**Thematic area:**

Environmental sustainability.

**Priority:** How to improve biodiversity while maintaining equine activities?

**Need:** Predation risk management; Conflicts with large carnivores: in certain regions, farmers are victims of bear and wolf attacks.

**Solution EU number:** BD-1.

**Content of the solution:**

Identify and introduce protective animals (dogs, donkeys, or llamas) to protect horses from large predators.

**Key Contacts :**

- Breeders and trainers of protective dogs.

**Case Study:** Not available.

**Reasons for Implementing the Solution**

Protect livestock (particularly horses) from large predators like bears, wolves, and coyotes. Reduce livestock losses due to predation. Promote coexistence between livestock farming and wildlife conservation by reducing the need for lethal control methods.

**Description of Solution Strategies**

The introduction of guard animals such as dogs, donkeys, or llamas is an effective strategy to protect horses from large predators like wolves, bears, or coyotes. These animals can act as natural protectors due to their instincts to defend livestock and their territorial nature. Dogs, particularly livestock guardian breeds like Great Pyrenees or Anatolian Shepherds, are trained to protect and guard animals, providing a proactive deterrent to predators. Similarly, donkeys are naturally territorial and will often chase off predators, especially those that threaten their herd. Llamas are also known to be highly protective of other animals, using their size and vocalizations to warn off threats.

The choice of guard animal depends on various factors such as the type of predator in the area, the size and temperament of the horses, and the existing environment. Dogs typically require training and a bond with the herd, while donkeys and llamas can be more independent but still need to be introduced to the horses gradually. Each animal's protective role is complementary to the others, and the presence of multiple species could provide a layered defense against predators.

Guard animals can be used in combination with other protection strategies, such as fencing and surveillance, to increase overall effectiveness. Proper care and training of the animals are essential to ensure their success in guarding horses and other livestock, as well as their integration into the environment.

