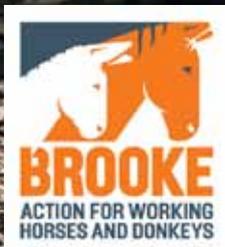


2 Understanding Equid Welfare Issues



Animal Health

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Animal Health

Eyes

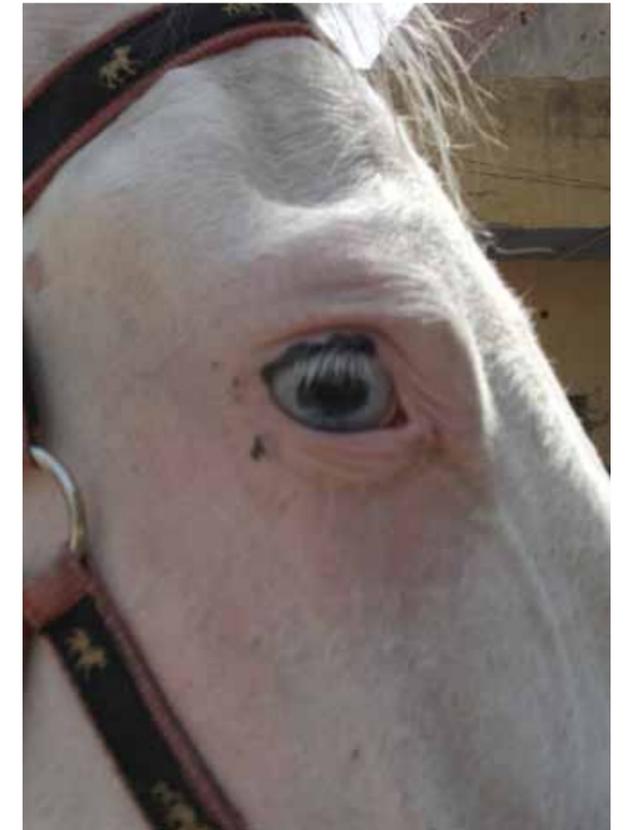
SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Eyes

Welfare issue

- The animal has an abnormality in one or both eyes. Problems with the eyes can include discharge and inflammation, lesions around the eye area, damaged or missing eyeballs, blindness.
- Eye problems are common in working equids, and are often preventable¹. The majority of eye problems can be identified at an early stage by a slight discharge caused by irritation from dust, flies or poorly fitted blinkers.
- Note that some equids have a blue coloured iris in one or both eyes, known as “wall eyes”. This is natural pigmentation and not an abnormality.
- Some animals, particularly white/grey horses, may have areas of mottled skin around the eyes with areas of both black and pink skin, which could be confused with lesions. Again, this is natural pigmentation, which often also occurs in the muzzle and genital areas of some horses.



Horse with wall eye.

Welfare significance

Pain/discomfort

- Equids, like people, find having a foreign body, dust or an injury to the eye intensely painful.
- Eye problems may lead to swollen eye lids, eye lids being clamped tightly shut, a change in eye colour (this can indicate changes within the eyeball itself), or redness or inflammation of the cornea or conjunctiva.
- Pain/discomfort may lead to reluctance to allow examination, and head-shy behaviour. Head-shyness and avoidance behaviours may in turn cause negative behavioural responses from owners.



Eye unable to open normally.

^{1,2} Brooke (2013)

Irritation, inflammation, excessive lacrimation

- Equine eyes are extremely sensitive and will develop an intense inflammatory response to damage or irritation, meaning that the initial problem can quickly escalate to scarring and possibly ultimately to blindness². The eye's response to such irritation is to produce large quantities of tears (lacrimation) to try and flush the dust or foreign body out of the eye. If the problem is not addressed, these tears will attract flies and can "scald" the skin of the face causing lesions.
- The amount, colour and consistency of any discharge is important as this can give an indication of the underlying problem.
- Clear, watery, discharge is usually a sign of a foreign body, irritation or an allergic reaction. Equids working in dusty environments will often have watery discharge.
- A thick white or yellow discharge is a sign of a bacterial infection. Dried, crusted, discharge around the eye suggests that the problem has been going on for some time.



Donkey with excessive tears.

Visual disturbance

- Anything which impairs the animal's ability to see clearly is likely to increase the risk of accidents or tripping during work. The animal's ability to predict and avoid collision is reduced, making them more susceptible to injury.
- Visual disturbance may also impair the animal's ability to interact normally with other equids, as they are less able to detect and interpret behaviour shown by other conspecifics.
- As a prey species, the ability to see and avoid potential prey is very significant for equids. It is possible that impaired vision may lead to increased fear for some animals, as they are unable to clearly appraise their environment and identify potential dangers. Fear during work may also be increased, particularly if they have memories of previous accidents.
- Blindness can be a welfare consequence of various conditions, including cataracts (clouding of the lens), ulceration of the cornea, damage to the optic nerve or retina from trauma, and even the complete loss of the eyeball.
- Equids can adapt to blindness if it is gradual in onset and the animal is kept in familiar surroundings, so the owner may not be aware of a problem until there is a change in routine. This means the owner may punish their animal for reluctance to go forwards, tripping/stumbling or for becoming nervous in unfamiliar surroundings. This is likely to cause further suffering for the animal.

