strongyle infection in horses in an oceanic climate region: rotational grazing and parasiticidal fungi | Parasites & Vectors | Full Text

Further Information

- AAEP Internal Parasite Control Guidelines: https://aaep.org/wp-content/uploads/2024/05/Internal-Parasite-Guidelines_Updated.pdf
- A Guide to the Treatment and Control of Equine Gastrointestinal Parasite Infections, ESCCAP Guideline 08 Second Edition – March 2019. https://www.esccap.org/uploads/docs/c14bnmhx_0796_ESCCAP_Guideline_GL8_v10_1p.pdf
- Koprolab Keck, Infoblatt zum Start in die zeitgemäße selektive Entwurmung https://koprolab-keck.de/wp-content/uploads/2025/01/Infoblatt-ZSE-KK-2024.pdf

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Annex

Ideas to Animate a Workshop About the Solution

- Ask a veterinary laboratory to sponsor the workshop (e.g. covering diagnostic test kits, providing info material, or co-funding the event).
- Find a model horse farm that already practices selective deworming to host the workshop.
- Let participants observe and take part in diagnostic tasks, such as collecting fecal samples, interpreting lab results, or discussing treatment plans with a vet.

Proposed Structure for the Workshop on on Selective Deworming in Horse Stables

1. Introduction to Selective Deworming

- What is Selective Deworming?
- Why move away from traditional deworming schedules?
- Key principles: diagnostics first, targeted treatment, monitoring.
- Overview of diagnostic methods: Fecal Egg Count (FEC), Coproculture, PCR, ELISA.

2. Benefits of Selective Deworming in Horse Management

- Animal Health: Less drug resistance, better gut microbiome preservation.
- Cost Efficiency: Fewer drugs, smarter use of vet services.
- Sustainability: Reduced chemical residues in soil and water.
- Farm Reputation: Modern, science-based, welfare-oriented practices.

3. Practical Applications on Horse Farms

- Integration into annual farm routines (spring/autumn sampling).
- Group vs. individual diagnostics – how to manage large herds.
- Interpreting test results and making treatment decisions.
- Documentation and monitoring systems.

4. How to Choose the Right Approach

- Assessing your farm's current parasite control strategy.
- Choosing the right lab or in-house solution (not possible in every EU country due to regulation of veterinary acts).
- Evaluating costs: outsourcing vs. self-analysis.
- Practical aspects: sample handling, storage, and timing.

5. Hands-On Demonstration

- Live demonstration of sample collection from paddocks/stalls.
- How to label and store samples properly.
- On-site microscope demo (if feasible).
- Example: Interpreting a FEC result and deciding on treatment.

6. Maintenance and Troubleshooting

- When and how to repeat tests.
- Dealing with inconsistent results.
- Combining FEC with other tests (coproculture, ELISA).

7. Case Studies and Real-World Examples
- Two model farms: before and after implementing selective deworming.
- Practical changes in workflow and cooperation with veterinarians.
- Lessons learned: resistance prevention, cost control, improved horse health.

8. Cost Analysis and Return on Investment (ROI)
- Start-up vs. running costs: tests, vet time, time for collection.
- Reduction of long-term deworming costs.
- Long-term savings due to reduced health risks and resistance.
- Sharing costs in group stables or boarding facilities.

9. Q&A Session
- Open discussion: What concerns do participants have?
- Exchange of experiences and perceived obstacles.
- Input from sponsoring vets/labs: Support and advice options.

10. Wrap-Up and Resources
- Summary of benefits and key takeaways.
- Printed or digital handout: diagnostic schedule, lab contacts, tracking sheets.
- Access to educational videos or apps for parasite monitoring.
- Info on available discounts from partner labs or training opportunities.