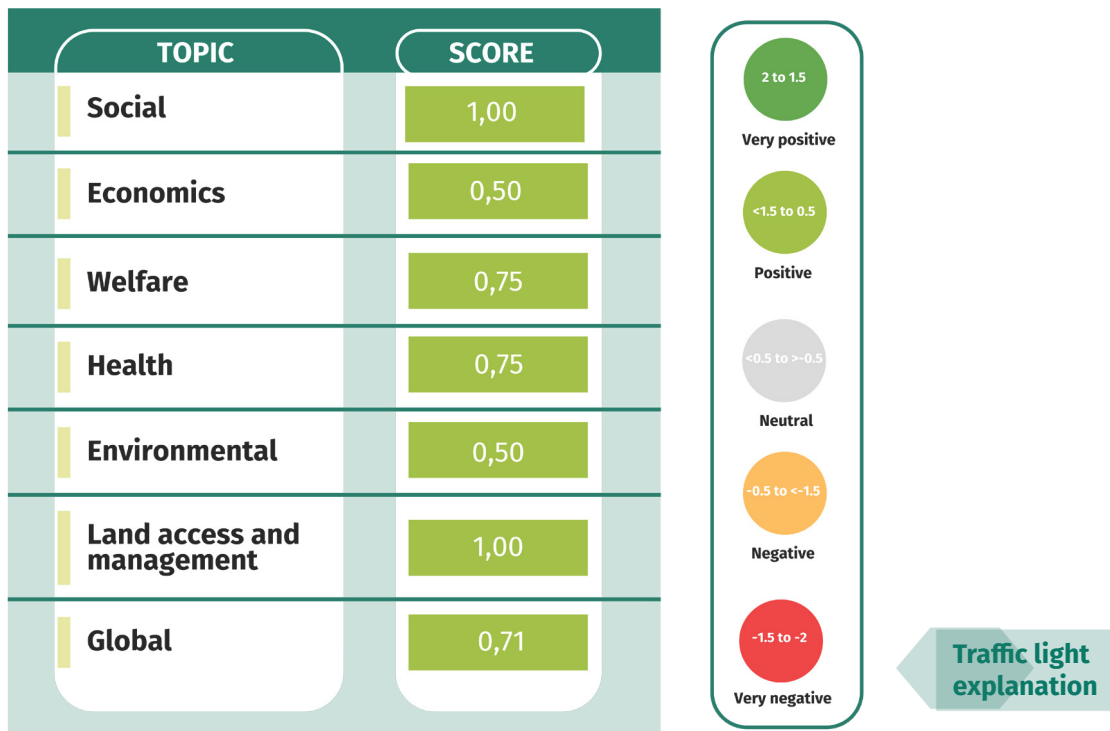


# Technical Sheet for Solution Implementation: Livestock Guardian Animals

## Implementation Steps

1. Assess Farm Needs & Select Appropriate Guard Animal Species.
  - Evaluate the farm's specific needs based on predator threats, the number of horses, and the farm environment.
  - Select a suitable guard animal species (dog, donkey, or llama) based on the nature of the predators and the farm's setup.
2. Research and Choose Suitable Breeds or Individuals.
  - Research and select dog breeds (e.g., Great Pyrenees, Anatolian Shepherd), donkeys, or llamas known for their protective instincts.
  - Consider temperament, size, and experience of the animals to ensure they can work well with horses and defend effectively.
3. Prepare Facilities & Fencing for the Guard Animal(s).
  - Set up secure enclosures, barns, or shelter areas for the new guard animals.
  - Ensure proper fencing to keep both the guard animals and horses safe from predators and prevent the animals from wandering.
4. Acquire and Introduce the Guard Animal(s) to the Farm.
  - Acquire the chosen guard animal(s) from reputable sources, ensuring they are healthy and fit for their role.
  - Gradually introduce the animals to the farm and the horses, allowing time for adjustment and socialization.
5. Train the Guard Animal(s) & Integrate Them with Livestock.
  - Use professional trainers or guides to train the guard animals in protection behaviors and ensure they bond with the horses.
  - Gradually integrate the guard animals with the livestock to allow them to get used to the horses' behaviors and territory.
6. Monitor & Adjust.
  - Regularly monitor the guard animals' performance, checking their interactions with the horses and their effectiveness in deterring predators.
  - Adjust if necessary, such as further training, improved fencing, or additional guard animals to reinforce the protection strategy.

## How Will this Solution Impact the Performance of your Farm?



**Socioeconomics:** The use of guard animals in farming enhances social outreach by integrating different species for «biological control» and horse guarding, creating a system closer to natural ecosystems. While initial costs for training and care may increase, profitability can improve over time due to fewer livestock losses and enhanced market appeal. Guard animals reduce farmers’ stress and workload by lessening the need for constant monitoring, allowing focus on other farm management tasks and improving work-life balance. This results in both social and economics positive scores. Pay attention to ensure that the animals used for protection are not aggressive towards local residents or tourists, which could lead to a negative image of the farm.



**Health & Welfare:** Avoiding injuries or deaths caused by predators would certainly contribute to saving the physical and health state of horses. The presence of other ungulate species may provide social support to horses, similarly to natural conditions according to “many-eyes-watching» hypothesis. Since the guard animals don’t prevent the appearance of predators, but only alarm or actively chase them, it is not sure if horses are not stressed in such situation. To increase the performance of the farm, this solution needs to be combined with regular monitoring and, if not efficient, with other solutions to protect horses.

