Can we protect horses from fireworks?

An evidence-based report

August 2025

Introduction

This is the second report drawn from findings of the Fireworks and Horses survey, which was conducted by Redwings Horse Sanctuary over five weeks between December 2024 and January 2025. The survey attracted 5,128 complete submissions from UK adult horse owners and an initial summary report was shared in February 2025.[1]

The following document explores in more detail the challenges horse owners face when trying to protect equines from distress, harm and even death that can occur when individuals are exposed to fireworks.

Survey data has been grouped to offer new insights into some of the steps owners take to protect their horses and the effectiveness of those measures. Findings have been shared alongside evidence from other research as well as information on specific topics relevant to the report to provide context.

There are believed to be around 850,000 equines in the UK, in the care of over 330,000 horse-owning households. The industry contributes an estimated £8 billion to the UK economy and employs around 230,000 people[2].

Redwings Horse Sanctuary

Redwings cares for more than 1,200 rescued equines within a sanctuary setting and has over 700 additional individuals living in carefully selected loan homes. The charity has experienced the death of three resident horses as a result of fireworks being let off nearby. Their horse care teams put measures in place each year to reduce the risks presented by displays held around Bonfire Night, with significant time and cost involved.

Redwings aims to raise awareness of the potentially serious impact that fireworks can have on horses and support other owners who face challenges when trying to keep their horses safe. The charity launched its Keep Horses In Mind fireworks campaign in 2024. Redwings is also a member of the Fireworks Working Group; a coalition of diverse organisations who would like to see tighter regulations used to achieve a better balance between people's freedom to enjoy fireworks and a reduction in the unintended harms that displays can cause.

[1] Redwings Horse Sanctuary (2025) *Fireworks and Horses: a horse owner survey*. https://www.redwings.org.uk/fireworks
[2] British Equestrian Trade Association, *National Equestrian Survey 2023;* British Equestrian, *State of the Nation Report 2023*

Executive summary

The Fireworks and Horses online survey was conducted to gain insight into horse owners feelings and experiences around fireworks in relation to equines in their care. The survey gathered a total of 5,128 complete, eligible responses. Initial data was shared in a preliminary report published in February 2025.

This report shares findings from further analysis of the dataset, with focus on opportunities and challenges horse owners face when trying to keep horses safe during fireworks.

While some respondent bias is likely in any self-selecting survey, the data suggests that concern around fireworks is widespread among equestrians with more than 87% saying they worry about the potential impact of fireworks on their horse. More than two thirds of respondents had firsthand experience of distressing, sometimes tragic incidents as a result of fireworks being let off close to a horse in their care.

Almost 75% of survey respondents took steps to protect their horse from fireworks. However, the overall effectiveness of the measures taken was limited. Analysis shows that less than 7% of those who used prescription sedation felt the intervention was 'Very effective'. Data on use of non-prescription 'calmers' and noise-reducing headwear also suggest that these approaches have limited effectiveness.

Many owners make a decision on whether to stable or turn out their horse ahead of fireworks. The data suggests that while stabling may have reduced physical harm among respondents' horses overall, stabled horses were represented in all outcomes, including escape and injury. 2.3% of stabled horses died compared to 5.6% who were turned out.

Slightly more stabled horses showed behaviour change after the fireworks display than turned out horses. Reports of stress-related behaviours in stabled horses were also higher than for turned out horses in ten out of eleven given categories.

Owners can only take steps to protect horses if they know fireworks are going to be let off. Of 3,481 survey respondents whose horse had been impacted by fireworks, more than 70% had been unaware that fireworks were due to be used close by. Awareness was more than twice as high for organised public displays than private displays. Owners value this information to help them prepare and be present to monitor their horse, but the data indicates that even with prior notice, the risks cannot always be significantly reduced and in all adverse outcome scenarios reported by respondents, between 13.7% and 22.3% had been aware that fireworks were due to be let off.

While not all horses show reactivity when fireworks are let off, there are many that do. The data shows that owners have limited ability to fully protect their horses from the risks fireworks present and there is widespread support for calls for tighter firework regulations. Horses are only one of many groups who experience adverse outcomes from firework displays. This report sheds light on some of the challenges around reducing harm within the current legislative framework.

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1. Fireworks and Horses survey

This online survey was conducted between 18th December 2024 and 19th January 2025. Respondents were required to be over 16, based in the UK and own or be responsible for at least one equine.

A total of 27 possible questions were asked using a range of question types to gather both quantitative and qualitative data. Some demographic information was requested to determine the geographical spread and age range of respondents. No personal information was requested.

The survey was distributed through Alchemer survey software under licence to Redwings Horse Sanctuary and promoted primarily through social media and other online tools. Just under £500 of Facebook advertising was used to increase the survey's reach and increase the number and type of responses received. A total of 5,128 complete responses were received and analysed using Microsoft Excel. Over 15,000 open text comments were received as part of the dataset.

The principal report sharing top-level survey findings was published in February 2025. It was shared with the Department of Business and Trade at a roundtable meeting that month in addition to being made available to the public and press.

1.1. Demographic data

Complete responses were received from adult horse owners of all ages and from across the whole of the UK. The majority of responses were from England, but the distribution of responses from each of the four UK countries was roughly proportionate to the populations of those countries, with slightly fewer responses from Scotland and Northern Ireland. The strict regulations around possession and use of fireworks in Northern Ireland may have affected the number of survey responses from that country. Geographical location of respondents is shown in Figure 1.

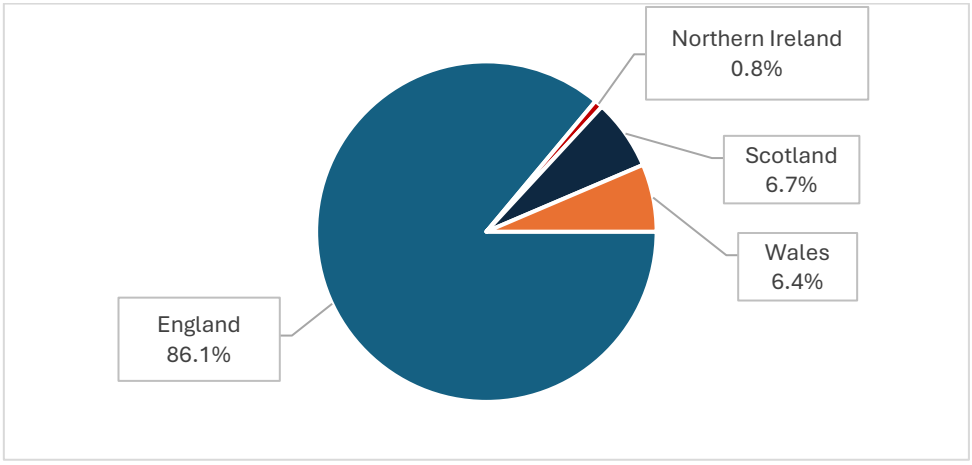

Figure 1. Resident location of survey respondents (n=5,128)

1.2. Survey limitations

The survey was self-selecting and there was no obligation on anyone to take part. As with all self-selecting surveys, this means there is likely to be a degree of respondent bias within the data as horse owners who have strong feelings about fireworks could be more motivated to participate. However, survey promotion actively promoted responses from owners with a wide range of experiences and perspectives.

As an equine welfare charity which actively campaigns on fireworks, Redwings' own position may have raised concerns about the objectivity of the research. It is important to note that any conflict of interest has been consciously addressed throughout the project by working with an independent research consultant at all stages.

However, the substantial number of responses achieved in a short space of time provides a large dataset and suggests the importance of this issue to many within the equestrian sector. It also means that subgroups of data within the survey also regularly achieve a high response rate, increasing confidence in the value of segmenting data for additional insights and drawing conclusions. Where findings within this report involve a relatively low number of responses, this is highlighted in the accompanying text.

1.3. Terminology

The word 'horse' is used in this report for ease, but the term is used to cover any domestic equine, including horses, ponies, donkeys and mules. Although horse is used in the singular, most survey respondents were responsible for more than one equine. Just over a quarter cared for one equine (27.6%), more than 30% cared for two (31.1%) with other respondents having responsibility for three or more equines.

The word 'owner' is used to describe those with horses in their direct care, though this also covers people with responsibility for their equine on a loan or share basis.

1.4. Acknowledgements

The survey, its analysis and the subsequent reporting documents would not have been possible without the support of independent research consultant Dr Georgina Crossman.

2. Horse behaviour

In evolutionary terms, equines are prey animals (a food source for predators) who survive by detecting and reacting to potential danger as quickly as possible. Despite several thousand years of domestication, horses remain hardwired to be alert and fearful; running first and asking questions later. As a result, today's horses' genetic makeup still provides them with:

- Highly attuned senses, including more than twice as many rod receptors in their eye providing excellent low-light vision; around 25 – 30 million olfactory (smell) receptors (compared to a human's 5 million); and a wider range of hearing than people (around 55 – 33,000 hertz for horses compared to 20 – 20,000 hertz for humans). The funnel shape of horses' ears also provides an acoustic gain of 10 – 20 decibels, meaning.[3]
- A highly efficient fear-response system, including the largest amygdala of any animal relative to body size (activation of the amygdala plays a key role in reaction and memory-creation during fearful situations).
- Athletic ability giving healthy horses speed, stamina and agility to put safe distance between themselves and a potential threat. Stress hormones such as adrenaline and cortisol boost energy levels, heart rate and respiration in the face of threat.

As a prey animal, horses have a strong herding instinct and derive a fundamental sense of safety from being within an established social group. The need to be close to companions is particularly strong in the face of a threat or uncertainty.

Horses also work collectively to monitor their environment, meaning if one horse responds to potential danger, other group members may also become hyper-alert and potentially anxious. A group may act as a calming influence on an anxious individual, but equally, one or two horses whose flight instinct is triggered can lead to the whole herd galloping in panic.

Horses are adaptable and able to learn, making them a valuable domestic companion. Copinig with environmental stressors is also part of their survival toolkit and training can help them to adapt their reaction to stressful stimuli. However, they also have excellent memories and memories associated with fear are deep-rooted and can affect reactions to similar situations in the future. These fearful associations cannot be 'unlearned'.

Like humans, all horses are individuals and their breed, history, circumstances and character all play a part in how they experience and react to what is happening around them and to them. Some horses don't appear to have been stressed by previous exposure to fireworks, but the data suggests that they can still become distressed during nearby displays. By understanding how horses have evolved, it is easier to appreciate the challenges faced by people trying to ensure these flight or fight animals are kept safe when fireworks are used.

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[3] Rørvang, M.V., Nelson, B.L. and McLean, A.N. Sensory Abilities of Horses and Their Importance for Equitation Science. *Frontiers in Veterinary Science. 7; 633.* doi: 10.3389/fvets.2020.00633. https://pmc.ncbi.nlm.nih.gov/articles/PMC7509108/

3. Fireworks in the UK

While Bonfire Night, Diwali and Chinese New Year remain traditional dates for using fireworks, displays are now commonly held throughout the year for occasions including New Year's Eve, weddings, festivals, concerts, birthdays and gender reveals.

The UK is reported to spend over £2 billion each year on fireworks [4] and the industry has been projected to grow by 4.6% between 2025 and 2034[5]. There are four categories of fireworks that are used in the UK:

- Category 1 fireworks are suitable for indoor use and include products such as sparklers and party poppers.
- Category 2 fireworks are for outdoor use and require a minimum distance of 8 metres between the launch site and spectators.
- Category 3 fireworks are for outdoor use and require a minimum distance of 15 metres between the launch site and spectators.
- Category 4 fireworks are for use by professional fireworks organisers only.

The maximum permitted noise level for fireworks available to the public (categories 1 – 3) is 120 decibels. There is no specified noise limit for Category 4 fireworks.