Possible causation

Injury

- As equids have their eyes on the side of the head, they are vulnerable to injury through being caught on protruding objects such as nails, barbed wire or thorns. Injuries to the eyes are also commonly caused by owners whipping or beating the animal around the head area.
- Eye injuries should be treated as an emergency and attended to immediately to prevent further problems developing, which could lead to blindness.
- Eyelid lacerations usually heal quite well due to the good blood supply, however, suturing must be done with care to avoid distorting the shape of the eyelid. This could prevent the eye from closing properly which could lead to keratitis (inflammation of the cornea) or ulceration in the future³.
- Serious injury could lead to damage to the optic nerve or retina from trauma, or loss of the eyeball.

Blinkers

- Poorly fitted blinkers are a common cause of eye problems.
- Ill-fitting blinkers will rub the eye and cause irritation, shown by discharge from the eye and rubbed hair around the eye area. This will be worsened in dusty or dirty conditions where tight blinkers will rub the dust and other debris into the eye, which may be very abrasive and damaging.



Poorly-fitting blinkers, pressing on the eye.

Habronemiasis

- This is a parasitic condition which commonly involves the conjunctiva (inner lining of the eyelids), the outer eyelids and the nasolacrimal duct (a connecting duct from the eye exiting within the inner nostril on each side of the face). It is transmitted by house and stable flies feeding on discharge from the eyes.
- The condition is characterised by lesions and granular tissue around the eye and along the skin overlying the nasolacrimal duct as a result of larvae migrating into the conjunctiva and nasolacrimal system. These lesions can be very itchy (pruritus) or painful, and if left untreated the cornea can be damaged leading to blindness.



Habronemiasis lesions.

Equine Recurrent Uveitis

(ERU, moon blindness or periodic ophthalmia)

- Uveitis is common in working equids and is most commonly caused by chronic irritation⁴, and can affect one or both eyes.
- Repeated damage to the eye ball will result in scarring of the lens or cornea. This is irreversible and, depending on the size and location of the scarring, can interfere with the animal's vision.
- Once an animal has developed the condition, it will experience repeated attacks for the rest of its life. Each attack will cause more scarring and eventually total loss of vision⁵.

^{3,4,5} Brooke (2013)

Animal Health

Mucous Membranes

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Mucous membranes

Welfare issue

- The equid displays abnormal mucous membrane colour in the gums. "Abnormal" in this context refers to any deviation from a natural shiny pink colour, which includes pale/white, yellow (icteric), red or purple/blue.
- Note that some animals have normal areas of black pigmentation in the gums; this is not indicative of a health condition.
- Other mucous membranes are found inside the eyes and nasal passage, as well as the genital area; however only those in the upper gums are assessed during SEBWAT.



Location of mucous membranes and black pigmentation.

Welfare significance

- Mucous membrane colour reflects the oxygenation and perfusion (flow of blood through the body's blood vessels) of the tissues¹.
- The tissue in the mucous membranes is very thin and well supplied with blood vessels, so changes within body tissue are more visible in the mucous membranes than elsewhere in the body. Therefore mucous membranes can provide a good indication of the overall health of the animal.
- Any colour abnormality can indicate a potentially serious problem and should be assessed in conjunction with other clinical signs to ascertain the specific cause, because colour changes can be caused by various factors.
- When examining the mucous membranes, the amount of saliva present on the gums can also be observed, as a dry, sticky mouth is an indicator of dehydration.



Normal coloured mucous membranes.

Contamination

- Animals working or living in dusty environments (e.g. brick kilns, dusty dirt tracks, sandy soil) are vulnerable to contamination of the eye with debris from their environment. This will cause irritation, which if not addressed promptly, can proceed to more serious eye problems.
- A lack of regular eye cleaning, and poor hygiene in the animal's environment make eye problems due to contamination more likely.
- Fly fringes and fly masks can cause eye problems by irritating the eyes and contaminating them with dirt and debris, especially if the material is not kept clean.

Other

- Disease, e.g. bacterial or parasitic infection in the eye.
- Congenital conditions, e.g. cataracts and entropion (inversion of the eyelids so the eyelashes touch the cornea) are hereditary).

Means of resolution

- Daily cleaning of the eyes should occur to remove discharge and debris, and to check for any abnormalities.
- Blinkers should be avoided if possible. If owners are insistent upon using blinkers, these must have a smooth surface on the inside, be fitted so as not to touch the eyes at all, and be cleaned frequently.
- Fly fringes and fly masks should be used with caution, as they are often a source of abrasion and contamination. If used, these should not rub on the eyes, and must be kept clean.
- Habronemiasis can be prevented by cleaning the eyes daily to remove the discharge and through fly prevention measures such as fitting fly fringes and clearing the manure where flies breed from stables and paddocks⁶. If infection develops, treatment should be sought promptly.
- Housing and rest areas should be checked regularly for sources of injury, such as sharp edges or protruding nails.



Top: Unsuitable blinkers with sharp protrusions on the inside.
Bottom: Abrasion caused by a badly fitting fly mask.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

⁶ Brooke (2013)

¹ Brooke (2013)

Possible causation

Pale/white gums

A pale/white colour indicates that there is a reduction in red blood cells within the gum tissue. This can be due to:

- Anaemia - can have various causes including severe parasitic infestation, or disease such as equine infectious anaemia.
- Haemorrhage - blood leaking somewhere in the body, e.g. a bleeding injury or perforated gastric ulcer.
- Hypovolaemia (low blood volume) - can be due to haemorrhage e.g. from trauma, surgery, neoplasia (abnormal tissue growth/tumour); dehydration or fluid loss from severe diarrhoea, renal disease/failure or severe burns; accidental ingestion of anti-coagulant rodenticide (rat poison)².
- Pain/shock³ - due to traumatic injury or toxic shock.
- Dehydration - can have various causes including diarrhoea, excessive sweating, insufficient opportunity to drink.
- Chronic disease - such as equine infectious anaemia; tissue necrosis as a result of cancer of the internal organs⁴; bleeding gastric ulcers.



