Technical Sheet for Solution Implementation

Pain Assessment Tools

Thematic Area: Health and Welfare.

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

Need: Pain management: What are the tools to recognize pain and take it into account more effectively?

Solution EU Number: HE-04.

Content of the Solution: Using tools like Horse Grimace Scale or Ridden Horse Pain Ethogram to detect heatlh issues.

Key Contacts:

- Vets, ethologists.

Reasons for Implementing this Solution

Pain assessement tools like Horse Grimace Scale or Ridden Horse Pain Ethogram provide reliable, early detection of pain and health issues in horses, including subtle signs that may otherwise be misinterpreted as behavioral issues or overlooked entirely.

Description of Solution Strategies

Pain in equines is often difficult to detect and may be misinterpreted as undesired or aggressive behaviour, potentially leading to chronic stress and reduced performance.

To address this, Dr Emanuela Dalla Costa and colleagues developed the Horse Grimace Scale (HGS) within the EU project Animal Welfare Indicators (AWIN). The HGS allows pain assessment in horses at rest by observing facial expressions for one minute. Key indicators include:

a) Stiff, backward-facing ears.
b) Tension above the eyes.
c) Orbital tightening.
d) Prominent, strained chewing muscles.
e) Strained mouth and pronounced chin.
f) Flared nostrils and a flattened profile.

The HGS was validated using analgesia: pain-related facial expressions disappeared in horses receiving pain relief or were absent prior to painful procedures.

For horses under saddle, behavioural signs such as 'unwillingness' to work may indicate musculoskeletal pain, often caused by back, neck, or limb issues, poor tack fit, or inappropriate riding. The **Ridden Horse Pain Ethogram (RHpE)**, developed by Dr Sue Dyson and colleagues, identifies 24 specific behaviours that occur significantly more often in horses experiencing pain.

Both offer practical methods for early pain detection in different contexts—at rest and during exercise. Their application supports timely diagnosis and intervention, helping to prevent the escalation of unnoticed pain-related conditions.

See in additional resources how to access and use these grids.

Implementation Steps

1. **Familiarise Yourself with the Tools**
   Begin by consulting the recommended resources listed in the "Additional Resources" section of the Technical Sheet. Understand the key features of the Horse Grimace Scale (HGS) and the Ridden Horse Pain Ethogram (RHpE).

2. **Conduct Regular, Low-Interference Observations**
   Observe your horse for about 5 minutes on multiple occasions—such as in the stable, pasture, during saddling, and while being ridden. Whenever possible, observe unobtrusively (e.g. via camera or from a distance) to avoid influencing the horse's natural behaviour.

3. **Record Behaviour and Facial Expressions**
   Document any behaviours under saddle and look for the specific facial cues described in tools. Use a checklist or app if available to support consistent observations over time.

4. **Evaluate and Monitor Signs of Pain**
   If your observations reveal a critical number of RHpE behaviours or HGS indicators, check the horse's basic clinical parameters (e.g. body temperature, heart rate, respiratory rate). Repeat observations after a short interval to confirm consistency.

5. **Take Action if Pain is Suspected**
   If pain-related behaviours persist or clinical signs confirm concern, consult with your veterinarian. Also involve an experienced trainer or saddle fitter to rule out riding technique or equipment issues.

6. **Integrate into Routine Management**
   Make pain observation a regular part of your management routine—during grooming, tacking up, training, and turnout. Share findings with your team to ensure early detection becomes a shared responsibility.

Pain Assessment Tools

How Will this Solution Impact the Performance of your Farm ?

TOPIC	SCORE
Social	0.83
Economics	0.33
Welfare	1.50
Health	1.33
Environmental	0
Land access and management	0
Global	0.67

Color coding explanation

Socioeconomics: This solution will support the social performance of the farm because addressing equine pain visibly improves the farm's image, strengthens social acceptance, and fosters a more positive working environment, which may indirectly enhance customer trust.

This solution will not impact the economic performance of the farm because the costs of training and implementation balance out the financial benefits, resulting in no immediate return.