Only licensed retailers are permitted to sell fireworks throughout the year, including through online sales. Other retailers can offer fireworks to consumers from 15th October to 10th November and between 26th and 31st December to coincide with traditional calendar dates.

Categories 1 – 3 fireworks can be sold to and used by anyone over the age of 18. They can be let off any day between 7am and 11pm. On November 5th, Diwali and Chinese New Year the curfew is extended to midnight, and on New Year's Eve it is 1am. They must not be let off in public places such as parks or streets.

Regulations around the safety and sale of fireworks is retained by Westminster. Use of fireworks is a devolved matter and Scotland brought in its own legislation in 2022. Northern Ireland has had strict limitations on access to fireworks for many years, meaning only Category 1 fireworks are available to those without a valid licence.

There is a range of government guidance on the safe use of fireworks but recommendations are not legally enforceable. Advice provided on the UK government website states that: 'Fireworks must not be let off near livestock or horses in fields'. Unfortunately, there is no definition of what 'near' means.[6]

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[4] British Fireworks Association website https://www.britishfireworks.co.uk/news-features/253-playing-safe-with-fireworks accessed 11/08/2025

[5] Expert Market Research website https://www.expertmarketresearch.com/reports/united-kingdom-fireworks-market accessed 11/08/2025

[6] *Fireworks and Animals: How to keep your pets safe* available on the UK Government website https://assets.publishing.service.gov.uk/media/5a7c693de5274a5590059ae6/fireworks.pdf accessed 07/08/2025

4. Fireworks and horses

In view of their sensitive and fearful nature, it is unsurprising that horses can show signs of distress when exposed to many fireworks currently used legally in the UK. That distress can result in high-risk behaviour as the horse attempts to escape the source of fear, in some cases resulting in injury, illness or death to the horse or injury to a person.

Awareness of the danger fireworks can present to horses is often raised when tragic stories are shared in the press and on social media. However, data that helps to put these distressing cases into a wider context is currently limited. The F&H survey aimed to gather evidence to fill that gap by exploring a range of experiences when fireworks are let off close to horses.

4.1. Stress behaviours

Of the 5,128 respondents who completed the survey, more than two-thirds (67.9%) said they had experienced a horse in their care being negatively affected by fireworks.

Respondents were asked to indicate the behaviours seen in their horse by selecting from a checklist of common stress indicators. Respondents were offered one of two lists, adapted to reflect whether the horse was stabled at the time fireworks were let off or turned out in a paddock based on their answer to a previous question. Additional behaviours not listed could be submitted under the 'Other' option. The findings are shown in Figures 2 and 3.

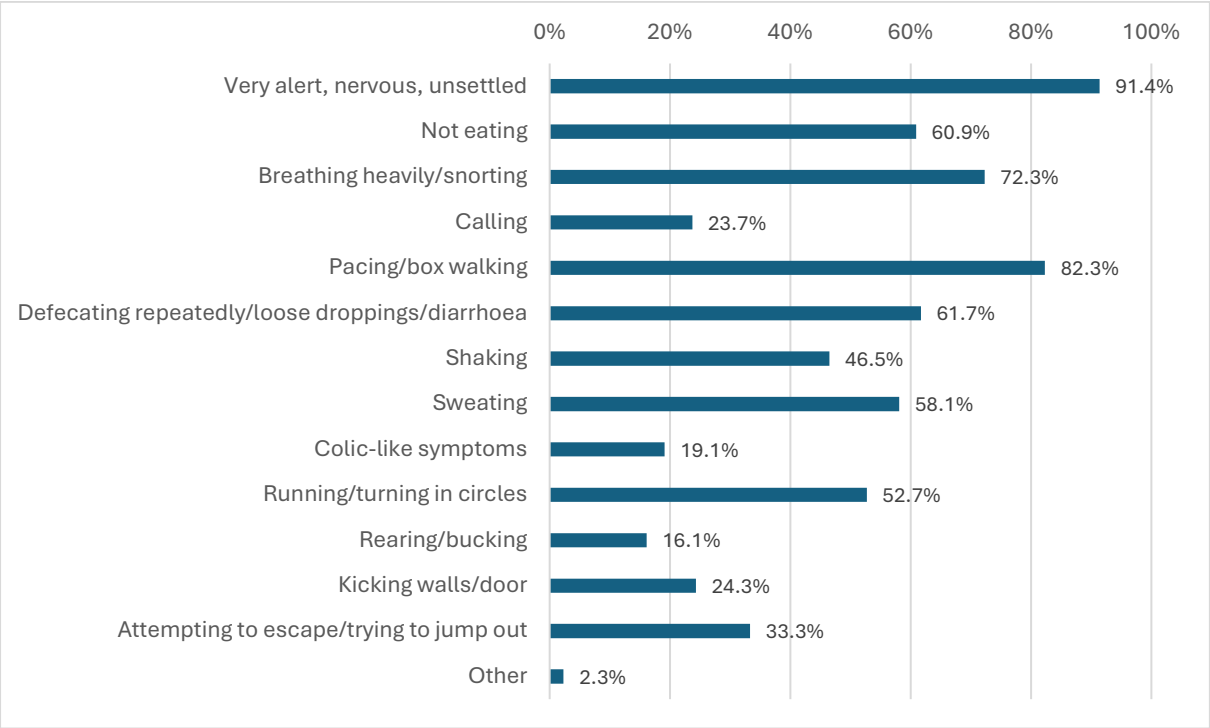

Figure 2. Behaviours observed in response to fireworks in stabled horses (n=1,750) (respondents could select more than one option)

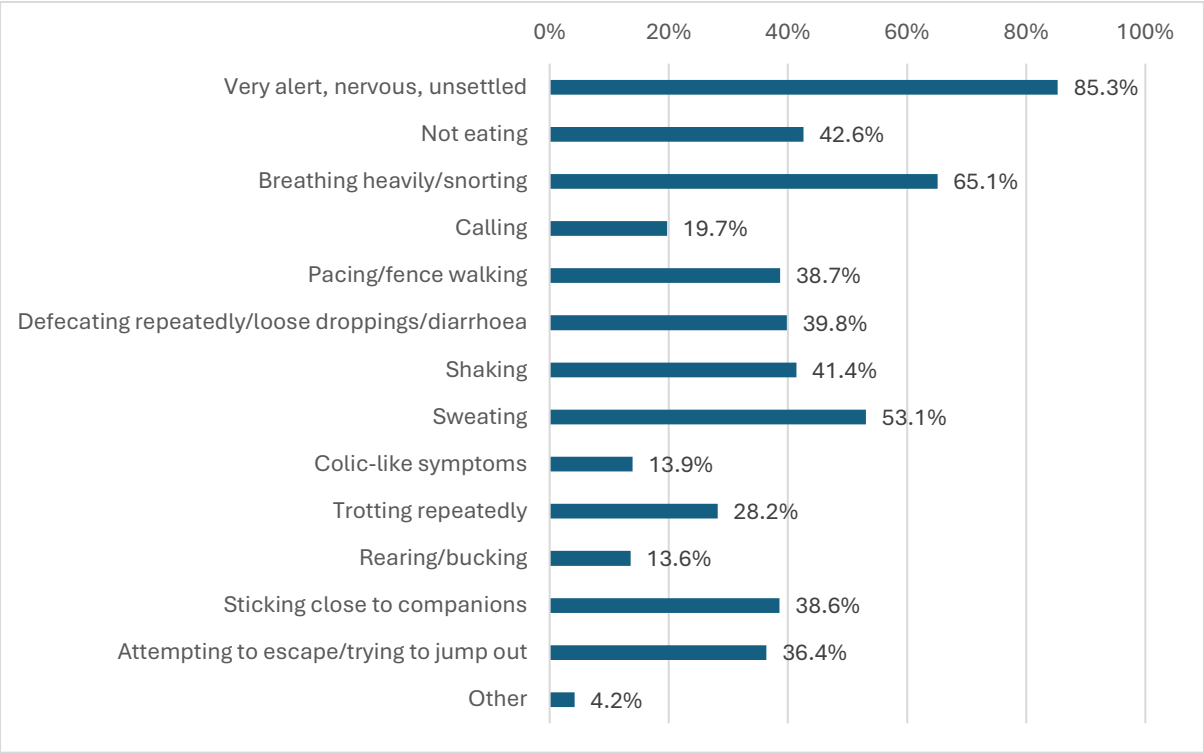

Figure 3. Behaviours observed in response to fireworks in turned out horses (n=1,730) (respondents could select more than one option)

These findings correlate with some existing data on the impact of fireworks on horses. A study of 4,765 New Zealand horse owners published in 2016 by Gronqvist et al. found that 79% of respondents described their horse as either 'anxious' (39%) around fireworks or 'very anxious' (40%). The remaining 21% felt their horse was 'not anxious' around fireworks.[7]

A survey of UK and US horse owners on noise anxiety in horses found that 22% of respondents had noted changes in behaviour in response to loud noises.[8] A study of Finnish and Swedish horse owners reported that 30% of Finnish respondents and 55% of Swedish respondents said their horse had shown signs of noise anxiety over New Year's Eve.[9]

In addition, 2,837 horse owners participated in an online survey in 2020. When asked how their horses/ponies were affected by fireworks, around 80% said their horses/ponies were affected, with around a third being affected slightly, just under 30% affected moderately and around 18% affected severely.[10]

[7] Gronqvist, G,. Roger, C., Gee, E. The Management of Horses During Fireworks in New Zealand, *Animals* (2016), 6(3),20. https://doi.org/10.3390/ani6030020

[8] Riva, M.G., Dai, F., Huhtinen, M., Minero, M., Barbieri, S., Dalla Costa, E. The Impact of Noise Anxiety on Behavior and Welfare of Horses from UK and US Owner's Perspective. *Animals* (2022), *12*, 1319. https://doi.org/10.3390/ani12101319

[9] Lindstedt, J.S.M. (2020) *Fireworks related equine noise anxiety in Finland and* Sweden (Master's thesis, Eesti Maaülikool). Available at https://dspace-test.emu.ee/server/api/core/bitstreams/c71de4f6-0926-4fb5-8222-05f0f449e2ea/content

[10] Marlin (2020) https://askanimalweb.com/fireworks-horses-a-survey-of-owners/ accessed 29/07/2025

4.2. Outcomes of stress behaviours

Of survey respondents with firsthand experience of a horse being distressed by fireworks, more than half reported change in the horse's behaviour that lasted beyond the display itself. Further outcomes included the horse becoming injured or ill, escaping, or having an existing health condition that was made worse. In almost 4% of cases the horse lost their life. In around 10% of cases a person was reported to have been injured due to a horse's reaction to fireworks. All findings are shown in Figure 4.