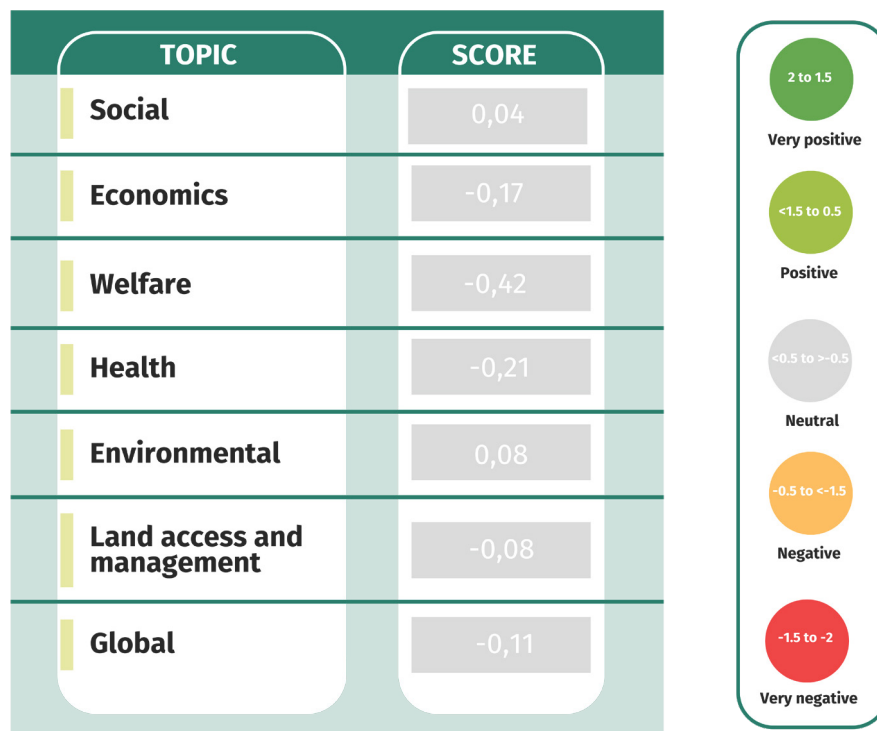


**Environmental Sustainability:** The use of guard animals reduces the need for energy-intensive predator control measures and by promoting healthier ecosystems and livestock management practices, it contributes to more resilient and adaptive farming systems that can better cope with climate variability. Introducing guard animals allows for a more harmonious coexistence between livestock and wildlife, reducing the need for lethal predator control methods. An increase in biodiversity in areas where guard animals are used, with the return of bird species, small mammals, and other wildlife due to reduced predation pressure and healthier ecosystems. Guard animals help protect grazing animals from predators, leading to more consistent and sustainable grazing. This reduces overgrazing in localized areas and encourages more even distribution of grazing pressure, which promotes plant diversity and healthier pastures. Improved grazing management contributes to better soil health and reduced erosion, further supporting grassland sustainability.

So this solution can help to support the performance of the farm.



## How Will this Solution Impact the Resilience of your Farm?



**Socioeconomics:** The positive aspects of the solution are probably outweighed by the negative aspects, resulting in neutral evaluation scores, meaning that facing external challenges socio-economic performance will not be affected positively or negatively.



**Health & Welfare:** Similarly to socioeconomic area, the positive aspects of the solution (social support, better resilience to predation by alarming or chasing the predators by guarding animals) are probably outweighed by the negative aspects, resulting in neutral evaluation scores.



**Environmental Sustainability:** Guard animals have somewhat neutral effect on the farm level resilience related to environmental sustainability. Meaning, that environmental and land access and management performances of the farm facing external challenges, would not be positively or negatively impacted by this solution.

So globally, this solution will not affect the performance of the farm facing external challenges.

## How Can this Solution Help your Farm to Face Specific External Challenges to be More Resilient?

CHALLENGES	SCORE
Inflation	0,04
Pandemic	-0,21
High welfare standards	0,17
High infectious diseases	-0,29
Extreme weather event	-0,29
Loss or limited access to grassland	-0,21

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:** Inflation increases the cost of maintaining guard animals, such as food and veterinary care, while limiting resources for expanding or improving infrastructure. However, guard animals help reduce losses from predation and lower the need for costly human intervention, providing long-term savings despite rising input costs. During a pandemic, supply chain disruptions and reduced staff availability may further strain the farm's operations, but guard animals offer resilience by maintaining livestock protection and reducing dependency on external predator management systems. Positive aspects could be counterbalanced by negative ones resulting in neutral scores.



**Welfare & Diseases:** Along with better protection from predators, if effective, this solution would decrease the occurrence of potential injuries or fatal incidents, thus having guarding ungulates or dogs in endangered areas would contribute to high welfare standards. Potentially, with other ungulate species, the risk of zoonoses should be taken into account. Facing high infectious disease, if donkey are used to protect horses, risks are high as they are most of the time concerned by the same diseases as horses, and this can lead to negatively affect the performance of the farm.



**Climate Change & Access to Land:** While guard animals contribute to sustainable farming practices, and their role in promoting ecosystem balance may provide some resilience, but this is not sufficient to halt impacts of extreme weather (abnormally high or low temperatures, drought, or excessive rain). Guard animals help distribute grazing pressure more evenly when pastures are available, but when access is limited, the remaining grassland may become overgrazed, leading to soil degradation. Guard animals cannot prevent soil damage caused by overuse in restricted areas. The welfare and health of guard animals should be considered facing extreme weather events, for instance the donkeys can suffer during frosty winters.