Health & Welfare: This solution will support the farm's health performance by enabling the recognition of pain resulting from disease, injury, or tissue damage. It enhances responsible ownership. As a result, farms using this solution can quickly implement veterinary interventions to diagnose and treat the source of pain. It will also enhance the farm's welfare performance, as reducing pain directly contributes to maintaining high welfare standards.

Environmental Sustainability: This solution will not have effect on the environmental performance of the farm because here are no direct effects. This solution will not have effect on the land access or management performance of your farm because there are no direct effects.

Globally, this solution will support the performance of the farm.

Pain Assessment Tools

How Will this Solution Impact the Resilience of your Farm?

TOPIC	SCORE
Social	0.28
Economics	0.33
Welfare	0.89
Health	0.81
Environmental	0
Land access and management	0.17
Global	0.40

Socioeconomics: This solution won't have any effect on socioeconomic performance of the farm facing external challenges because it does not provide direct, measurable economic benefits during crises like inflation or pandemics. While early pain recognition may help detect illness sooner and improve animal care during disease outbreaks, these effects are indirect, highly scenario-dependent, and already expected by customers, who are unlikely to pay more for this skill alone.

Health & Welfare: When the farm faces external challenges, this solution will support its health performance by enabling the early detection of pain related to health issues. This allows the owner to reduce both animal suffering and potential mortality, while also minimizing the need for medication by helping to prevent the transmission of infectious and non-infectious diseases. As a result, the farm becomes more resilient to external pressures.

Moreover, the solution will directly improve the farm's welfare performance by contributing to a better emotional state for the horses. Consequently, breeders or horse livery yard owners will be better equipped to maintain high welfare standards for their animals facing external pressures.

Pain Assessment Tools

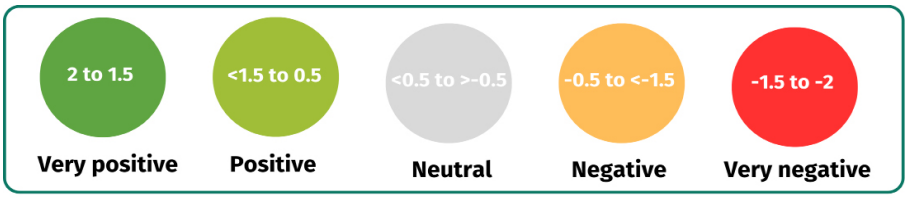
How Will this Solution Impact the Resilience of your Farm?

Environmental Sustainability: This solution will not impact environmental or land access performance of the farm facing external challenges assessed because there is no direct effect.

So this solution will not have impact on global resilience of the farm but can support health and welfare specific resilience facing external challenges.

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

CHALLENGES	SCORE
Inflation	0.39
Pandemic	0.36
High welfare standards	0.44
High infectious diseases	0.64
Extreme weather event	0.25
Loss or limited access to grassland	0.25



Pain Assessment Tools

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

Inflation & Social Crises: This solution will not impact the global performance of the farm facing inflation because early pain recognition does not affect major cost drivers or improve economic efficiency, offering no direct financial gain in a context of rising expenses.

This solution will not impact the global performance of the farm facing pandemics because although it supports animal welfare, it is already expected by clients and does not enhance operational resilience or reduce the farm's vulnerability to staff shortages or supply disruptions.

Welfare & Diseases: This solution will enhance the global performance of farm operations when facing infectious disease challenges by empowering stable managers to respond effectively. As a result, the farm becomes more globally prepared for such events.

Its contribution to the farm's overall performance in adapting to mandatory high welfare standards is modest but meaningful. By providing a robust foundation for health protection, the solution supports consistent performance through improved public perception as a well-managed and animal-friendly facility.

Climate Change & Access to Land: This solution will not impact the global performance of the farm facing extreme weather events (abnormally high temperatures and/or drought). However, it does have some positive effect on working conditions, profitability, equine welfare, and health when farms recover from extreme weather events helping to react more quickly.