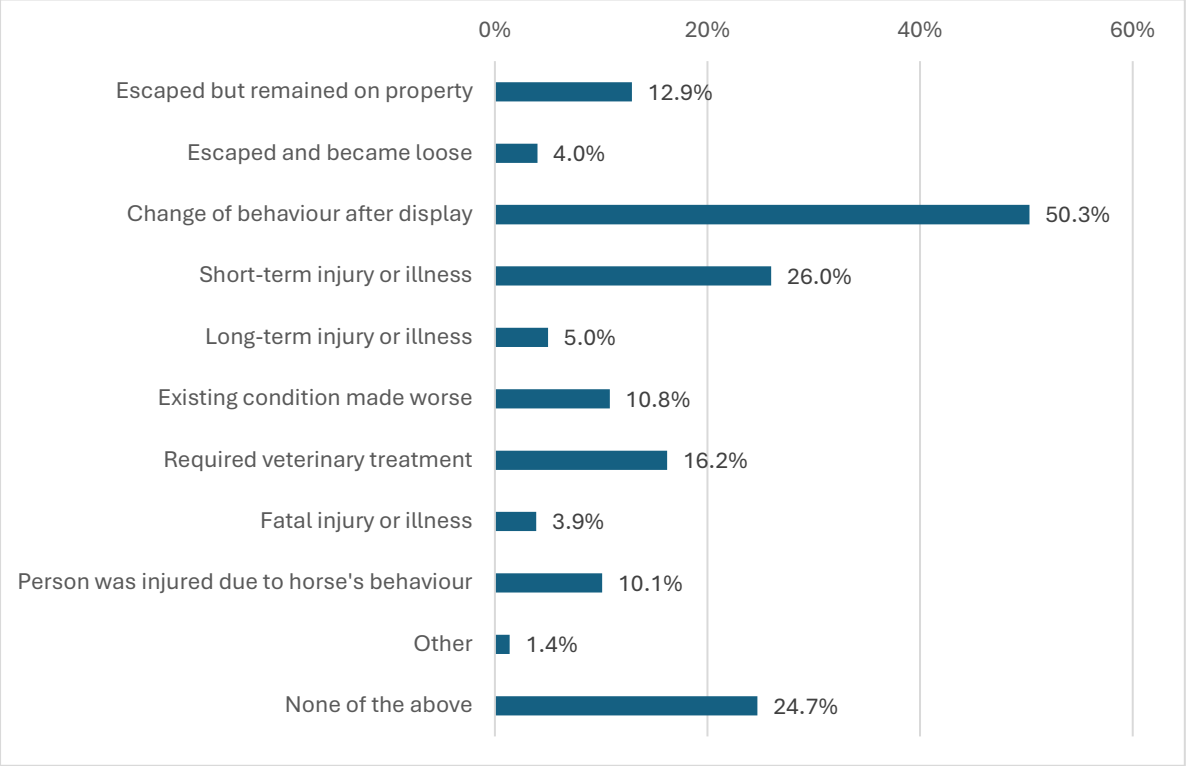

Figure 4. Outcomes resulting from horses becoming distressed by fireworks (n=3,483) (respondents could select more than one option)

In 2016, Gronqvist et al. found that of 1,107 owners whose horses had been affected by fireworks in New Zealand, 35% of horses had broken through fences as a result and 26% had sustained injuries including lacerations, strains/sprains and broken limbs[11].

Research carried out by the British Veterinary Association in 2018 suggests horses are more likely than other pets to suffer injury or illness due to fireworks. A survey of their members found that almost one in five equine vets (19%) reported attending patients with fireworks-related injuries in the previous year. This compared to one in 14 small animal vets.[12]

[11] Gronqvist G, Roger C, Gee E. The Management of Horses During Fireworks in New Zealand, *Animals* (2016), 6(3),20; https://doi.org/10.3390/ani6030020

[12] British Veterinary Association website https://www.bva.co.uk/news-and-blog/news-article/fireworks-season-sparks-vet-calls-for-pet-safety/ accessed 11/08/2025

An additional Redwings questionnaire completed by 15 equine and mixed veterinary practices in 2024 found that during the two weeks around Bonfire Night, more than half (53.3%) treated horses following an incident resulting from fireworks being let off.[13]

4.3. Human impact

In around 10% of cases where respondents experienced their horse being adversely affected by fireworks, a human was also injured during the incident (see Figure 3).

In addition to the physical risk to people, the potential impact of fireworks on horses may have a number of other consequences on those who look after them in terms of time, cost and anxiety.

> "Although my horses seem ok, I do get very anxious about fireworks. You never know what might happen."

Awareness of the risks fireworks present means some owners who haven't dealt with fireworks-related stress in their own horse still worry about the issue. Over 87% of all survey respondents said they worry about the potential impact of fireworks. When grouping levels of concern by those having experienced a horse in their care being affected by fireworks compared to those without firsthand experience, the data shows that more than two thirds of those who have not dealt with the impact of fireworks still worry about the potential for their horse to be affected, with almost 45% worrying 'a lot' as shown in Figure 5.

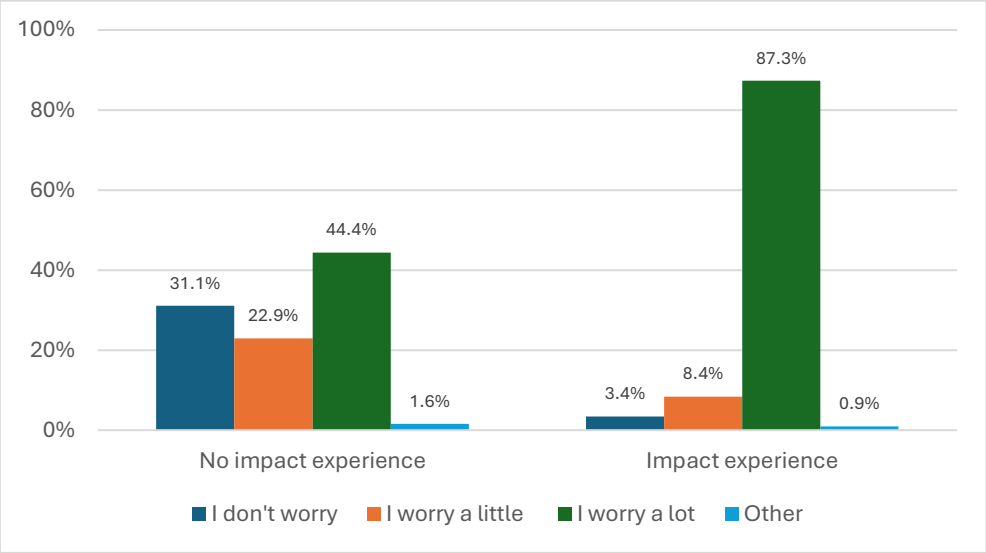

Figure 5. Feelings about fireworks grouped by experience of a horse being impacted (n=5,128)

[13] Redwings Horse Sanctuary (2025) *The impact of fireworks on veterinary practices and their clients.* https://www.redwings.org.uk/news-and-features/XLVetssurvey

5. Protecting horses from fireworks

The survey findings suggest that most owners try to protect horses from fireworks. Three-quarters of respondents said they take steps to minimise the risks. Those respondents were asked to choose from a list of common protective measures to indicate the steps they use. Findings are shown in figure 6.

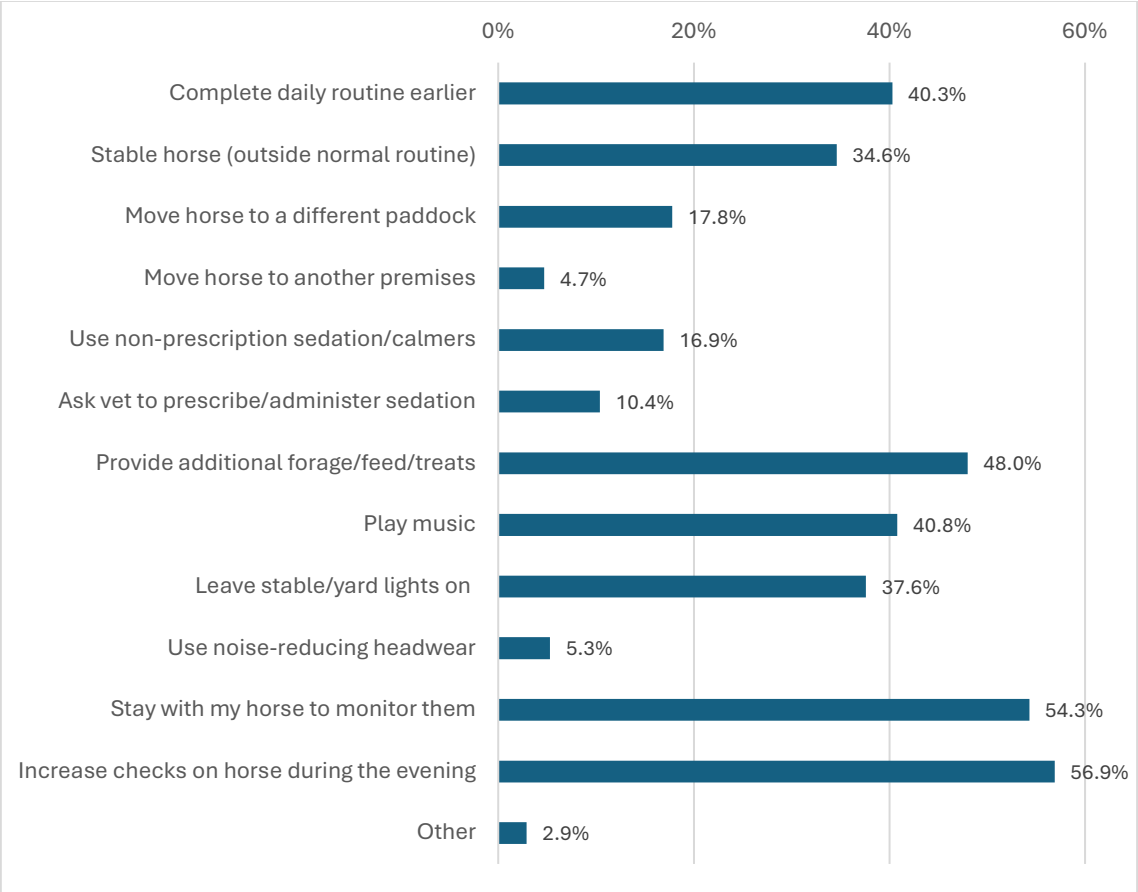

Figure 6. Steps taken to protect horses from fireworks (n=4,000)
(respondents could select more than one option)

It's important to note that owners may also have other considerations around fireworks in addition to concern over their horse's wellbeing, such as children or pets who can also be affected or professional commitments.

"I used to stay with [the horses] but need to be with my dog in the house"

"My youngest child and my dogs are also terrified by them"

"I have to cancel work or pay someone to be here"

5.1. Effectiveness of protective steps

When asked to evaluate the overall effectiveness of steps taken to reduce the risk of fireworks impacting their horses, respondents' feelings varied. More than three-quarters felt their actions were 'moderately' or 'slightly effective', around one in ten said they were 'very effective' and a further one in ten felt the steps they took were 'not effective'. Findings are shown in Figure 7.

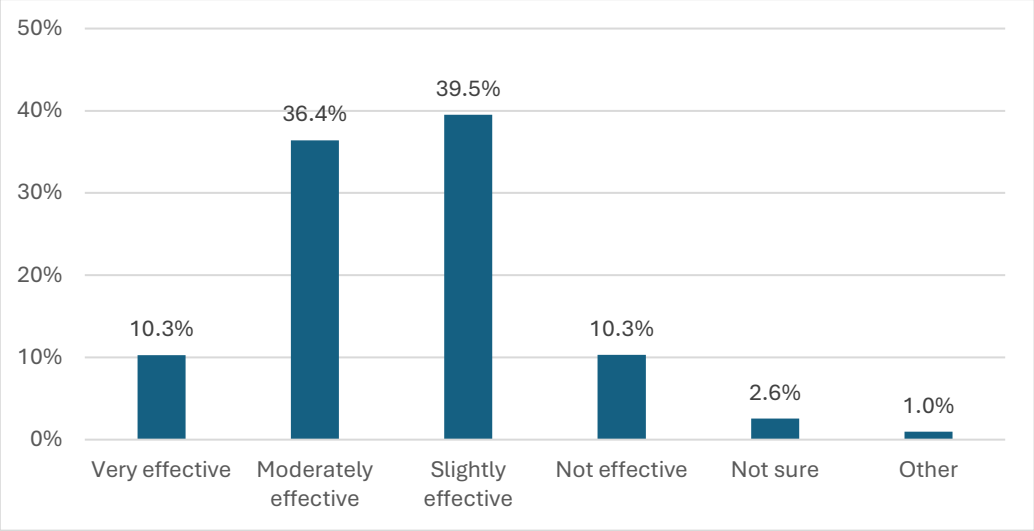

Figure 7. Evaluated effectiveness of steps taken to protect horses from fireworks (n=3,992)

A short online survey of horse owners carried out in 2020 also asked about the measures taken to protect horses from fireworks and their effectiveness. The options considered were stabling or turning out the horse, using calmers or sedation, playing music, using ear bonnets or ear plugs and moving the horse away. The conclusion was that 'None of the common approaches listed were considered particularly effective'.[14]

5.2. Stable or paddock?

One of the main decisions owners tend to make when they know fireworks are planned is where the horse is likely to be safest.