Pale coloured mucous membranes.



Yellow coloured mucous membranes.

Yellow gums

- Yellow (icteric) mucous membranes are usually associated with liver problems, and are caused by bile accumulating in the tissues rather than being excreted by the liver into the intestines (jaundice)⁵.
- Jaundice can be due to chronic liver disease, parasitic infestation or dietary reasons such as a diminished appetite (anorexia), malnutrition or a diet that is very rich in alfalfa⁶.
- Liver damage may be a result of poisoning through the ingestion of toxic plant material or noxious chemicals including lead, phosphorus, arsenic, copper or carbon tetrachloride.

² WSAVA (2014)

³ Field Service Penn Veterinary Medicine (date unknown)

^{4,6} Loving (2013)

⁵ Hayes (1992)

Red gums

- Bright "brick red" mucous membranes are symptomatic of endotoxaemia. This is a septic condition caused by bacteria escaping from the bowel into the bloodstream.
- The red colour is caused by blood pooling in the capillaries and blood vessels and is most easily observed in the mucous membranes. This generally indicates damage to the intestinal barrier leading to a systemic inflammatory response⁷.
- Endotoxaemia can be a complication of colic or enteritis and should be considered a veterinary emergency. If left untreated, intestinal shutdown can occur and the animal may lapse into potentially fatal endotoxaemic shock⁸.
- Sometimes foreign bodies (e.g. seeds) can become trapped in the gum margins or between the teeth, irritating the gums and causing them to present an inflamed, red appearance. This is localised and easy to differentiate from endotoxaemia.



Red coloured mucous membranes.

Purple/blue

- A darkening of the mucous membranes to a purple/blue colour indicates a prolonged state of shock. Sometimes it is possible to see blue (cyanotic) edges to the mucous membranes.
- The dark, bluish colour is due to blood pooling in the capillaries and blood vessels is stagnating and becoming de-oxygenated. This is a sign of serious circulatory problems.
- Animals with dark purple/blue mucous membranes present a poor prognosis and a high surgical risk⁹. As surgery for colic is not appropriate in the Brooke's context, the animal should be considered for euthanasia.



Dark coloured mucous membranes.

Means of resolution

- The means of resolution will depend upon the specific cause of the colour abnormality as described above. When changes to mucous membrane colour are identified, quick action to address the cause will improve the animal's chances of recovery.
- Pale/white mucous membranes may be treatable by owners in some cases; for example, parasite infestation can be treated with an appropriate de-wormer (anthelmintic) product, or an external bleeding injury (depending on location and severity) can be given first aid. More serious problems, however, will need veterinary intervention.
- Once the cause has been treated, the body will regenerate its blood supply to the correct volume and the gums will return to their natural colour.
- Yellow, red or purple/blue mucous membranes indicate a serious problem which is likely to be beyond the ability of owners to treat without veterinary assistance.
- Owners can contribute to prevention by ensuring that animals receive a good quality, balanced diet; animals remain hydrated, particularly during hot weather or when working; grazing and rest areas are free from toxic plants which could cause poisoning and rubbish which could damage the intestines; and risks of injury to the animal during work or rest environment are minimised.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

^{7,8} Blikslager quoted in Loving (2011) ⁹ Field Service (accessed 2015)

Animal Health

Ectoparasites: Bots



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Ectoparasites

Welfare significance

- Bot flies are generally considered to be less problematic than other internal parasites, however, their larvae can have an effect if present in sufficiently large numbers.
- Bot eggs are picked up in the mouth during self-grooming, and then hatch into first stage larvae, which burrow into the gums and tongue¹. This may cause irritation, which can affect feeding, and sometimes causes oral sores.
- If feeding is affected the animal may also start to lose condition.
- Pain from mouth sores may affect handling and bridling, in extreme cases making the animal reluctant to take the bit in its mouth.
- After doubling in size in the month (around one month), the larvae enter the interdental spaces of the upper molars² before migrating to the stomach for the second stage of development³. Once the larvae reach the stomach they burrow into the stomach wall which can cause lesions. This can cause discomfort or even colic, which could potentially have a detrimental effect on working ability⁴.

Welfare issue

- Equine has bot fly eggs present on its body, which, if ingested cause gastro-intestinal worms to develop inside the body.
- The bot fly eggs stick to the animal's hair and are picked up whilst self-grooming.
- Therefore, common sites are areas easily accessible to the animal's mouth, such as the fore limbs and flanks.

- Larvae in the stomach can affect the effectiveness of the digestive system leading to loss of condition, and occasionally cause stomach ulcers which may be fatal if perforation of the stomach wall occurs⁵.
- After the larvae have completed the second stage of development (around 8 months) they migrate to the rectum to be passed out of the body with the animal's faeces, and complete the final stage of development in the soil. If excessively large numbers of larvae migrate out of the stomach at the same time this can potentially cause a blockage of the intestine, interfering with the passage of food and causing discomfort. Any impact on normal gut motility is a potential cause of colic.
- Occasionally the larvae can hook onto the lining of the rectum which can cause the animal to strain when passing faeces. This is uncomfortable and has been associated with rectal prolapse in some cases⁶.

Possible causation

- Bot flies lay eggs on the animal's hair, predominantly on the forelimbs, neck, chest and mane area. These can be seen as tiny yellow or white eggs stuck to the animal's hair.
- Poor grooming/attention to hygiene may mean that opportunities to remove bot eggs before the animal has chance to ingest them may be missed.
- Adult flies lay their eggs on the host's hair in late summer and autumn in temperate climates but have a longer season of activity in warmer climates. They are killed by frost. This means that owners should be vigilant in removing eggs when the flies are active.