## Cost-benefit Analysis

### Costs

#### Socioeconomics:

- For whom: Equine farmers, local businesses.
- Initial investment in purchasing and training guard animals (€500-€2000 per animal).
- Ongoing costs for food, veterinary care, and training (€500-€1000 per year per animal).
- Farmers may need to adapt management practices to accommodate the guard animals.
- Potential injury to farm staff or tourists from aggressive guard animals.
- Opportunity cost of time spent on care and training.

#### Health & Welfare:

- For whom: Equine farmers, horses, guard animals.
- Guard animals can have a negative impact in terms of health, especially with zoonotic diseases and /or inter species transmission.
- Legal issues in some countries will limit some of these animals: Lamas.



### Benefits

- For whom: farmers, farm workers, horses.
- Reduced livestock losses, leading to increased profitability over time.
- Decreased reliance on human labor for constant monitoring of livestock.
- Reduced costs for alternative predator control measures (e.g., fences, traps).
- Improved working conditions due to lower stress related to predation, for example by reducing the psychological burden of dealing with predator attacks.
- The use of guarding animals promotes awareness of sustainable farming practices and biodiversity conservation (social outreach).



- For whom: Equine farmers, horses, guard animals.
- Horses experience lower stress levels due to reduced predator presence, which improves their overall health and welfare.
- Decreased risk of injury or mortality from predator attacks.

### Costs

- Donkeys can be aggressive to horses and are also territorial.
- The well-being and health issues of guarding animals need to be taken account .

### Environmental Sustainability:

- For whom: Local ecosystem, regional biodiversity.
- Using guard dogs might have a negative impact on behaviour and reduce genetic diversity for other wildlife than predators.
- Can reduce the genetic diversity of predators.



### Benefits

- Improved pasture management leads to better physical conditions for horses.
- Guard dogs can work and live in environment they are bred for – this could increase their wellbeing.
- Helps to preserve the genetic diversity of local endangered breeds.
- Reducing the need for energy-intensive predator control contributes to more resilient and adaptive farming systems that can be coped with climate variability.
- Reduced losses help to maintain stable grazing patterns, which can sequester more carbon into pastures and indirectly water management of the soil.
- Reduce the need for lethal predator control methods. This helps maintain predator populations and promotes a balanced ecosystem. An increase in biodiversity with the return of bird species, small mammals, and other wildlife and healthier ecosystems.
- More sustainable grazing patterns, which can lead to improved soil health and reduced erosion.

# Livestock Guardian Animals

## Costs

### Cooperation between Farms:

- Initial coordination and setup costs for shared programs.
- Potential management challenges.



## Benefits

- Potential for collaborative efforts between farms to implement shared guard animal programs, reducing overall costs.
- Community building and shared knowledge on sustainable farming and predator management.
- Can costs be divided between farmers?