Advice is often to contain horses by stabling them ahead of firework displays to reduce the risk of illness, injury or escape following activation of their flight instinct. For example:

'Horses often bolt from firework noise and become injured. Always make sure horses, ponies and donkeys are stabled while fireworks are being let off. Make sure fireworks are not in view by closing the stable door.'[15]

[14] Marlin (2020) https://askanimalweb.com/fireworks-horses-a-survey-of-owners/ accessed 29/07/2025
[15] British Fireworks Association website accessed 11/08/2025 https://www.britishfireworks.co.uk/the-british-firework-championships/advice-for-pet-owners

However, guidance from equine specialists often takes a more nuanced approach based on individual circumstances to try and avoid draining a horse's tolerance to stress through sudden changes of routine and/or environment, which may reduce their ability to cope with additional sources of anxiety such as fireworks.[16]

The data sheds light on the risks faced by both stabled horses and those that are turned out when exposed to fireworks. Of the 3,483 survey respondents whose horses had been directly affected by fireworks, around one half (50.2%) were in a stable and the other half (49.7%) were turned out at the time. The remaining 0.1% weren't sure.

Of the 78.0% of survey respondents who took steps to protect their horse, over a third (34.6%) stabled their horse in a change from their usual routine. Some comments submitted through the survey are indicative of the challenge owners can feel around where to locate their horse during fireworks.

> "Trying to decide if horses are safer inside or outside during the fireworks main seasons"
>
> "Turn horses out that are usually stabled as they panicked more inside"
>
> "Keep all our horses and 3 cats in… help keep them safe"

Concern around making the right decision for horses can also be seen in online discussions[17]

5.1.1. Horses' response to fireworks by location

The data on horse behaviours observed in response to fireworks (see Figures 2 and 3) was collated so that behaviours that may have affected either stabled or turned-out horses could be compared by location. This meant behaviours such as galloping in a paddock or kicking stable walls were excluded. Figure 8 shows what proportion of horses displaying comparable behaviours were stabled compared to those who were turned out.

A higher proportion of stabled horses were reported as exhibiting each behaviour other than those trying to escape, which was seen more slightly more frequently in horses that were turned out. The greatest proportionate difference was in pacing, with more than two-thirds seen box walking in their stable compared to less than a third seen fence walking in their paddock. Horses in stables were more commonly noted as defecating repeatedly and/or having loose droppings or diarrhoea.

[16] For example, the Blue Cross website at https://www.bluecross.org.uk/advice/horse/horses-and-fireworks accessed 15/08/2025

[17] For example, the Horse and Hound discussion forum at https://forums.horseandhound.co.uk/threads/fireworks-horses-in-or-out.823029/ accessed 15/08/2025

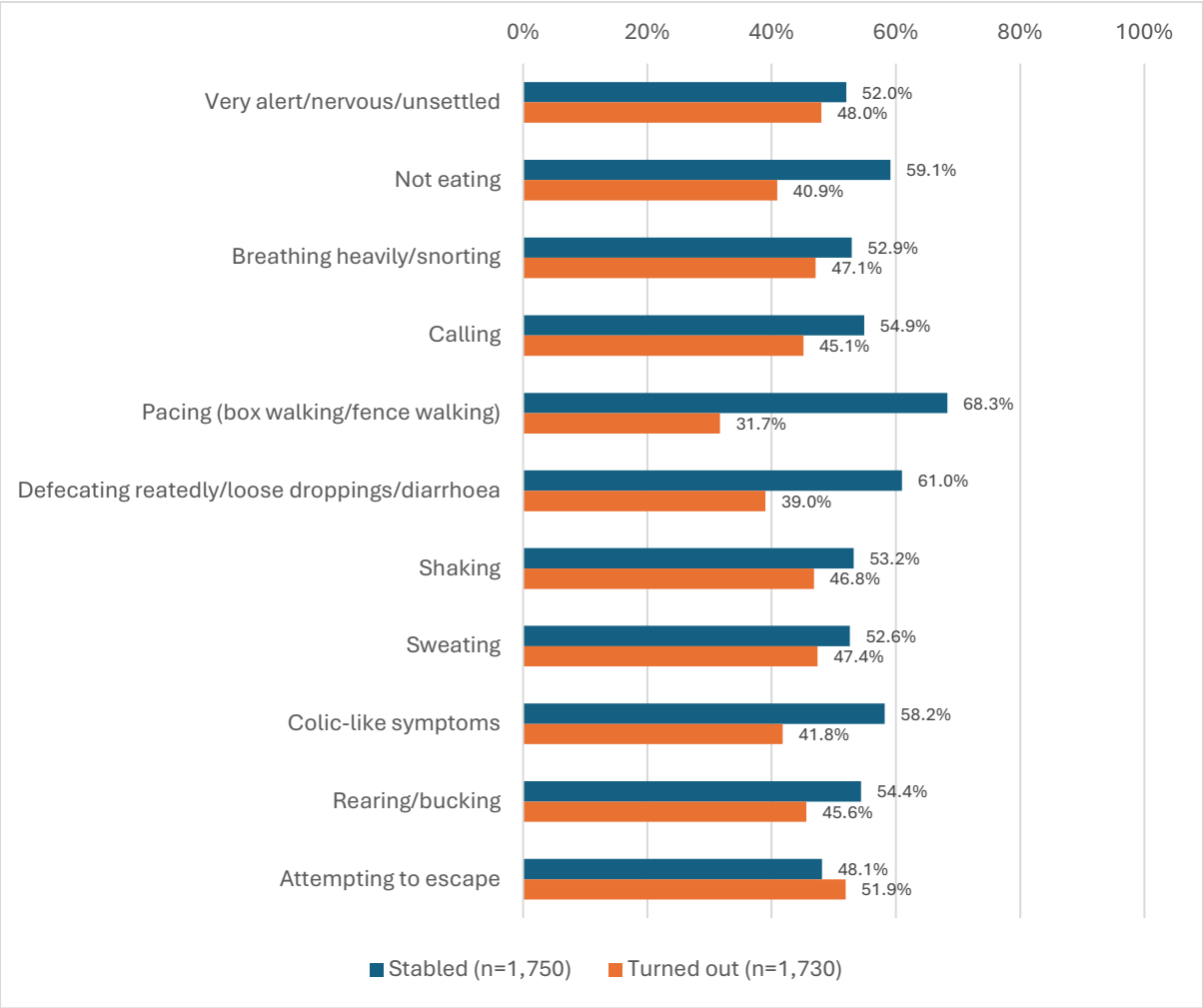

Figure 8. Horse behaviours in response to fireworks grouped by location (n=3,480) (respondents could select more than one option from the behaviour checklist)

N.B. It is important to note that not all owners would have been with their horse at the time fireworks were being let off (for example, those using shared facilities such as livery yards) and that some signs of distress could be more difficult to notice in a horse in a dark paddock than a stable.

5.1.2. Outcomes of stress behaviours grouped by location

Data on the more serious outcomes resulting from nearby fireworks was divided into two groups depending on whether the horse was stabled or turned out at the time of the display.

In most cases, fewer stabled horses were involved in all the outcomes than those who were turned out, though there was a slight increase in stabled horses showed changes in behaviour that lasted beyond the fireworks display itself and stabled horses that had an existing condition noted to be worse after the fireworks. It is also notable that more human injuries were reported in relation to horses that were stabled.

The biggest proportionate difference was in escaping horses, with less than a third escaping from a stable compared to a paddock. Findings are shown in Figure 9.

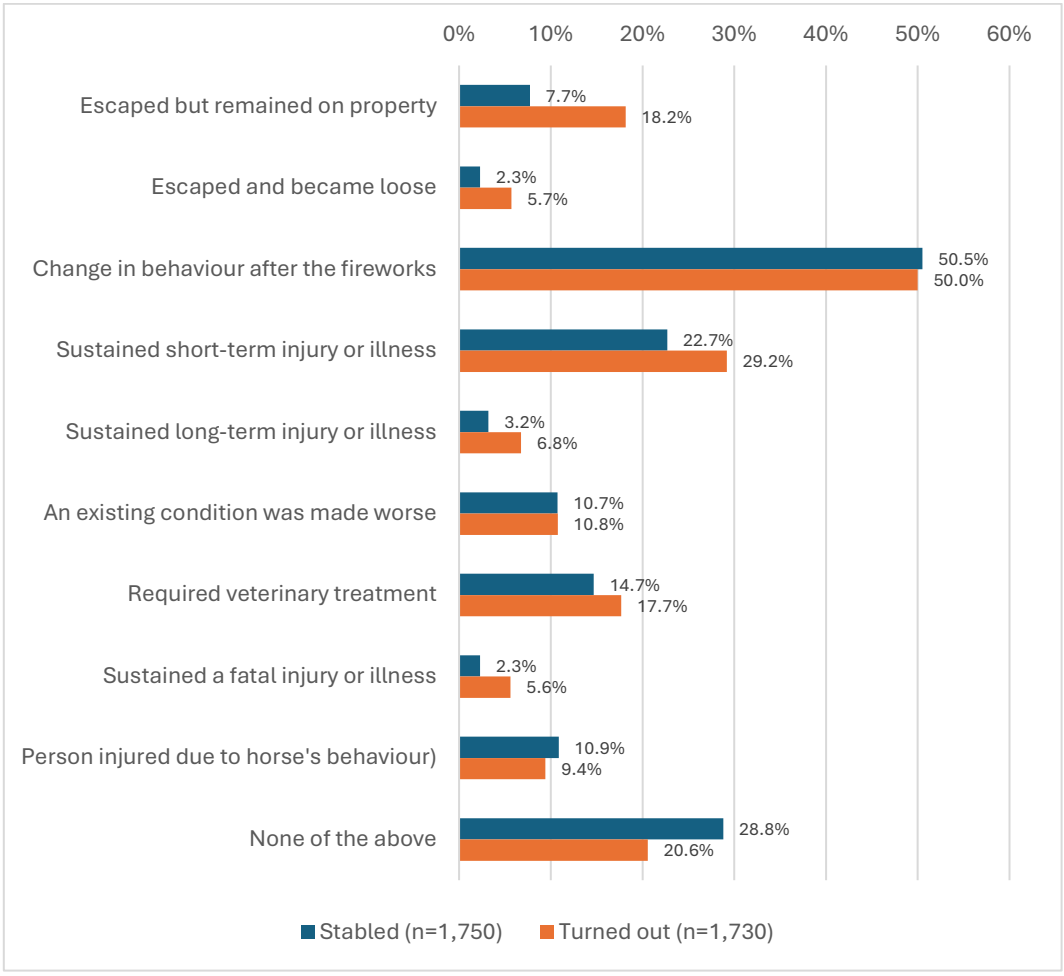

Figure 9. Outcomes of negative response to fireworks grouped by location at the time (n=3,480) (respondents could select more than one option from the outcomes list)

Overall, the data indicates that stabling horses may reduce but not eliminate the possibility of a serious outcome such as injury or illness. However, findings suggest that stabling may not reduce the distress experienced by the horse during fireworks.

