Technical Sheet for Solution Implementation

Automatic Roughage Feeder

Thematic Area: Socio-economic performance.

Priority: How can working conditions be improved?

Need: How to decrease the arduousness of work?; How to improve working conditions?

Solution EU Number: WC-3.

Content of the Solution: Automatic feeders with or without transponder collar or leg band, hayracks to reduce workload and optimize roughage feeding of horses for both individual and group housing.

Key Contacts:
- Specialized companies and advisors.

Case Study: Not available.

Reasons for Implementing this Solution

Streamlined work processes saves time and provides physical relief while simplifying work and preparation. Centralised workflows enhance organization and flexible feeding schedules eliminate time constraints. Animal-specific feeding is easily managed without extra effort, ensuring needs are met efficiently. Predictable processes enable better planning and consistency of working procedures.

Description of Solution Strategies

An automatic hay rack is available both for individual feeding in stalls and as a rack for group housing. A distinction is made between hay racks with several feeding places and systems that are transponder controlled. The latter enables the individual feeding of each horse in group housing. Automated hay racks do not regulate the amount of hay but the opening times at which the horses have access to the hay.

The transponder-controlled hay racks work as follows: when a horse enters the feeder, it is identified by a transponder on the mane or a collar and the horse is given access to the feeder, the hay rack opens. After an individually programmed period of time, the hay rack closes, and the horse leaves the feeder.

Implementation Steps

1. Determine your needs: Identify the number of horses and the required number of automatic feeder/automatic hay racks, well as the work processes and time factors required to date.

   Please consider different aspects to determine your needs:
   - If the access to hay is going to be limited: you can calculate the daily ration of hay and use it to determine feeding times. The general feeding recommendation is 1.5 - 2 kg hay/100 kg live weight. Of course, this must be adjusted individually and ideally straw or similar should be offered for nibbling to avoid too long waiting times.

- The results of preliminary studies indicate that the investigated time-controlled hay racks must provide at least three times as many feeding places as there are horses to ensure that neighboring horses can keep their individual distance and stress-free feeding is possible.

- Research on non-automated feeding shows that it's best to have feeding spaces placed 10 m appart (if less, they should be constructed such that they can't see each other during feeding itself (but scan the surroundings when lifting the head, like e.g. in well-designed feeding stands) and to have a ratio of 1,5:1 feeding places: horses. It's difficult to transfer this to automatic feeders, but since generally horses tend to synchronize their activities, in particular related to feeding, it would be ideal, if all horses can show feeding behaviour at the same time (if not all at the same time at a hay feeder, there should be straw ad libitum available). Taking into account that horses under natural conditions spend 12-16 hours feeding/day, there should be at least half as many feeding places as there are horses in ideal conditions. Therefore, from an ethological point of view the best solution are automatic feeders of such types that allow all horses simultaneously access to hay (with sufficient space between feeding places or good visual barriers) for a limited amount of time or for a limited amount of hay.

2. Seek advice from specialized companies on site at your farm, obtain various quotes and compare them.
3. Choose the right design: Select a feeding system that suits your farm and the needs of your horses. Take into account potentially necessary (re)construction measures.
4. Plan the installation: Create a detailed plan for the installation, including the dimensions and location of each automated hay rack. Consider the movement space for the horses and staff.
5. Staff and horse training: Train your staff to use the new feeding system efficiently and safely. Gradually introduce your horses to the new system to ensure they feel comfortable and know how to access their feed.

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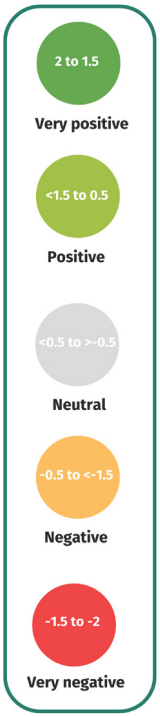
How Will this Solution Impact the Performance of your Farm ?

TOPIC	SCORE
Social	1,00
Economics	0,50
Welfare	0,80
Health	0,15
Environmental	0
Pasture access and management	0
Global	0,41



Color coding explanation

Socioeconomics: This solution will have a positive effect on social and economic performance of the farm globally because it enhances social outreach with its innovative design and clearly simplifies work by saving labor and time. Nevertheless, concerns include potential animal injuries, increased workload in case of impaired equipment, and high costs impacting profitability have to be considered.