## Additional Resources

- [Guard Llamas: A part of integrated sheep protection](#)
- <https://morningchores.com/livestock-guardian-animal/>
- <https://www.conservationevidence.com/actions/2433>
- <https://farmbarking.com/guides/farm-guard-dogs-a-comparative-study-of-different-breeds/>
- <https://farmbarking.com/guides/the-role-of-guard-dogs-in-protecting-livestock/>
- <https://theconversation.com/guardian-dogs-fencing-and-fladry-protect-livestock-from-carnivores-103290>
- <https://rurallivingtoday.com/livestock/livestock-guardian-animal-need/>
- <https://sanangelo.tamu.edu/files/2013/08/Livestock-Guardian-Dogs1.pdf>
- <https://agrilifetoday.tamu.edu/2023/10/23/livestock-guardian-dogs-unsung-heroes-of-the-livestock-protection-business/>
- [https://www.sheepusa.org/wp-content/uploads/2024/07/SGRJ\\_V39\\_12-19\\_Scasta\\_7-24.pdf](https://www.sheepusa.org/wp-content/uploads/2024/07/SGRJ_V39_12-19_Scasta_7-24.pdf)
- <https://www.motherearthnews.com/homesteading-and-livestock/guardian-llamas-zbcz1309/>
- <https://dr.lib.iastate.edu/server/api/core/bitstreams/6bd24cbb-c315-4d62-b216-b2f9754d0a42/content>
- <https://sprucelane.com/guardllamas.pdf>
- [https://niedersachsen.nabu.de/imperia/md/content/niedersachsen/faltblaetter/reactions\\_of\\_horses\\_to\\_wildlife\\_and\\_guarding\\_dogs\\_cdpnews24.pdf](https://niedersachsen.nabu.de/imperia/md/content/niedersachsen/faltblaetter/reactions_of_horses_to_wildlife_and_guarding_dogs_cdpnews24.pdf)
- <https://thehorse.com/1124275/protecting-your-horse-property-from-wildlife-predators/>
- <https://www.tandfonline.com/doi/abs/10.1080/090647000750069476>
- <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1002&context=icwdmsheepgoat>
- [https://kirj.ee/public/Ecology/2009/issue\\_3/ecol-2009-3-216-224.pdf](https://kirj.ee/public/Ecology/2009/issue_3/ecol-2009-3-216-224.pdf)
- [https://test.cdpnews.net/wp-content/uploads/2023/12/9\\_6\\_Ribeiro-et-Petrucci-Fonseca.pdf](https://test.cdpnews.net/wp-content/uploads/2023/12/9_6_Ribeiro-et-Petrucci-Fonseca.pdf)
- [https://cdpnews.net/wp-content/uploads/2023/11/cdpnews24\\_rigg\\_2022.pdf](https://cdpnews.net/wp-content/uploads/2023/11/cdpnews24_rigg_2022.pdf)
- [https://cdpnews.net/wp-content/uploads/2024/11/CDPnews28\\_1\\_Rossberg-et-al.pdf](https://cdpnews.net/wp-content/uploads/2024/11/CDPnews28_1_Rossberg-et-al.pdf)

## Publications

- Drufke, Natasha, ISU, 2000, The use of llamas to protect goats, cattle, and poultry from canid predators, <https://doi.org/10.31274/rtd-20201118-143>
- OMAFRA (2018) Guidelines for using donkeys as guard animals with sheep. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 4 p.

### Ideas to Animate a Workshop About the Solution:

- Ask a company specialized in livestock management or animal husbandry 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 on Guardian Animals in Horse Stables:

#### 1. Introduction to Guardian Animals

- What are guardian animals?
- Key features and components of guardian animals (e.g., breeds, training).
- Types of guardian animals available (dogs, donkeys, llamas).

#### 2. Benefits of Guardian Animals in Horse Stables

- Reduced Physical Strain: Less manual labor for farm workers, especially important for those with physical limitations.
- Cost Savings: Potential long-term savings on labor.
- Increased Efficiency: Faster response to predator threats.
- Promotes sustainable farming practices and biodiversity conservation.

#### 3. Practical Applications on Horse Farms

- Integration of guardian animals with horses.
- Group and individual stabling considerations.
- Enhances overall farm security and animal welfare.

#### 4. How to Choose the Most Suitable Guardian Animal

- Evaluation of the needs of the farm.
- Assessment of the structural requirements.
- Features such as breed suitability, temperament, and ease of training.
- Price comparisons.

#### 5. Hands-On Demonstration

- Live demo of handling the guardian animals.
- Testing different breeds and giving participants a chance to interact with them.
- Proper techniques for maximizing effectiveness and ensuring animal welfare.



### **6. Maintenance and Troubleshooting**

- Health care and veterinary needs.
- Training and socialization tips.
- Addressing behavioral issues and ensuring proper integration with livestock.

### **7. Case Studies and Real-World Examples**

- Examples of farms or equestrian centers using guardian animals.
- Discussion of how they have integrated these animals into their daily operations.
- Lessons learned and tips from farm operators using this system.

### **8. Cost Analysis and Return on Investment (ROI)**

- Initial cost of acquiring and training guardian animals vs. long-term savings in livestock protection.
- How to calculate ROI based on farm size, predator pressure, and usage.
- Financial benefits from reducing livestock losses 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 guardian animals.

### **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 guardian animals if partnered with suppliers.