This solution will not impact the global performance of the farm facing loss or limited access to agricultural land.

So this solution will support the farm resilience particularly in case of high infectious diseases.

Cost-Benefit Analysis

Costs

Socioeconomics:

- **Initial training required:** Owners, riders, or stable staff may need instruction to reliably recognise pain indicators, which entails time and financial investment.
- **Cost of professional consultation:** When pain is suspected, expert follow-up (veterinarians, orthopedics, saddle fitters) may be necessary and expensive.
- **Potential overreactions or misinterpretations:** Without sufficient training, pain-related behaviours could be misread, leading to unnecessary treatments or changes in management.
- **Software or app costs:** In digital implementations, subscription fees or app costs may apply.
- **Increased management complexity:** Integrating pain observation into daily routines may initially demand more time and coordination from the team.
- **Emotional burden for caretakers:** Observing pain without the means or knowledge to address it immediately can lead to frustration or emotional stress.

Health & Welfare:

- **False positives:** Some pain-related behaviours may stem from other emotional states (e.g., fear, frustration) or be influenced by tack or training, leading to possible misjudgement.

Benefits

- **Early detection reduces treatment and management costs,** as health issues are addressed before they become chronic.
- **Increased safety for riders, handlers, and horses**, due to early recognition of pain-related risk behaviours.
- **Reduced financial loss due to avoided performance downtime,** emergency care, or premature retirement.
- **Improved reputation and public trust** (social license), especially in professional and sport settings.
- **Horses stay in work longer and more consistently,** increasing the return on investment over the horse's lifetime.

- **Pain can be recognised and treated earlier,** shortening the duration of suffering and preventing escalation.

Pain Assessment Tools

Cost-Benefit Analysis

Costs

Health & Welfare:

- **False negatives:** Certain pain signs may be masked by training, equipment, or stoic behaviour, resulting in missed detection and delayed care.

Environmental Sustainability:

- No effect.

Benefits

- **Improved well-being beyond physical pain,** as recognizing discomfort leads to better care and a more positive emotional state.
- **Faster return to health and positive behavioural state,** strengthening the human–horse bond.
- **Identification of optimal husbandry and stabling conditions,** allowing for more individualised environments.
- **Prevention of misinterpreting pain as "bad behaviour",** reducing inappropriate disciplinary responses.
- **Better understanding of what each horse prefers or tolerates,** leading to more respectful and effective handling.
- **Improved training and performance management,** with fewer misunderstandings between horse and rider.
- **Supports responsible ownership,** helping horse owners make informed decisions and avoid unnecessary suffering.

- **Potentially Lower pharmaceutical use through earlier, less intensive interventions**, reducing environmental contamination.

Pain Assessment Tools

Cost-Benefit Analysis

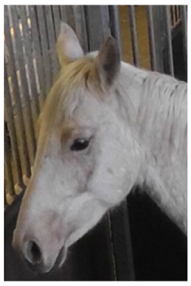
Costs

Cooperation between farms:

- **Risk of disagreement or uncertainty:** Conflicting interpretations between staff members (e.g., trainingstable vs. breeder) may cause tension or indecision.

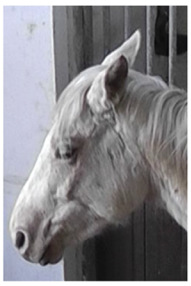
Benefits

- **Encourages teamwork among veterinarians, trainers, saddle fitters, and caretakers,** promoting integrated care.
- **Supports communication and transparency,** especially in professional or shared settings.



Facial Coding Unit	Score
Ears stiffly backwards	1
Orbital tightening	0
Tension above eye area	0
Prominent strained chewing muscles	0
Mouth strained and pronounced chin	0
Strained nostrils and flattening of the profile	0
Total pain score	1

a.

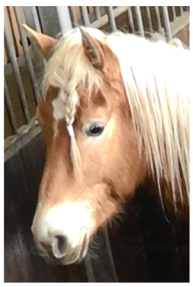


Facial Coding Unit	Score
Ears stiffly backwards	2
Orbital tightening	2
Tension above eye area	0
Prominent strained chewing muscles	2
Mouth strained and pronounced chin	1
Strained nostrils and flattening of the profile	1
Total pain score	8

b.