6. Sedatives and calmers – an overview

Chemical products that inhibit a horses' physical reactivity can be used when fireworks are due to be let off. However, anything that interferes with normal physical and psychological function should considered carefully. Prescription sedatives are stronger and need to be discussed with a veterinary surgeon. They are not suitable for frequent use.

Non-prescription calmers designed to enhance relaxation in horses can be bought without prescription, though they are unlikely to reduce more than low-level anxiety. Some prescription drugs, such as ACP (acetylpromazine), also have a calming rather than sedative

effect. There has been limited research into the use of calmers but, as veterinary drugs, prescription sedation is subject to greater scrutiny and regulation.

Sedative drugs have a more profound effect on a horse's neural pathways leading to reduced mobility and behavioural expression so are only available on prescription. Gels or tablets can be given to the horse when appropriate by the owner, while an intravenous sedative that acts more quickly can only be administered by a vet. Considerations include:

- Products will generally reduce the horse's mobility rather than their perception. This means they may fully experience the fireworks display and potentially feel distressed but be unable to react physically. Inhibiting behaviour can help prevent injury but may potentially increase psychological distress and could contribute to longer-term negative associations with fireworks.
- Sedatives need to be given so they take effect before the fireworks start, but don't wear off before the display ends. A product such as Domosedan may last for 3-4 hours but should not be readministered once the effects subside.
- Use of sedatives needing veterinary administration often involve an out-of-hours visit in addition to the cost of the drugs. The bill could be around £150 - £200 or more.
- Prescription drugs usually require the horse to be stabled without food while they are sedated. This can disrupt their natural routine and behaviour and may mean loss of a positive distraction during fireworks, potentially increasing the horse's stress.
- Most prescription sedatives reduce gut motility, increasing the risk of colic. For this reason, products should not be over-used and plenty of drinking water needs to be available as the horse's body works to clear the drug.

Calmers and sedatives both come at a price. Prescription of a sedative such as Domosedan Gel involves the cost of a vet visit and the drug (usually over £30 a tube). The owner can administer the drug at an appropriate time but using this approach can only be achieved with prior knowledge of when fireworks will be let off.

6.1. Sedation and calmers' effectiveness

Of the survey respondents who took steps to protect horses from fireworks, just under 17% used non-prescription calmers and just over 10% used prescription sedatives (see Figure 6).

Responses to the question 'How effective do you feel the steps you take are in protecting your horse from fireworks?' was segmented by those who used prescription sedation and those who used non-prescription calmers and compared with those who didn't use these options.

It is important to note that respondents could select more than one option from the given list and most owners took multiple steps to protect their horse. As a result, the segmented

data includes owners who used calmers or sedation alongside other measures, meaning the evaluation was not always solely reflective of these products.

The data suggests sedation may not always achieve the desired effectiveness. Fewer respondents who had used prescription sedation or calmers felt the steps they took were 'Very effective' compared to those who didn't use them. There was also an increase in those who selected 'Not effective' in both groups. Results are shown in Figures 10 and 11.

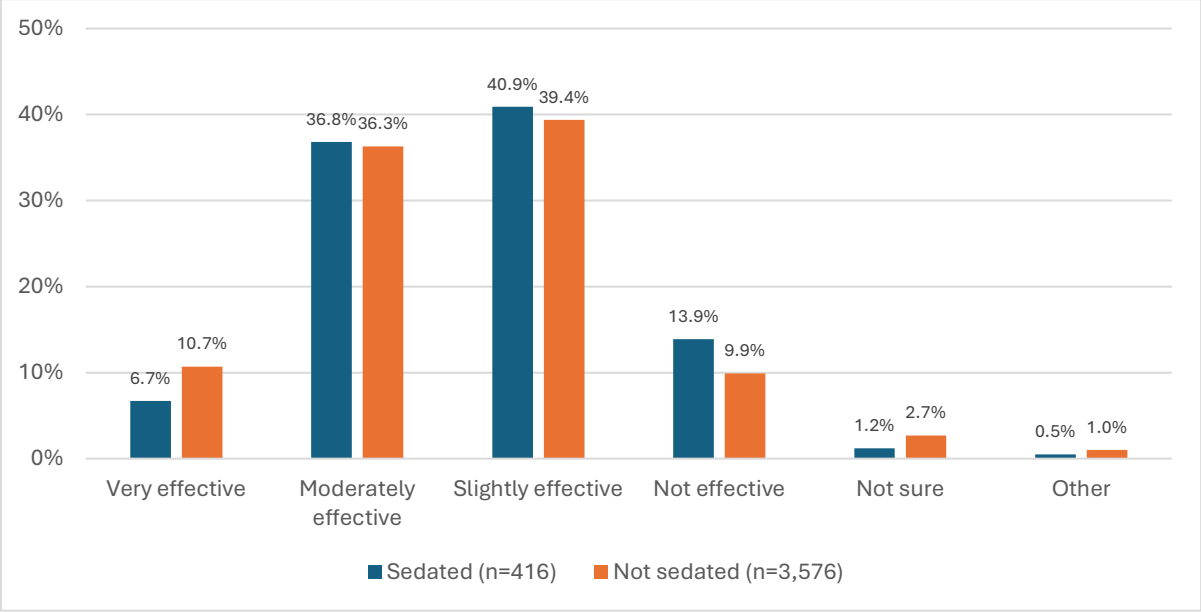

Figure 10. Effectiveness of steps taken to protect horses from fireworks grouped by respondents who used prescription sedation and those who didn't (n=3,992)

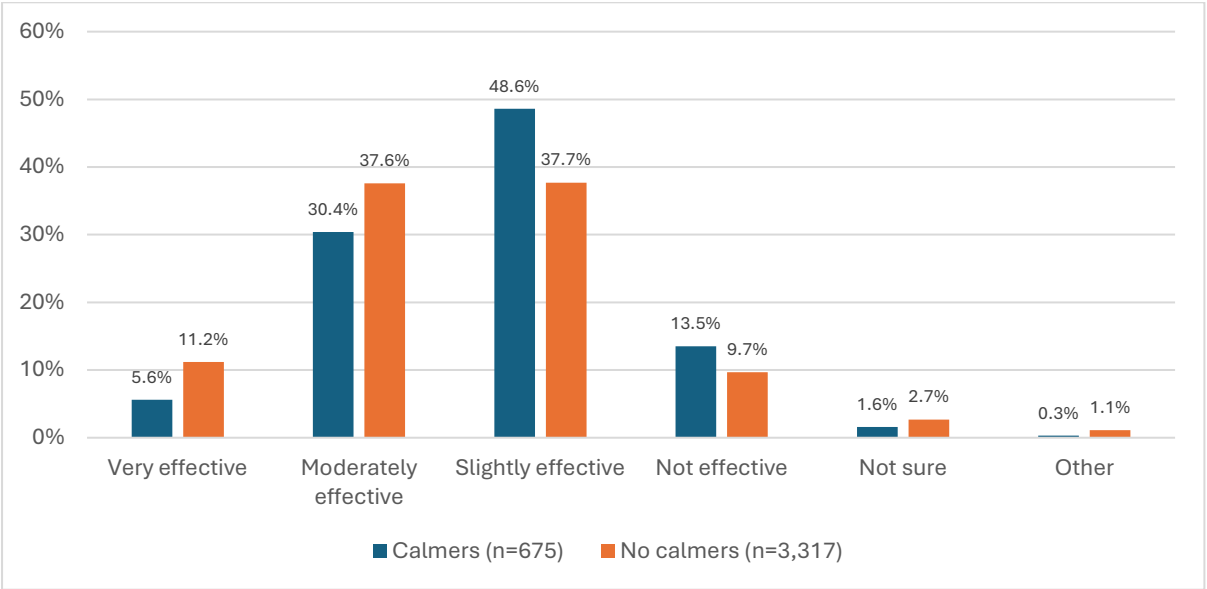

Figure 11. Effectiveness of measures to protect horses from fireworks grouped by those who used non-prescription calmers and those who didn't use (n=3,679)

Evaluating any preventative action can be difficult because it isn't possible to know exactly how the horse would have behaved on particular occasion had the action(s) not been taken.

Expectation of effectiveness of calmers and sedation products may also be higher due to there being additional planning and cost involved.

Findings from a short survey of 2,837 horse owners carried out in 2020 also gathered data about the steps they had taken to protect their horses from fireworks. Within that study, 32% had tried calmers and 13% had tried sedatives supplied by a vet. Evaluation was also varied, with more people reporting both calmers and sedation to be 'Not effective' than 'Very effective'. Calmers received fewer favourable reviews with only 3% finding them 'Very effective', compared to 15% giving sedation the same rating. Half of those who had used calmers judged them to be 'Not effective'

7. Firework triggers

To help protect horses most effectively, it is helpful to understand what they need protecting from. Fireworks involve a range of sensory experiences, most noticeably visual and auditory, but there is often also an olfactory component, particularly for an animal species that has a more advanced sense of smell than humans. There can also be a concern around the physical presence of falling sparks from nearby fireworks and debris from spent casings.

The survey asked owners who worried about the potential impact of fireworks which elements they were most concerned about as a risk to their horse. Loud bangs were the biggest concern, with almost 95% selecting this option, followed by other noises such as crackles and whistles. All results are shown in Figure 12.

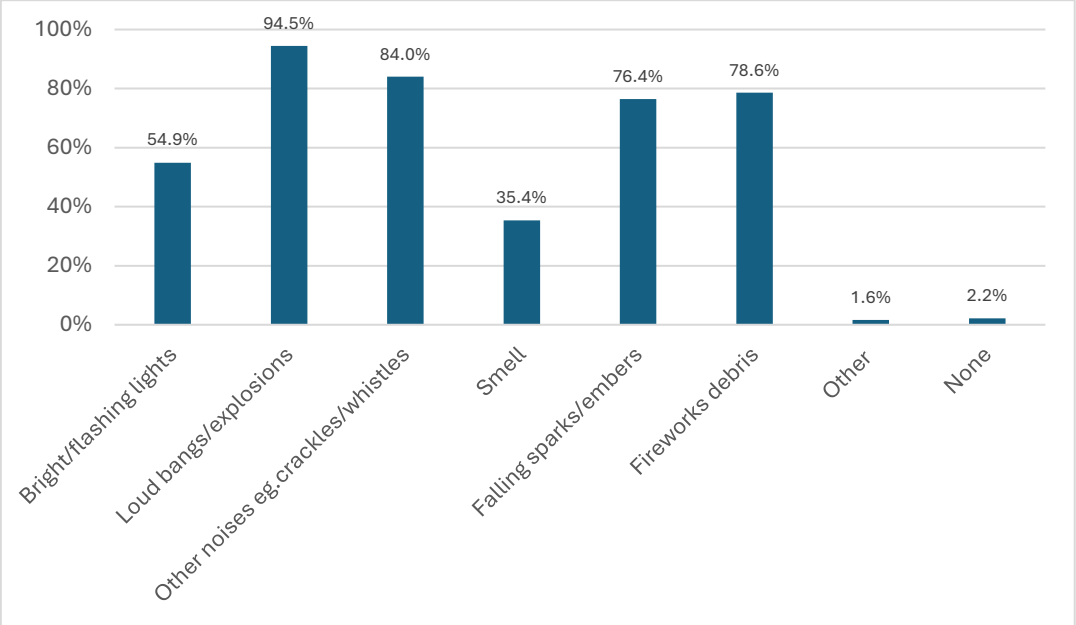

Figure 12. Which, if any, elements of firework devices do you feel could impact your horse? (n=4,468) (respondents could select more than one option)

NB. Respondent concerns around sparks and embers and firework debris is likely to reflect anxiety around fire risks and the danger of debris rather than impact on horse behaviour.