Bot fly eggs on the coat.

Means of resolution

- Regular grooming and inspection of the animal's coat to find and remove the eggs.
- Bot eggs can be removed carefully with a knife, a disposable razor, a very fine comb or by rubbing the eggs off with a rough stone. Care must be taken not to cause pain or injury to the animal when doing this. Eggs should not be picked off by hand as there is a chance they can remain and hatch under the finger-nails.
- As the bot fly larvae are generally not a major welfare concern, the use of drugs such as ivermectin to treat bot flies may not be appropriate; prevention through removal of the eggs is preferable. However, in locations where winter temperatures are very low, the adult flies die, and the bot fly population is only sustained by the larvae over-wintering in the animals' intestines. Therefore, if broad spectrum anthelmintics are used to treat a range of internal parasites, including bots, then the local population of bot flies may also be reduced.

- Note that faecal worm egg counts should be used to identify when de-worming drugs should be used and which parasites should be targeted; the Brooke does not condone blanket de-worming.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

^{1,3,4,5} Hayes (1992)

² Briggs (2004)

⁶ Brooke (2013)

Animal Health

Ectoparasites: Lice



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Ectoparasites

Welfare significance

- Lice are commonly found on animals kept in crowded, dirty environments and therefore can be an indication of other welfare issues or neglect. Animals suffering from infestations of lice often present an unkempt appearance with a thin, patchy hair coat, often with areas of hair loss.
- Very large numbers of lice can drain enough blood to have a detrimental effect on the animal's health². Blood loss due to parasites can cause weakness and anaemia (reflected in pale mucous membranes).



Lice eggs and associated hair loss.

Welfare issue

- The animal has lice or lice eggs present in the hair coat.
- There are two types of lice: “sucking lice” that feed on the animal's blood, and “chewing lice” that feed on dead skin cells¹. Both adult lice and eggs may be seen, often in the mane, tail and dorsal area; but can be anywhere on the body, particularly if present in large numbers.

Skin damage

- The irritation caused by the lice can be so severe as to lead to self-mutilation. In these cases the animal will scratch, rub or bite itself to the point of tearing out the hair and damaging the skin. Areas of hair loss can be extensive, and lesions may be created.
- Sunburn can be a complication of large areas of hair loss, particularly in animals with pink or pale coloured skin. This causes pain, and creates blisters and lesions on the burnt skin.
- Animals with lice often have thickened, flaky, scabby skin which is damaged easily and worsened by scratching.
- Abrasions from scratching can cause pain, and if the animal continues to scratch may weep serum and become lesions which are susceptible to local or systemic infection.

Irritation and discomfort

- The irritation (pruritis) caused by lice crawling on the skin can be considerable. The animal may display a restless demeanour, hoof stamping, tail swishing, scratching and biting at affected body parts.
- These behaviours can prevent the animal from being able to rest sufficiently or eat normally, and cause the animal to utilise energy on restless behaviour rather than maintenance, leading to exhaustion and loss of condition.
- Persistent itching will negatively affect psychological welfare, through continual discomfort and distress which cannot be easily relieved.

Possible causation

- High animal density (outdoors, indoors, or during transportation) promotes the transfer of lice through body-to-body contact.
- Lice are also capable of surviving away from a host for a period of up to 1-2 days which means they are easily transferred on shared equipment and fixed features such as walls and mangers. Communal rolling areas can also facilitate the spread of lice.
- Poor/infrequent grooming and lack of attention to hygiene means that opportunities to spot and treat lice are missed by the owner.
- Long, shaggy hair coats or long manes provide harbour for lice allowing populations to accumulate.

Means of resolution

- There are several topical treatments available to treat lice including pyrethroid insecticides (including permethrin), macrocyclic lactones (including ivermectin) and benzyl benzoate³. Care should be taken to ensure the correct dose, frequency of application and storage.
- Louse eggs are firmly attached to the animal's hair and can be difficult to remove without pulling out the hair; however, the egg casings should be removed before a de-lousing treatment is applied or the lice will hide in them and escape the treatment.
- Repeated treatments are likely to be necessary to kill lice which hatch after the initial treatment.
- All animals who are housed together should be treated at the same time as it is likely that all animals will be carrying lice even if not showing clinical signs of infestation.
- Regular grooming and inspection of the animal's hair coat will provide the opportunity to spot and treat lice before a widespread infestation can become established.
- Over-stocking (very high density of animals) of grazing areas and indoor housing should be avoided. This will also prevent over-grazing and allow animals sufficient space to move around freely and to rest.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

^{1,2} Hayes (1992)

³ The Brooke (2013)

Animal Health

Ectoparasites: Ticks



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Ectoparasites

Welfare issue

- The equid is carrying ticks on its body.
- Ticks are parasites which attach to their host, pierce the skin with their mouth parts and feed off the animal's blood. The tick will remain attached to the host until it has completed feeding. Whilst feeding the tick will swell to many times its original size, making it relatively easy to see compared to some other ectoparasites. Once the tick has completed feeding it will drop off.



Skin lesions due to tick bites.



Ticks under the tail

Welfare significance

Skin damage

- Tick bite sites can become infected or form lesions, which are then vulnerable to local or systemic infection.
- Bite sites can attract blowflies and screw-worm flies which lay their eggs in the wound. Maggots hatch from the eggs and invade the animal's living tissue, causing irritation and pain as they move around and burrow into the tissue. The larvae of the screw-worm fly can cause very serious lesions and untreated cases may die¹.