Health & Welfare: This solution can have a positive effect on the good maintenance of horses if well used. Unfortunately, the results of scientific studies on the effect of automatic feeders on health and welfare are scarce and inconsistent, highly dependent on the type of feeder and duration of feeding bouts. Trapping into the feeder may cause injuries. Actually, when the time of feeding is limited, the feeders also can provoke frustration, “hay-hunger” and aggression.

Environmental Sustainability: Globally this solution will not impact the environmental performance of the farm. If the automatic feeder is combined with a «selection gate», it is possible to automatically regulate access to pastures and thus improve soil & grass management.

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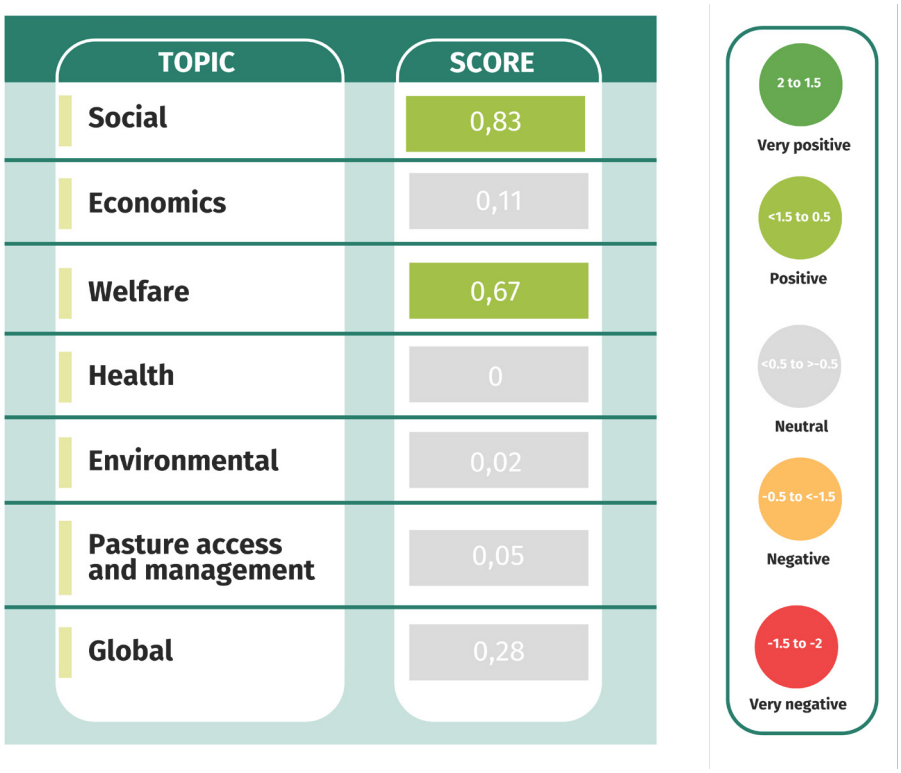
How Will this Solution Impact the Resilience of your Farm?



Socioeconomics: The farm's resilience is enhanced from social point of view because this solution will support social performance facing external challenges by savings in manpower and time. From economic point of view, the effect is neutral while electricity consumption adds to costs, these can be mitigated through sustainable energy solutions like solar power. And while the high cost of investment can weaken profitability facing challenges, savings of time and labor associated can mitigate this impact.

Health & Welfare: This solution can help to be more resilient from a welfare point of view because facing lack of workers or increase of labor costs due to external challenges, this solution can help to maintain good maintenance of horses so good level of welfare performance.

Environmental Sustainability: The overall effect of this solution on farm resilience from an environmental sustainability perspective is neutral.