The suggestion that noise is the biggest stressor for horses during fireworks displays is borne out by other evidence. A research paper by Riva and colleagues published in 2022 noted that: 'Compared to visual and olfactory stimuli, unexpected unknown noises seem to elicit rapid flight reactions more frequently'.[18]

The same paper also states that: 'The response of animals to a certain noise is determined not only by sound intensity, loudness, frequency, duration and pattern, but also by the animal's previous experience and the acoustic stimulus predictability.' This highlights the diversity of individual horses' ability to cope with fireworks and reflects the challenge presented by the variety and unpredictability of displays.

There is evidence that even horses who have shown little reaction to fireworks in the past may find that if displays are closer, louder, longer or more frequent, their tolerance threshold is reached. An individual's capacity to cope is also affected by their overall stress levels at the time. Other factors affecting a horse's sense of safety and wellbeing can be many and varied, including sleep deprivation (quite possible if fireworks have also occurred on previous days), ill health, moving home, change in companions (arrival of a new companion, loss of an existing one), change of routine or other recent stressful events such as veterinary interventions or travel.

By seeing tolerance as a spectrum, we can support horses to increase their ability to tolerate the multiple sensory factors involved in fireworks while acknowledging that every individual has the potential to reach a point where they can no longer cope and their behaviour changes accordingly.

7.1. Low-noise fireworks

While it is not possible to manufacture 'silent' fireworks due to the process involved in launching or propelling the device when ignited, many products are available that reach a lower noise threshold than those that involve a loud, explosive bang.

The maximum noise limit for all fireworks accessible to the public is currently 120 decibels and professional fireworks may achieve noise levels of up to 175 decibels. Low-noise options usually create sounds of between 70 and 90 decibels.[19]It's important to remember that horses can hear across a wider acoustic range than humans, but sounds can also be 10 – 20 decibels louder to horses due to the shape of their ears (see page 8).[20]

[18] Riva, M., Dai, F., Huhtinen, M,. Minero, M., Barbieri, S., Dalla Costa, E. The Impact of Noise Anxiety on Behavior and Welfare of Horses from UK and US Owners' Perspective *Animals* **2022**, *12*(10), 1319; **https://doi.org/10.3390/ani12101319**

[19] Fireworks Kingdom website https://fireworkskingdom.co.uk/a/blog/post/what-are-silent-fireworks#:~:text=Fireworks%20for%20children%20or%20older,Fountain%20fireworks accessed 14/08/2025

[20] Rørvang, M.V., Nelson, B.L. and McLean, A.N. Sensory Abilities of Horses and Their Importance for Equitation Science. *Frontiers in Veterinary Science. 7; 633.* doi: 10.3389/fvets.2020.00633. https://pmc.ncbi.nlm.nih.gov/articles/PMC7509108/

When asked whether more use of low-noise fireworks would benefit horse welfare, more than 90% of respondents agreed that it would, with more than 62% strongly agreeing as shown in Figure 13.

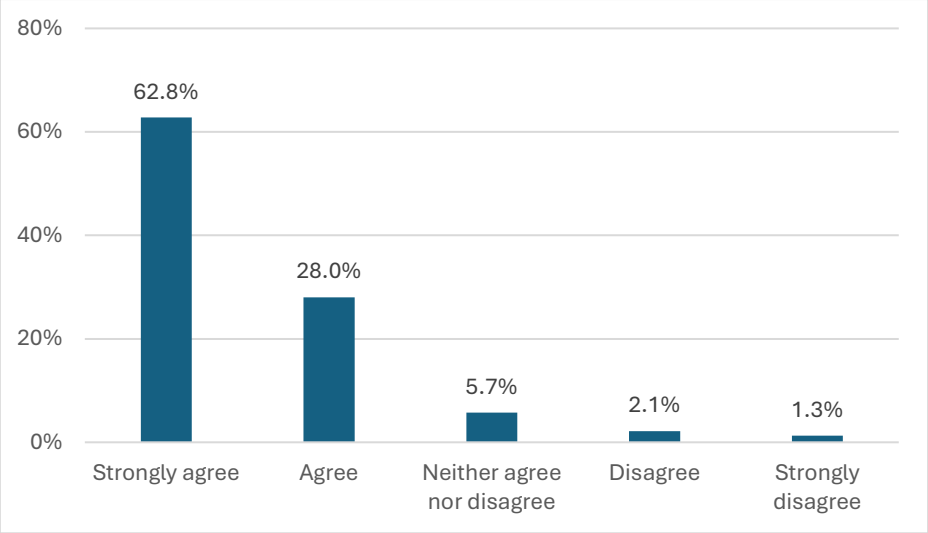

Fig. 13. To what extent do you agree or disagree that more use of low-noise fireworks would benefit horse welfare? (n=5,128)

> "…displays near to horses should be low noise or have a light or drone show instead there are so many other options available these days"

8. Noise-reducing headwear

Products are available that are designed to act as a barrier to sound waves entering a horse's ear. These may take the form of ear bonnets worn over the ear or plugs inserted into the ear. Noise-reducing (also called noise-dampening) accessories are often used at equestrian events and other busy environments to help avoid the horse becoming distracted or overstimulated.

Just over 5% of survey respondents had used noise-reducing headwear in an effort to protect their horse from fireworks, making the sample smaller than most other measures taken by owners, though still consisting of more than 200 horse owners.

It is important to note that respondents could select more than one option from the given list and most owners took multiple steps to protect their horse. As a result, the segmented data includes owners who used noise-reducing headwear alongside other measures, meaning the evaluation was not always solely reflective of these products.

Fewer respondents felt the steps they took to protect their horse were 'Very effective' or 'Moderately effective' when using noise-reducing headwear compared to those who didn't

use noise-reducing headwear. However, there was an increase in respondents using noise-reducing headwear who felt the steps they took were 'Slightly effective' and in those reporting the steps they took were 'Not effective'. All results are shown in Figure 14.

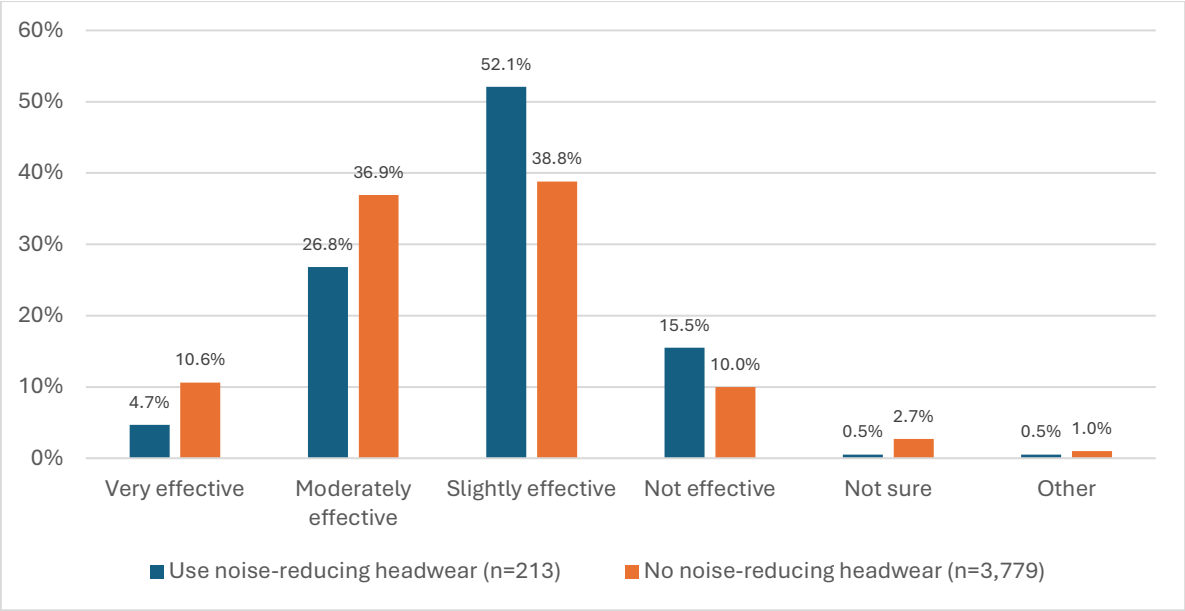

Figure 14. Effectiveness of measures to protect horses from fireworks grouped by those who used noise-reducing headwear and those who didn't (n=3,992)

Research published in 2023 looked at the effect of noise-dampening ear covers on horses' physiological and behavioural responses to a range of auditory stimuli. The researchers found that ear covers did affect horses' responses to a range of stimuli, though the research focus was on more ambient environmental noise such as music, applause and vocalisation of other equines.[21]

The mechanism of blocking an oral stimulus to avoid triggering stress could have some ethical advantages over inhibiting a horse experiencing stress but being unable to perform natural behaviours in response. However, there are also questions around secondary stress that may be caused by significant compromise of a key sensory perception mechanism in an animal whose sense of safety relies on environmental awareness and monitoring.

Specific research into the effectiveness of noise-reducing accessories such as ear plugs on protecting horses from acute loud-noise incidents such as fireworks would therefore provide valuable insight in this important area.

[21] Hole, C., Murray, R., Marlin, D., Freeman, P. Equine Behavioural and Physiological Responses to Auditory Stimuli in the Presence and Absence of Noise-Dampening Ear Covers. *Animals* ***2023****, 13*(9), 1574 https://doi.org/10.3390/ani13091574

9. Desensitisation

Helping horses to feel comfortable with certain stimuli that may naturally trigger anxiety can be approached using a process known as 'desensitisation'. This involves gradual, managed exposure to the specific environment, object or experience, often in combination with positive incentives designed to counteract negative reactions and create more neutral or even pleasurable associations with the same stimulus in the future.

The survey didn't assess horse owners' use of or feelings about desensitisation, but comments revealed that some respondents felt this can be an effective strategy.

> "All our horses are used to loud bangs, noises and flashing lights. Owners need to start taking responsibility and working with their horses to prepare them for that 'random' firework display"
>
> "I am very lucky that I am rural and the villages either side have shoots. This means my neds are very chilled usually, but I do worry…"

Investigation into the effectiveness of desensitising horses to fireworks would provide valuable insight into options owners may have to keeping their horses safe during displays.

10. Awareness of displays

People can also only take steps to protect horses when they know fireworks are going to be let off. Use of fireworks may be an assumption on key dates such as Bonfire Night, but even then, without specific details, owners may not be able to put measures in place at the right time.

Of the survey respondents who had experience of a horse being affected by fireworks, more than 70% had been unaware that a display was planned, as shown in Figure 14.