Irritation and discomfort

- When ticks are located under the tail or in the girth area they can easily be rubbed by harnessing, causing lesions and increasing the risk of infection.
- Ticks in the ears can lead to head-shyness (avoiding handling or contact around the head and ears), and a reluctance to have harnessing applied to the head.
- Heavy infestations of ticks can cause irritation and pruritis (itching). This can be observed in a restless demeanour, hoof stamping, tail swishing and biting or scratching at affected body parts. This can cause poor feeding and even prevent the animal from being able to rest sufficiently after work, leading to exhaustion and loss of condition.

Disease transmission

- Equine piroplasmiasis (also known as EP, babesiosis or biliary fever) is a disease caused by a tick-borne parasite (*Babesia caballi* or *Babesia equi*), which invades red blood cells causing them to break down (haemolysis), which leads to anaemia². The disease is fatal in more than 10% of cases and seriously affected equids may die 1-2 days from the onset of symptoms (the acute form of the disease). The disease is endemic in many tropical and sub-tropical countries when Brooke operates.
- In some cases the disease can progress more slowly over several weeks (the chronic form of the disease). During this time the animal rapidly loses condition. In these instances recovery can take months. After recovery the parasite remains in the red blood cells and can cause relapses for years afterwards, particularly following stressful events such as travelling or illness/injury. Further information on equine piroplasmiasis can be found in the Brooke Veterinary Manual (section 17.7), including clinical signs and treatment options.
- Some tick-borne diseases can be transmitted to humans, e.g. Lyme's disease, ehrlichiosis, babesiosis, or tick-borne encephalitis. A high number of ticks on horses has been found to be associated with an increased presence of ticks on humans³.

Tick paralysis

- Tick paralysis is caused by a toxin injected by several species of tick (including *Ixodes rubicundus* in southern Africa) when they bite. 40 ticks can be sufficient to bring on paralysis in an adult horse.
- The paralysis begins at the hind limbs but can progress throughout the body until paralysis of the heart and respiratory muscles causes death⁴.

Possible causation

- High animal density (outdoors, indoors, or during transportation) promotes the transfer of lice through body-to-body contact⁵.
- Equids kept in pasture shared with cattle are more likely to have ticks⁶.
- Pastures with long grasses and mixed bushes provide harbour for ticks, who hide in the grasses awaiting a passing host to attach on to.
- Poor/infrequent grooming and lack of attention to hygiene means that opportunities to spot and treat lice are missed by the owner.
- Long, shaggy hair coats or long manes provide harbour for ticks allowing populations to accumulate.

Means of resolution

- Over-stocking (very high density of animals) of grazing areas and indoor housing should be avoided. This will also prevent over-grazing and allow animals sufficient space to move around freely and to rest.
- Equids and cattle should graze separately if possible. Separating them with wire fencing can prevent cross contamination of ticks and eliminated infestations after removing cattle from the pasture⁷.
- A spelling (rest) period for grazing areas can reduce numbers of one-host ticks, but the pasture must be rested for longer than 60 days to be effective so is unlikely to be feasible in the Brooke context.
- Hiding places for ticks can be reduced by avoiding long grasses.
- Regular grooming and inspection of the animal's hair coat will provide the opportunity

to spot and remove ticks before a widespread infestation can become established. Care should be taken when manually removing ticks as they can transmit zoonoses.

- When removing ticks ensure the mouthparts are removed.
- Daily tick removal is the best option, in comparison to acaricides, which can be expensive and there is a limit to how frequently they can be safely applied.
- The *Babesia* parasite can be transmitted at all life stages of the tick, including stages when the tick may not be visible to the naked eye. This means that mechanical tick removal must also be combined with the correct use of acaricides (pesticides that target arachnids including ticks and lice).

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

¹ Hayes (1992)
² Brooke (2013)

^{3,5,6,7} Labruna et al (2001) ⁴ Hayes (1992)

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Body condition score

Welfare issue

- Body condition scoring is a system to estimate the levels of fat and muscle coverage, to identify whether an animal is too fat, too thin or a healthy weight. It can also be used to monitor changes in an animal's weight over time.
- The SEBWAT manual and Brooke veterinary manual give details on the system used by the Brooke and how to carry out a body condition score assessment. This system scores animals from 1-5, with 1 being very thin and 5 being very fat.

Note on donkeys

- Donkeys may have unevenly distributed fat deposits, called 'fat pads', particularly over the neck and hind quarters. These may be retained even if the donkey is losing weight¹, and should be ignored when scoring body condition.
- Aged donkeys can be particularly difficult to assign a body condition score due to a lack of muscle and a dropped belly giving a thin appearance, even when the animal's overall condition may be healthy².



Donkey with low body condition score.

^{1,2} McDowell (2009)

Welfare significance

- The animal's body condition is an indication of the overall health of the animal, and reflects upon work load, feeding practices, quality of husbandry, illness and can indicate whether any of these factors are improving or declining.
- A low body condition score is affected by the ratio of energy consumed compared to energy expended. When too little energy is consumed to meet the animal's energy requirements, the animal will become underweight, and vice versa.

Low body condition score

- Working equids with low body condition scores (less than 2.5) are commonly presented for treatment³ to field veterinarians or encountered during welfare assessments, in communities with a low income and can appear to be the norm in some countries. This does not make it acceptable for the animals' welfare'.

Good body condition score

- Animals with a healthy body condition score (2.5 - 3.5) have the best chance of all round health, less risk of lesions, and are best able to meet the demands of their working role. They appear well rounded, their bones are not easily visible and they have some, but not excess, levels of fat.