Facial Coding Unit	Score
Ears stiffly backwards	0
Orbital tightening	0
Tension above eye area	1
Prominent strained chewing muscles	0
Mouth strained and pronounced chin	0
Strained nostrils and flattening of the profile	0
Total pain score	1

c.



Facial Coding Unit	Score
Ears stiffly backwards	0
Orbital tightening	0
Tension above eye area	1
Prominent strained chewing muscles	0
Mouth strained and pronounced chin	0
Strained nostrils and flattening of the profile	0
Total pain score	1

d.

Additional Resources

Access to grids and tools

- Equine Discomfort Ethogram – free access to tables and videos included here: Torcivia, C., McDonnel, S. 2021. Equine discomfort ethogram. Animals. 11, 580 https://doi.org/10.3390/ani11020580

RHpE

- Checklist: https://static1.squarespace.com/static/630264eadd08da74c4f27a5a/t/654d2db62db8fa2032d7e327/1699556791332/RHpE_Checklist_Checklist_final.pdf
- https://www.thehorsephysio.co.uk/understanding-and-using-the-ridden-horse-pain-ethogram/
- Video in english with subtitles: https://www.youtube.com/watch?v=hrZgtrqbMVI
- Video in english: https://www.youtube.com/watch?v=PXNPTGkhYrc&list=PLC4xewdnak0GmWQX6PGmJ0X5UVveKkP-U

HGS

- Checklist (free access):
  - Face expressions: https://www.researchgate.net/profile/Dirk-Lebelt/publication/260950013/figure/fig2/AS:214093693755444@1428055322845/The-Horse-Grimace-Pain-Scale-with-images-and-explanations-for-each-of-the-6-facial-action.png
  - Scoring: https://www.researchgate.net/profile/Dirk-Lebelt/publication/260950013/figure/fig3/AS:214093693755446@1428055322902/HGS-scores-are-presented-on-the-y-axis-1-SE-for-horses-undergoing-routine-castration.png
- Equine 'Pain Face' Explained - Dr Karina Bech Gleerup: https://www.youtube.com/watch?v=UwoETBDQevc
- Press article :
  - https://horsesandpeople.com.au/the-horse-grimace-scale-helps-recognise-pain/
  - https://horsefriends.podigee.io/37-new-episode
- Equine Pain Face Poster for free (sign up required): https://mailchi.mp/horsesandpeople/equine_pain_face_poster

Workshops and online classes

- https://www.horsesinsideout.com/sue-dyson
- Further information: https://www.youtube.com/watch?v=ts2e1FaEuLY