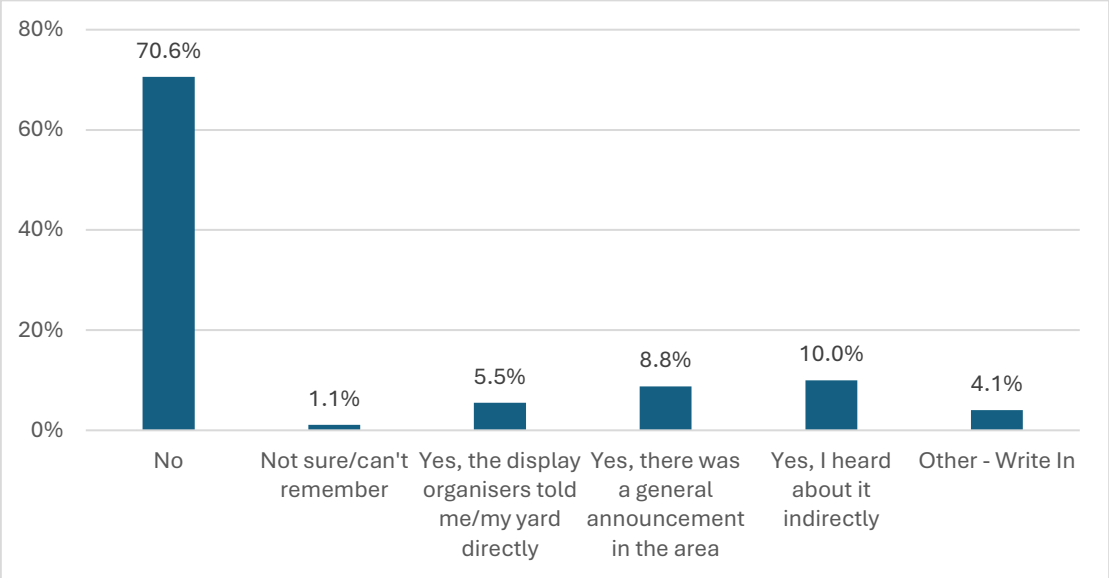

Figure 15. Were you aware that fireworks were going to be let off close to your horse? (n=3,481)

The low rate of communication around private fireworks displays is consistent with other sources. Unpublished data from the British Horse Society's incident reporting scheme shows that of 1,150 reports of incidents where horses were affected by fireworks, almost three-quarters (73.8%) had not been warned that fireworks were due to be let off, compared to one in five being made aware (21.0%).[22]

10.1. Benefits of awareness

It is understandable that horse owners want to know when fireworks will be let off close to their horse and given enough notice to take preventative action, if they're able to, or at least be able to monitor their horse and address any issues that arise.

A reasonable amount of notice is needed and accurate timings provided so that if an owner feels use of a calmer or prescribed sedation is needed, they are able to arrange this. It can also give an owner time to move horses to different paddocks or rearrange commitments of their own to enable them to put measures in place and be present as fireworks are let off.

> "If you don't know they are happening then you can't prepare"
>
> "…dependant on having enough warning to access sedation etc"

10.2. Limitations of awareness

However, even when an owner is made aware of a planned display and has the opportunity to take preventative measures, the data suggests that ability to fully protect horses is limited. Of survey respondents who reported more serious outcomes when their horse was affected by fireworks, at least 13% had prior warning of the display in each category as shown in Figure 16.

More than one in five owners who were aware of the fireworks saw changes in behaviour that outlasted the display. In 13.7% of cases the horse escaped and became loose, and 15.6% a long-term injury or illness. In 26 cases (19%) the horse died even though the owner had been aware that fireworks would be set off.

[22] British Horse Society incidents recorded through their website and Horsel app: https://www.bhs.org.uk/go-riding-and-learn/record-an-incident/ Data shared through personal email on 01/08/25

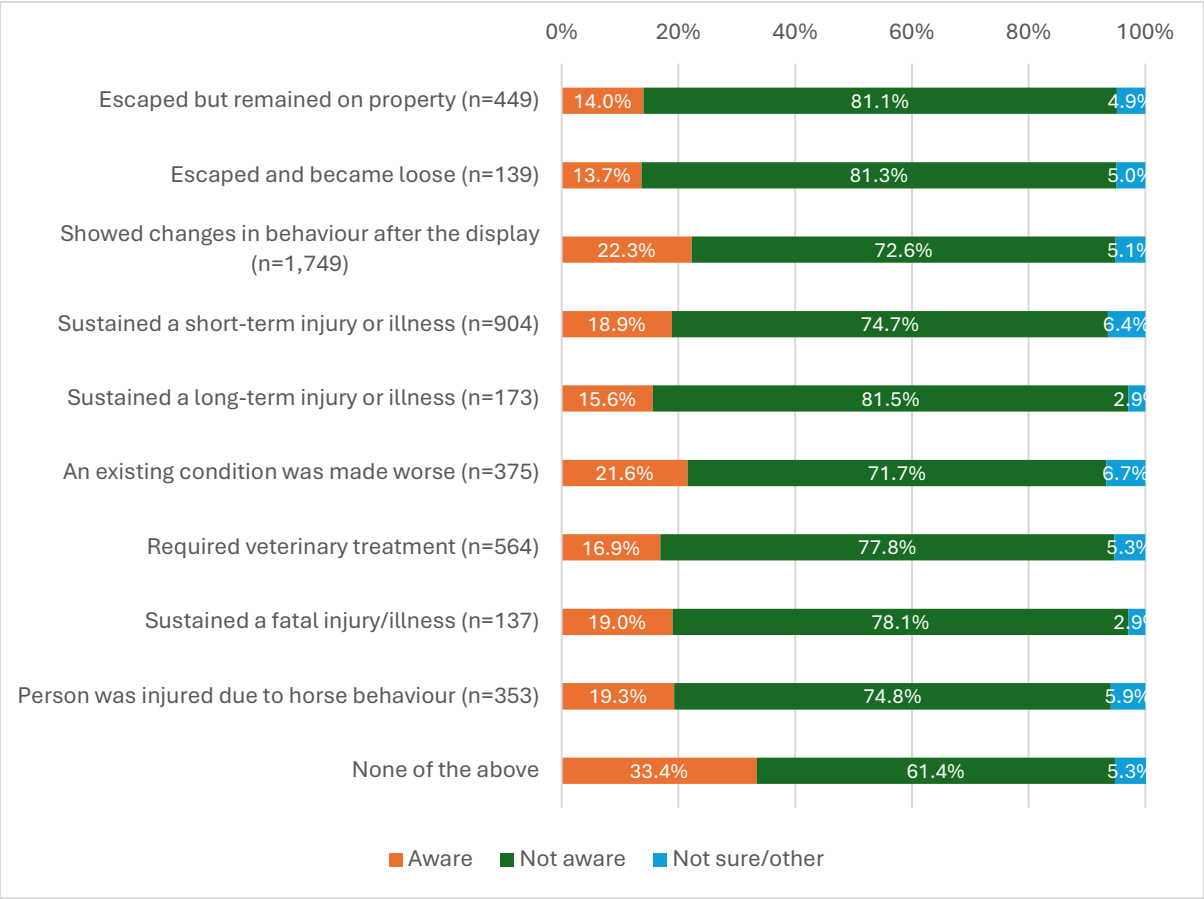

Figure 16. Outcomes resulting from horses becoming distressed by fireworks grouped by owner's awareness of the planned display (n=3,841) (respondents could select more than one option from the list of possible outcomes)

> "My neighbours now let me know that they are going to set off fireworks. It means I can ensure my horses are in, but they are still very upset in their stables."

11. Exposure to fireworks

Fireworks have long been associated with traditional annual dates in many cultures, including Bonfire Night in the UK and Diwali in Hindu culture. However, fireworks are now increasingly used for events throughout the year, both public occasions such as festivals and sporting fixtures, and private celebrations including weddings and gender reveal parties.

Fireworks have now become a traditional part of many New Year's Eve celebrations after displays were held to mark the turn of the millennium at the start of 2000.

11.1. Frequency of exposure

More than two thirds of survey respondents reported their horse is exposed to fireworks three or more times a year, with almost a third saying that exposure is not limited to traditional dates. Findings are shown in Figure 17.

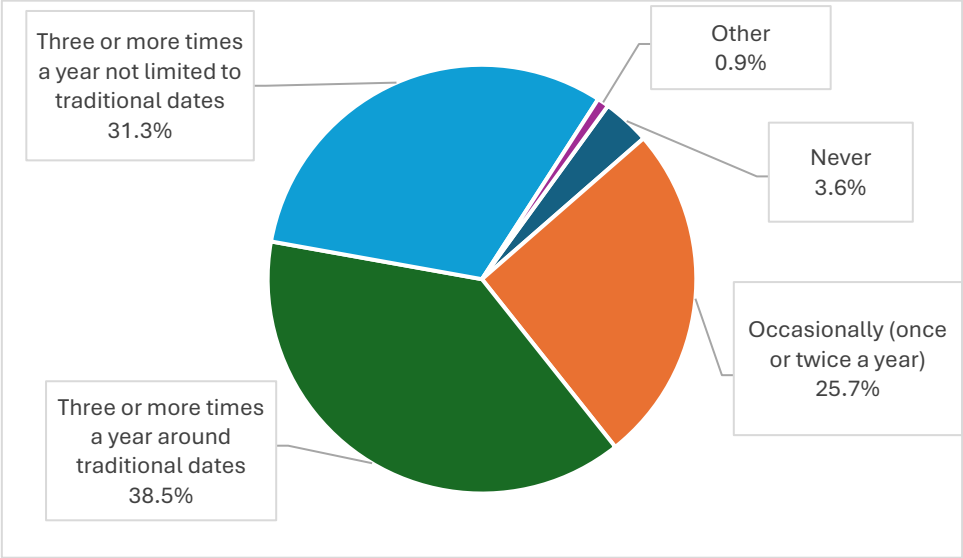

Figure 17. How often are fireworks let off close to where your horse is kept? (n=5,127)

"I spent ten evenings on firework watch this year, on most of them fireworks were let off."

"Unfortunately my neighbours don't stick to traditional dates i.e. Bonfire Night/Diwali and don't consider it necessary to inform me."

"We are near a golf course that holds weddings and events. They have very loud professional fireworks several times a year."

11.2. Types of display

More respondents' reported that their horse was exposed to private rather public firework displays. Almost half of respondents said their horse was only exposed to private displays and a further 38.3% exposed to a mix of private and public events. Only one in ten was only affected by public displays and less than 1% said the fireworks let off near their horse were low-noise displays. All results are shown in Figure 18.

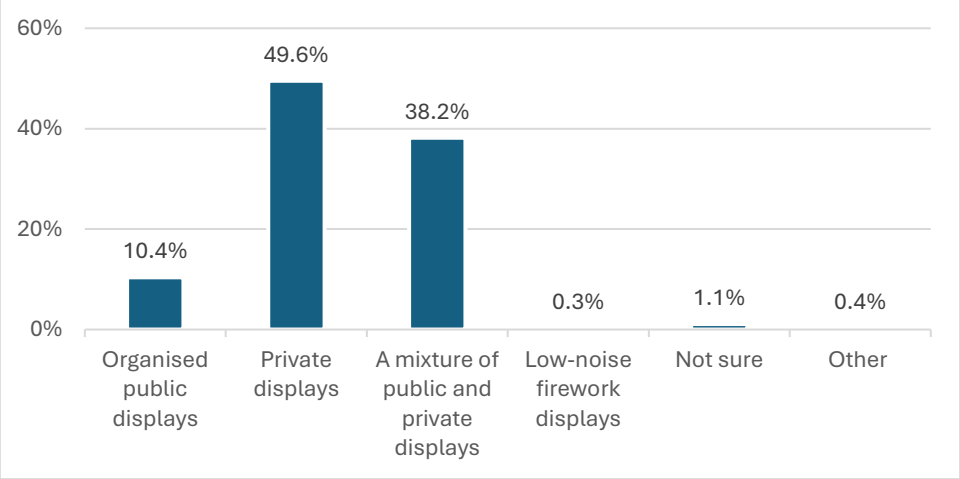

Figure 18. What type of firework displays tend to be held close to your horse? (n=4,969)

11.3. Type of display and awareness

More survey respondents had been aware of public displays held near their horse, with an increase in those being told directly by display organisers (18.3%) or seeing a general announcement in the area (27.4%). The greatest lack of awareness was in respondents affected only by private displays, with almost four out of five not knowing that fireworks were going to be let off. All findings are shown in Figure 19.