High body condition score

- Whilst a low body condition score presents a dramatic illustration of compromised welfare, it is important to note that a high body condition score (more than 3.5) indicates obesity, which is also a welfare concern.



Horse with low body condition.

³ Brooke (2013)

⁴ Geor (2008)

^{5,6} Donkey Sanctuary (2014)

- A high body condition score, particularly when associated with a thick crest on the neck, is a predisposing factor in the development of laminitis⁴.
- Obesity causes greater strain on the heart during work, causing the animal to tire more quickly.
- Fat equids may also suffer injuries and degeneration of the joints and tendons as the limbs receive additional concussive forces when the overweight animal moves. These forces are increased further if fast work, or work on hard surfaces such as tarmac roads, is involved.

Hyperlipaemia

- Donkeys (and some breeds of horse) are particularly susceptible to hyperlipaemia⁵. Hyperlipaemia occurs where more energy is being used than is being taken in, such as in an animal with a low body condition score being over-worked.
- This causes the body to release stored fat for conversion to glucose in an attempt to meet energy requirements. This fat floods the bloodstream causing the liver and kidneys to degenerate and ultimately to fail, causing death⁶.
- The condition can also occur in overweight animals who are starved in an attempt to reduce weight, for example in the treatment of laminitis. It can also be triggered by stress.



Horse with good body condition.

Possible causation

- Since low body condition is a far more prevalent problem than high body condition score in the Brooke context, the following suggestions focus on the former.

Inadequate quantity of feed

- In the working equine context, feed is often insufficient in quantity and calorific content.
- To maintain condition, working equids need a combination of carbohydrate and protein, and sufficient quantities of fibre to aid digestion.
- Grains like oats, barley and maize are used to provide additional energy for equids in hard work.
- Care needs to be taken that the animal is not overloaded with concentrate by feeding too much grain at one time, as a concentrate overload can cause colic or trigger laminitis. Grains (or concentrated feeds) should be spread over several meals and ideally mixed with high fibre feed such as chaff or sugar beet.

Cold

- Equids living and working in cold climates or at high altitude will expend additional energy on keeping warm. The digestive process generates heat but when this is insufficient to keep the animal warm, secondary processes such as shivering will use energy in an attempt to generate warmth.
- Note: donkey hair coats do not have the same waterproof properties as horse/mule coats and so donkeys should be protected from getting wet or they can quickly become chilled.



Donkey with blanket.



Aggression between individuals at feeding time - note the backwards ear position and muzzle tension.

Inappetance or inability to eat

- Equids who are reluctant to eat will quickly lose condition, therefore the underlying cause of inappetance/anorexia should always be investigated.
- Animals suffering from pain in the mouth will have difficulty eating. This pain can come from mouth or lip lesions (see [Lip lesions](#) section for further details), poor dentition (e.g. overgrown, damaged or missing teeth), or injury (e.g. firing of the palate as a 'treatment' for lampas, or damage to the tongue).
- An animal may be reluctant to eat due to bullying from more dominant animals at feed time or fear of injury from foreign objects in the feed.

Digestive problems

- If the digestive system is compromised the animal will not receive the full benefit of nutrition from its feed, because nutrients will not be absorbed correctly or normally.
- This could be due to intestinal parasites, dehydration or diarrhoea (when the food passes through the digestive system too quickly for nutrients to be adequately absorbed).
- Some diseases, such as liver disease, can prevent an animal from metabolising food properly.

Poor quality of feed

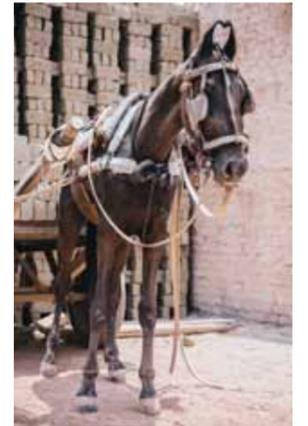
- Feed should be carefully stored to avoid contamination from insects or rodents or the development of mould.
- Before feeding, feed should be checked for foreign bodies which could cause injury or discourage the animal from eating, e.g. stones, sand or grit.

Overwork

- The other side of the energy ratio is excessive energy output. Overwork can cause loss of condition even in animals receiving large quantities of food, and is the most common cause of excessive energy output.
- Equids require adequate rest periods to recover from work. Suitable rest areas should be provided with appropriate bedding or comfortable flooring, such as sand or grass, to encourage lying down and harnesses should be removed during rest.
- Equids should only be worked within their capabilities, i.e. young, aged or unfit animals should have lighter workloads, and ill animals should not be worked until they have recovered.

Disease, pain or fever

- An ill equid will use more energy in carrying out normal bodily functions than a healthy animal. For example, animals suffering from advanced respiratory disease will expend more energy breathing due to the effort required to force air out of the lungs (see [Respiratory noise](#) and [Nasal discharge](#) sections for further details).
- Animals suffering chronic pain will lose condition because they move less efficiently meaning more energy is expended for the same level of work (see the [Lameness, Fear and aggression](#), [Firing](#) and [Apathy](#) sections for further links to chronic pain).



Equids with poor body condition being worked.

Means of resolution

- Feed quantity and quality, and workload and rest should be adjusted to meet the animal's requirements and maintain healthy body condition score.
- Animals who are ill, injured, or in pain should be treated in a timely manner, and permitted to rest until recovered.
- De-worming should occur when indicated (by a high fecal egg count) to reduce endoparasite burden and associated digestive problems.
- Oral/dental pain or injury should be addressed in a timely manner, and any inappetance investigated to identify the cause.
- Animals in cold conditions should be provided shelter and blankets to keep warm.
- Owners should be encouraged to monitor body condition regularly and respond to any unwanted changes.