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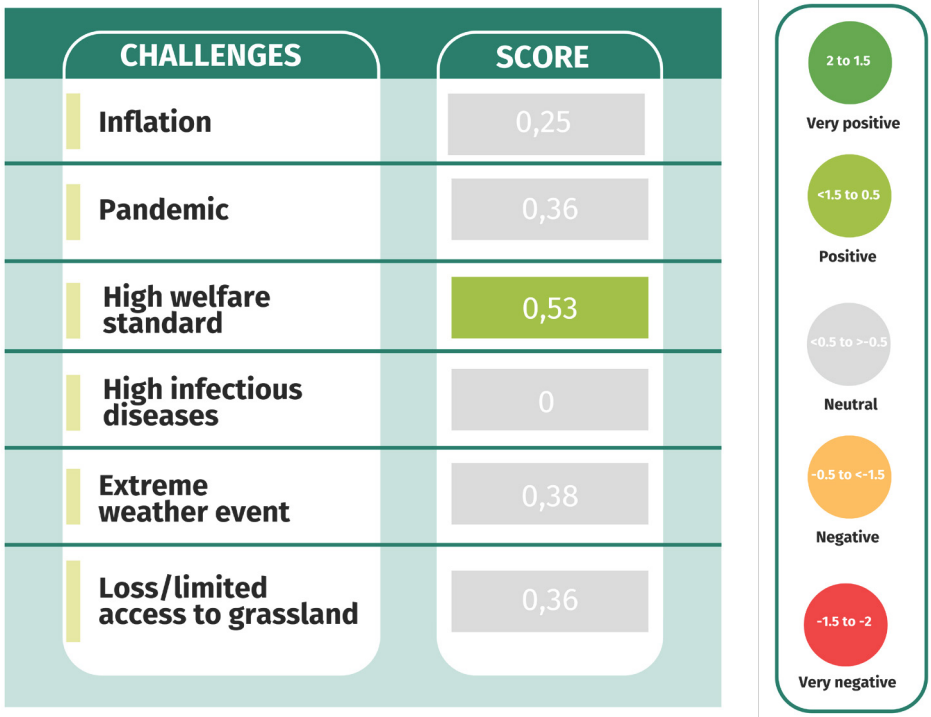
How Can this Solution Help your Farm Cope with Specific External Challenges to Become More Resilient?



Inflation & Social Crises: This solution will not help to be globally more resilient facing inflation or a pandemic. The effect is neutral. Facing inflation for example, this solution enhances farm resilience by reducing working hours in feeding animals, but it may struggle with increased production costs due to higher maintenance and staffing needs.

Welfare & Diseases: This solution can help to be more resilient facing new welfare regulations, such as requiring group housing, it can have a positive impact in terms of environmental enrichment with individually adjusted feeding but the risk of feeding frustration in horses waiting for the meals should be taken into account, as the number of place per horse to access to feeders. The system may pose challenges during infectious disease outbreaks, as shared feeders increase infection risk, requiring careful management and potentially more staff, impacting resilience under such conditions. But it will depend more on the type of housing than the type of feeders.

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Climate Change & Access to Land: This solution will not help to be globally more resilient facing extreme weather event or loss or limited access to lands. The impact of extreme weather event was evaluated from abnormally high temperatures, excessive rainfall and draught perspective. It was not known at the time of the assessment whether the electronics of the automatic feeder can withstand extreme temperatures.

Cost-Benefit Analysis

Costs

Socioeconomics:

- High initial costs; approx. 1000 – 15.000 €.
- Electricity costs.
- If transponder-controlled feeding: workload to habituate the horses to the feeder; farmer needs necessary skills to do this task in safety.
- Improvisations required in the event of technical/power failures.
- With time-controlled hay racks without transponders, individual feeding in group housing is not possible.

Health & Welfare:

- Can cause stress if feeding schedule is not adapted to the horse´s need.
- Can cause aversive behavior around the feeder when it opens (automatic hay rack).
- Possibly frustration/increased agonistic behavior when feeding times to short.
- Transponder-controlled feeding in particular can lead to frustration and aversive behavior.

Benefits

- Increase social outreach for potential customers (for boarding services) but not necessarily for the general public.
- Decrease workload, manpower and time by filling the hay rack with wheel loader/tractor max. once a day.
- More flexibility, as not bound to feeding times; Work is no longer tied to certain hours.
- Limitation of hay waste.
- Encourages horse movement.

- Individual nutrition also possible in group husbandry.
- Restrictive feeding possible without too long breaks between feedings; weight management; feed presentation guaranteed.
- Better feeding management may reduce colics.
- Keeping horses occupied with feeding when allowed higher number of meals.

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Costs

Environmental Sustainability:

- Access to and use of electricity.

Cooperation between Farms:

- No effect.

Benefits

- If the automatic feeder is combined with a «selection gate», it is possible to automatically regulate access to pastures and thus improve soil & grass management.
- No external energy source required for solar-powered rack.