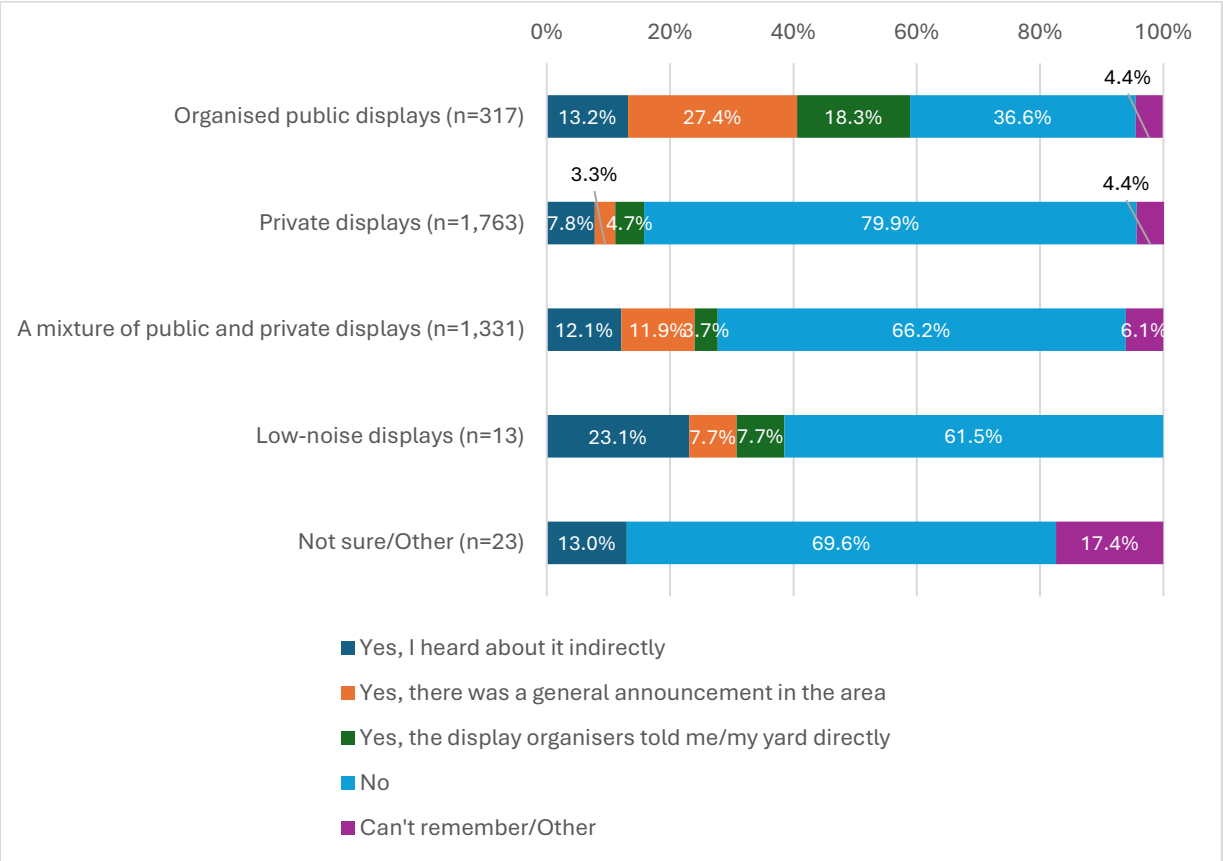

Figure 19. Type(s) of firework displays grouped by awareness of the event (n=4,969)

Where people experience multiple displays, there is likely to be variation both in whether and how horse owners are made aware of planned events. Most comments submitted under the 'Other option' reflected this inconsistency.

"Sometimes advised but mostly not"

"This year there were 15 displays over 9 days and we were warned about 3"

"The school put a general notice out to the village about displays, but neighbours and others including the pub do not notify anyone."

12. Could owners do more?

While the survey findings indicate that most owners do try to take steps to protect their horse from fireworks, the level of intervention varies as shown in Figure 6. Factors influencing the steps that people choose to take or not may include:

- Previous experience of the horse being affected by fireworks
- Resource availability (such as having access to a stable and a horse that is tolerant of being stabled)
- Restrictions on time and/or funds needed to put measures in place
- Balancing stress caused by fireworks with stress resulting from change of routine
- The level of anxiety felt by the owner

When asked the extent to which they agreed or disagreed that owners should do more to protect their horses from fireworks, just under a quarter of survey respondents agreed that owners should do more to protect their horses, with over 6% agreeing strongly. Almost 40% disagreed, with almost 15% strongly disagreeing. The data is shown in Figure 20.

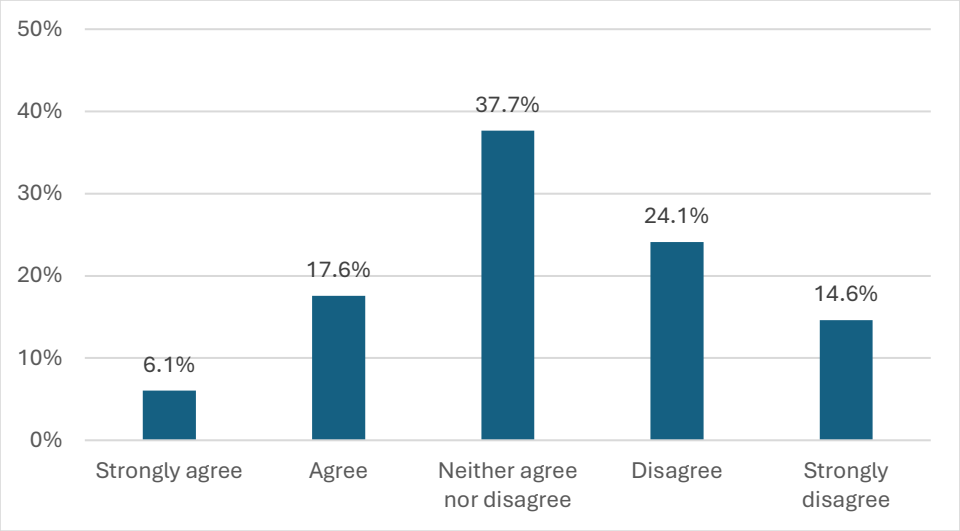

Figure 20. To what extent do you agree or disagree that owners should do more to protect their horses from fireworks (n=5,128)

In an additional Redwings study carried out in 2024, 100% of the 15 veterinary practices who contributed felt that clients already do as much as they can to try and protect their equines from the impact of fireworks.[23]

> "No matter what an owner does… if a situation's going to arise and a horse is going to go into that panic mode and into that fight or flight reaction, there's just not anything that they can do."

13. Calls for change

In view of the challenges many survey respondents faced in protecting their horse from the impact of fireworks, it is perhaps unsurprising that a high proportion stated they would like to see tighter regulations. More than 95% of respondents agreed there should be tighter regulation of fireworks, with almost 90% agreeing strongly with the statement. The data is shown in Figure 21.

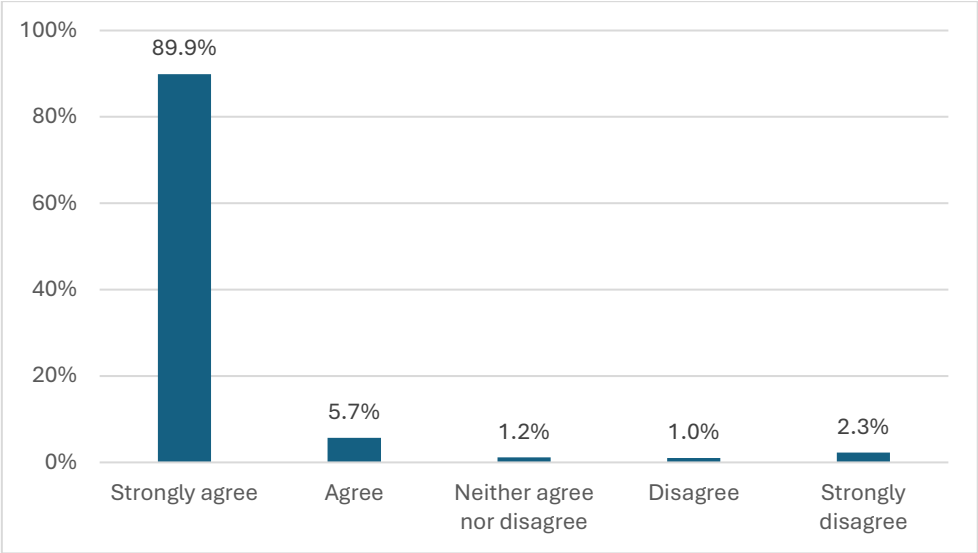

Figure 21. To what extent do you agree or disagree that there should be tighter regulation of fireworks? (n=5,128)

14. Conclusions

Insights shared through the Fireworks and Horses survey provides valuable data on the impact fireworks can have on horses. While it's clear many horses have a good tolerance to nearby displays, the high percentage of respondents with experience of horses being adversely affected by fireworks indicates that the issue of how to better protect horses from fireworks risk is a serious and ongoing concern for many equestrians.

[23] Redwings Horse Sanctuary (2025) *The impact of fireworks on veterinary practices and their clients.* https://www.redwings.org.uk/news-and-features/XLVetssurvey

The data suggests that horse owners would rather know when fireworks are planned in a location close to where they keep their horse. This allows them to take preventative steps that may be available to them to help reduce risk, and to monitor their horse to address any incidents that arise. Almost three quarters of survey respondents said they take steps to protect their horse, yet more than 70% of owners who had experienced a horse being adversely affected by fireworks said they hadn't been told the display was planned.

However, while making horse owners aware of displays is helpful, the survey findings show it is not enough to fully protect horses from possible distress, injury and even death when fireworks are let off.

Advice has traditionally been to stable horses to prevent them from acting on their urge to flee from something that frightens them. Current guidance acknowledges the stress that changes of routine can cause to horses, potentially reducing their tolerance to increased stressors such as fireworks. The survey findings show that knowing where best to locate a horse when fireworks are expected is not always an easy one for owners. Around half of respondents with firsthand experience of a horse being affected by fireworks said the horse was in a stable when fireworks were let off, and around half were turned out.

Comparing the behaviours seen in both stabled and turned-out horses believed to be a response to fireworks suggests that distress is not alleviated by being in a stable when fireworks are let off. Stabled horses were more commonly reported to have exhibited behaviours commonly associated with stress in all categories apart from one (attempting to escape). The differences in opportunities to monitor stabled and turned-out horses should be considered when interpreting this data.

Outcomes resulting from stress-related behaviours during fireworks indicate that stabling horses may reduce incidence of physical harm such as illness, injury or death, with fewer such outcomes reported in stabled horses compared to turned-out horses. However, stabled horses still face considerable risks when fireworks are let off. In addition, reports of horses showing behaviour changes lasting beyond the fireworks were slightly higher for stabled horses and there were increased injuries to people.

Measures commonly used by survey respondents to help keep their horses safe during fireworks were evaluated as having limited effectiveness. Findings suggest that use of products such as prescription sedation and over-the-counter calmers may be no more effective than other steps in many cases. Noise-reducing headwear also did not receive more favourable evaluation from survey respondents than other measures. Survey data on these measures was general and more specific research is needed to ascertain the effectiveness of different products and approaches when protecting horses from fireworks.

While some degree of respondent bias is likely for a self-selecting survey, the significant number of responses received gives credibility to the data as a source of valuable information and insight. The number of respondents who took measures, often involved and

costly ones, to keep their horses safe during fireworks conveys the widespread commitment owners have for the wellbeing of their equines.

Owners lose control of their horse's environment during a nearby fireworks display, particularly one involving loud explosions, and while options to regain that control remain so limited, distressing and sometimes tragic incidents will continue to occur and anxiety and frustration amongst equestrians will persist. Welcome advice for owners on steps that may help to protect horses from fireworks is widely available and reshared each year, yet these survey findings suggest that a shift in focus from the responsibilities of horse owners to the responsibilities of those who use, enjoy, manufacture, sell and regulate fireworks is needed.

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