Refer to the *Working Equid Veterinary Manual*, *Community Engagement work plans or strategies* and the *Handling Guidelines*

Animal Health

Nasal Discharge



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

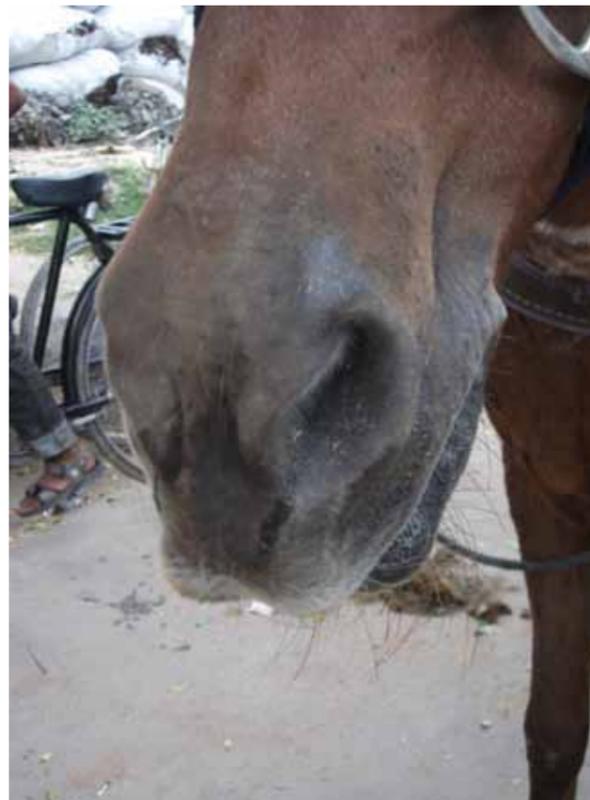
Nasal Discharge

Welfare issue

- The equid displays discharge from one or both nostrils.
- In SEBWAT, only opaque liquid discharge or blood-stained discharge is recorded. However, in some cases transparent discharge may be associated with respiratory problems too.

Welfare significance

- The amount, colour and consistency of any nasal discharge are important as this can give an indication of the underlying problem.
- Transparent, watery discharge can be due to irritation or an allergic reaction caused by dust, pollens or a foreign body. Equids working in dusty environments will often have watery discharge. Airborne allergens will initially cause a clear nasal discharge, clear ocular discharge, coughing and sneezing and increased respiratory rate. They can develop into more serious and chronic conditions that can reduce the animal's productivity and health, e.g. allergic respiratory disease and Recurrent Airway Obstruction (RAO - also known as Chronic Obstructive Pulmonary Disease (COPD) or 'heaves'). Inflammation due to an allergic response will increase susceptibility to secondary bacterial infections, which are common in working equids¹.
- Transparent discharge may also have a viral cause even when only a small amount of bilateral watery nasal discharge is present².
- A thick white or yellow discharge is often a sign of a bacterial infection. However, this may also indicate fungal infection in some cases, or even African Horse Sickness which is viral but can cause white frothy discharge.
- Dried, crusted discharge around the nostrils suggests that the problem has been occurring for some time.
- Some signs of respiratory problems can be very subtle, e.g. a small increase in watery discharge from the nose, a slight cough or sneeze, or reduced vigour³.



Transparent discharge from nostril.

Possible causation

Environmental factors

- The equine respiratory tract cannot cleanse air as it is breathed in, therefore all air enters, regardless of quality.
- This means that an animal living or working in an environment where air quality is poor, such as brick kilns or dusty roads, risks damage to the respiratory tract.
- The use of smoking drums around equids to discourage flies is not effective and will also contribute to respiratory problems.
- Dust, e.g. from dirt roads, dirt paddocks, poor quality feed, poorly-ventilated work or accommodation areas, feeding dry or dusty feed in a nose bag dry.
- Mould spores, e.g. from poor quality feed.
- Smoke and other air pollutants, e.g. from cooking fires, brick kilns, or smoking drums used as fly control.

Bacterial infection

- A thick white, yellow or green discharge indicates a bacterial respiratory infection that may be the primary cause of illness, or a secondary complication, e.g. a respiratory virus, or a foreign body.
- Bacterial respiratory infections include strangles, bacterial pneumonia, pleuropneumonia and glanders (which is zoonotic). Further details on these conditions, including symptoms and treatment, can be found in the Brooke Veterinary Manual.
- Airborne bacterial infections, like strangles, are extremely contagious. They can be transmitted by nose-to-nose contact between animals and also through droplets carried on hands, clothing, nose bags, communal water troughs, harnesses and other equipment, and are often brought into a community of equids by the introduction of a new (infected) animal.

Viral infection

- Respiratory viruses are highly contagious and different viruses often have very similar symptoms⁴. Respiratory viruses include equine influenza, equine herpes viruses (EHV) and rhinoviruses.
- Viruses are characterised by substantial, thick grey/yellow nasal discharge. A secondary bacterial infection can develop as a complication of a respiratory virus.
- It has been suggested that working equids are at greater risk of contracting influenza than other equids, that infection will be more severe, and recovery will be longer⁵. This is due to the additional stresses on the body and weakened immune system common in working equines.
- Like bacterial infections, respiratory viruses are transmitted by breathing infected droplets and by direct contact with nasal secretions⁶.
- African Horse Sickness, unlike other respiratory diseases, is not contagious between individual equids but is transmitted by the bites of the *Culicoides* midge, therefore fly control is an important preventative measure.