- No effect.

Additional Resources

Websites

- https://www.heufresser.com/produkte/
- https://www.turbo-heuautomat.de/
- https://aktivstall.de/de/hit-fuetterungstechnik/
- https://www.active-horse.com/
- https://www.growi.de/stall-weidetechnik/futterraufen-panels/futteraufen/weideraufe1
- https://360gradpferd.de/automatische-raufe-pferdefuetterung/
- https://www.raufomat.de/
- https://www.eco-ecurie.fr
- https://www.label-equures.com
- https://www.horse-stop.com
- https://360gradpferd.de/automatische-raufe-pferdefuetterung/
- https://www.pferderevue.at/aktuelles/haltung/2023/ad-lib--heunetz--futterautomat--drei-heufuetterungsvarianten-im-.html

Publications

- Mata, F., Boyton, G., & Young, T. (2024). Anticipatory Behaviour During the Approach to Feeding Times as a Measure of Horse Welfare. Animals, 14(24), 3677. https://doi.org/10.3390/ani14243677
- Seabra, J. C., Hess, T., do Vale, M. M., Spercoski, K. M., Brooks, R., & Dittrich, J. R. (2023). Effects of Different Hay Feeders, Availability of Roughage on Abnormal Behaviors and Cortisol Circadian Rhythm in Horses Kept in Dry Lots. Journal of Equine Veterinary Science, 130, 104911. https://doi.org/10.1016/j.jevs.2023.104911
- Baumgartner Miriam, Erhard Michael H., Zeitler-Feicht Margit H.(2023). Which animal-to-feeding-place ratio at time-controlled hay racks is animal appropriate? Preliminary analysis of stress responses of horses. Frontiers in Veterinary Science, 9, https://doi.org/10.3389/fvets.2022.1005102

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Annex

Ideas to Animate a Workshop About the Solution

- Ask a company specialized in horse husbandry and feeding systems to sponsor the workshop.
- Find a model farm where the workshop can take place.
- Complete the required tasks and let the participants take part in these demonstration tasks so that they can get to know the system.

Proposed structure for the workshop about using electric wheelbarrows in horse farms

1. Introduction to automatic roughage feeding
- What is automatic roughage feeding?
- Key features and components of automatic roughage feeding (e.g., material, quality).
- Types of automatic systems available on the market (e. g. automatic hayracks for group housing; autom. Hayracks for boxes; hay dispenser; transponder-controlled systems).

2. Benefits of automatic roughage feeding in horse stables
- Decreases workload, manpower and time for feeding.
- Offers more flexibility, as not bound to feeding time.
- Limitation of hay-waste.
- Improves feeding management.
- Positive effect on weight-management trough the possibility of restrictive hay-feeding without long breaks between feeding times.
- Individual feeding even in group housing possible.

3. Practical Applications on Horse Farms
- Individual adjustment for each kind of farm/housing system possible.

4. How to Choose the most suitable automatic feeding system
- Evaluation of the needs of the farm.
- Assessment of the structural requirements.
- Features such as material, construction, ease of use.
- Price comparisons.

5. Hands-On Demonstration
- Live demo of handling automatic feeding systems.
- Testing different (if available) models and giving participants a chance to try them out.
- Proper techniques for maximizing efficiency and reducing wear on the equipment.

6. Maintenance and Troubleshooting
- Cleaning and care of modules and parts such as screws, hinges, etc.
- Readjustment.

7. Case Studies and Real-World Examples
- Examples of farms or equestrian centers using automatic roughage feeding
- Discussion of how they have integrated these tools into their daily operations.
- Lessons learned and tips from farm operators who using this system.

8. Cost Analysis and Return on Investment (ROI)
- Initial cost modular systems vs. long-term savings in labor.
- How to calculate ROI based on farm size, workload, and usage.
- Financial benefits from reducing strain on workers and improving productivity.

9. Q&A Session
- Open floor for participants to ask questions about specific concerns or experiences.
- Address any uncertainties regarding the effectiveness or cost of modular facilities.

10. Wrap-Up and Resources
- Summary of key points covered in the workshop.
- Additional resources for further learning (websites, suppliers, online communities).
- How to access special discounts or offers on modular facilities if partnered with suppliers.