Additional Resources

Publications

- Cook, W. R. (2003). Bit-induced pain: a cause of fear, flight, fight and facial neuralgia in the horse. Pferdeheilkunde, 19(1), 75-82. Free access on Google scholar.
- Dalla Costa, E., Minero, M., Lebelt, D., Stucke, D., Canali, E., & Leach, M. C. (2014). Development of the Horse Grimace Scale (HGS) as a pain assessment tool in horses undergoing routine castration. PLoS one, 9(3), e92281. https://doi.org/10.1371/journal.pone.0092281 (free access)
- Dalla Costa, E., Stucke, D., Dai, F., Minero, M., Leach, M. C., & Lebelt, D. (2016). Using the horse grimace scale (HGS) to assess pain associated with acute laminitis in horses (Equus caballus). Animals, 6(8), 47. https://doi.org/10.3390/ani6080047 (free access)
- Dalla Costa, E., Bracci, D., Dai, F., Lebelt, D., & Minero, M. (2017). Do different emotional states affect the horse grimace scale score? A pilot study. Journal of Equine Veterinary Science, 54, 114-117. https://doi.org/10.1016/j.jevs.2017.03.221
- Dyson, S., Berger, J. M., Ellis, A. D., & Mullard, J. (2017). Can the presence of musculoskeletal pain be determined from the facial expressions of ridden horses (FEReq)? Journal of veterinary behavior, 19, 78-89. https://doi.org/10.1016/j.jveb.2017.03.005
- Dyson, S. (2016). Evaluation of poor performance in competition horses: A musculoskeletal perspective. Part 1: Clinical assessment. Equine Veterinary Education, 28(5), 284-293. Free access on Google scholar.
- Dyson, S. (2022). The ridden horse pain ethogram. Equine Veterinary Education, 34(7), 372-380. doi: 10.1111/eve.13468. https://doi.org/10.1016/j.jveb.2017.10.008 https://beva.onlinelibrary.wiley.com/doi/epdf/10.1111/eve.13468 (free access)
- Dyson, S., Palmer, S. (2023) Harmonious horsemanship. Matador, Leicester, UK. https://www.harmonioushorsemanship.co.uk/
- Gleerup, K. B., Forkman, B., Lindegaard, C., & Andersen, P. H. (2015). An equine pain face. Veterinary anaesthesia and analgesia, 42(1), 103-114. https://doi.org/10.1111/vaa.12212
- Torcivia, C., McDonnel, S. 2021. Equine discomfort ethogram. Animals. 11, 580 https://doi.org/10.3390/ani11020580 (free access)

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Pain Assessment Tools

Annex

Ideas to Ideas to Animate a Workshop about the Solution

- **Partner with a veterinary clinic,** equine welfare organisation, or a tack store for sponsorship.
- **Choose a model farm or equestrian centre** with well-socialised horses for live demonstrations.
- Invite **a trained veterinarian or ethologist** as a guest speaker.
- Prepare **printed ethograms, photos and video clips** for comparison and exercises.

Proposed structure for the workshop on Pain Assessement Tools in horse stables

1. Introduction to Pain Assessment Tools
- What are the Horse Grimace Scale (HGS) and Ridden Horse Pain Ethogram (RHpE)?
- Give an overview of scientific background and development .
- Key features: non-invasive, low-cost, based on observable behaviour.
- Give an overview of tools and scoring systems.

2. Benefits of implementing Pain Assessment Tools in Horse Stables
- Better horse welfare through early detection.
- Cost savings by preventing severe health issues.
- Improved training outcomes and riding safety.
- Support of responsible equine management and transparency (e.g. social license).

3. Practical Applications on Horse Farms
- Use in the stable (e.g. during feeding, grooming).
- Use during riding (e.g. warm-up, dressage, jumping).
- Integration into routine health checks.
- Use of observation protocols and scoring sheets.

4. How to Choose the Most Suitable Approach
- When to use wich system?
- Features or technical aids such as posters, handouts, apps.

5. Hands-On Demonstration
- Live horse demo: guided observation of facial expressions (HGS).
- Video-based scoring: practice identifying behaviours from RHpE.
- Group work: interpreting case examples and discussing scoring results.
- Optional: Try scoring a horse's facial expression "blind" (pre/post vet exam).

6. Maintenance and Troubleshooting
- Distinguishing pain signs from other emotional states.
- Influence of equipment and training on behaviour.
- Observer bias and how to reduce it.
- When to call a vet, when to observe again.

7. Case Studies and Real-World Examples
- Farms or rehab centres successfully using HGS/RHpE.
- Key insights from caretakers or trainers.
- What changed after regular pain detection was introduced.

8. Cost Analysis and Return on Investment (ROI)
- Low investment in training, high impact on horse health.
- Avoided costs from late diagnoses or performance loss.
- Improved communication with clients/owners.
- Potential long-term benefits in sport, breeding, and longevity.

9. Q&A Session
- Open discussion with all participants.
- Address concerns about validity, interpretation, or workload.
- Share personal experiences and solutions.

10. Wrap-Up and Resources
- Summary of learning outcomes.
- Distribution of observation sheets, reference charts, and further readings.
- Info about certified courses or apps.
- Possibility of follow-up workshops or stable consultations.