Opaque discharge.

^{1,2,3} Brooke (2013)

^{4,6} Brooke (2013)

⁵ Abd El-rahim and Hussein (2004) quoted in Brooke (2013)



Blood-stained discharge.

Epistaxis

- Epistaxis is bleeding from the nose. This can be from one or both nostrils and can range from a slow drip to a substantial and life threatening haemorrhage.
- Bloody nasal discharge may be due to bleeding from the nasal cavity, from the guttural pouches, or from the lungs.
- Bleeding from the nasal cavity has a number of causes, including trauma to the face or nostrils, infection resulting in erosion (e.g. sinusitis, fungal infection, granulomas), neoplasia (abnormal tissue growths), or a foreign body.
- Bleeding from the guttural pouches can be caused by either fungal or bacterial infection (e.g. strangles).
- Bleeding from the lungs may occur as a result of exercise-induced pulmonary haemorrhage, or pulmonary abscess.

Food regurgitated from the nose

- The most common cause of food being regurgitated through the nose is 'choke'. This is where an obstruction (usually food) in the oesophagus blocks the passing food causing it to be regurgitated through the nose (equines are anatomically unable to vomit).
- Choke is commonly caused by eating inappropriate or very dry food, or eating too quickly, failing to chew food sufficiently before swallowing. It can also be caused by tooth abnormalities, which cause food to become trapped and accumulate at the back of the mouth.
- Choke should be treated as an emergency, as food may be inhaled into the lungs causing aspiration pneumonia. There is also a danger that the oesophagus could be ruptured.
- Older equids with poor teeth are more predisposed to choke.

Fungal infection

- Guttural pouch infections (e.g. *aspergillosis*) and sinusitis often have a fungal cause.
- *Coccidiomycosis* is a fungal infection found in Central and South America which may affect nasal tissues, leading to nasal discharge and other respiratory symptoms⁷.

⁷ Long et al. (2014)

Means of resolution

- Good hygiene and avoiding of cross-contamination is key for preventing infections and viruses. Handlers should wash their hands between animals and take particular care if respiratory infection is suspected.
- Quarantine procedures should be followed whenever possible when introducing new animals to an existing group. New animals of unknown origin should be isolated and carefully monitored for signs of infectious disease for three weeks before mixing with others. Behaviour and social needs (e.g. visual contact with other animals) must be considered.
- Drenching (forcibly administering liquid medications orally) should be avoided, as this is a possible cause of aspiration pneumonia if the medications being administered accidentally enter the lungs. Dehydration is a serious welfare concern in working horses and donkeys. We strongly advocate that animals are offered clean, fresh water throughout the day and that they are given the time and space to drink. In circumstances where animals are unable or unwilling to drink, fluid therapy may be required.
- Dampening feed or hay reduces dust and mould spores, and is often recommended for animals at risk of respiratory problems⁸. Beware of soaking hay for longer than 1 hour, as this will reduce its nutrient content. Once soaked, the hay should not be stored due to the risk of dangerous mould growth, so should be fed to the animal straight away. The effluent run off is also an environmental pollutant.
- The use of nose bags should be avoided, as they reduce ventilation and quality of air.
- Vaccination, if available, can prevent some viruses e.g. equine influenza.
- Any respiratory problems should be investigated straight away, because the earlier treatment is started, the better the long term prognosis.
- Equids suffering or recovering from respiratory problems should be given rest and a reduced workload, particularly in cases where significant damage to the airway may have occurred.
- It should be emphasised to owners and local service providers that slitting of the nostrils does not improve breathing, or cure or prevent respiratory problems and will only increase suffering and risk of infection. (See the [Mutilations](#) section for further information.)

We believe oral fluid therapy is the most physiological and least invasive way to restore hydration. Providing fluids through nasogastric intubation (through the nose to the stomach) is more practical than IV fluids because owners have access to water, buckets and funnels and service providers can easily carry a stomach tube, lubricant and electrolytes.

- In accommodation, ensuring good ventilation, avoiding overcrowding with too many animals, and use of bedding materials that are low in dust are good practices.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention..

⁸ University of Kentucky (2014)

Animal Health

Respiratory Noise



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Respiratory noise

Welfare issue

- The equid makes an audible noise whilst breathing, which can be heard without the use of a stethoscope.

Welfare significance

- Respiratory tract problems are common in working equids. Signs of respiratory problems can be very subtle, often just a small increase in watery discharge from the nose, a slight cough or sneeze, or the animal being described as less vigorous than normal by the owner¹. An animal with respiratory noise that is audible without a stethoscope suggests a serious abnormality.
- Equids suffering respiratory difficulties tire more quickly, lose condition and be less productive than their healthy counterparts. This is because the body's muscles require oxygen to work efficiently, therefore any problems with the respiratory tract will reduce the amount of oxygen the animal can uptake.



Respiratory noise can be subtle, but serious.

¹ Brooke (2013)

² Horse and Hound (2003)

Possible causation

- Abnormal breathing sounds have various causes or be exacerbated by different factors, for example:
- Living or working in an environment that is dusty or contaminated with air pollutants, mould spores, etc.
- Bacterial, viral or fungal infection of the sinus, or upper or lower respiratory tract.
- Prolonged elevation of the head.
- Parasitism (e.g. lungworm).
- Exertion (e.g. laryngeal paralysis typically causes noise during exercise²).

Some examples of different types of respiratory sounds and possible causative factors are given below.

Coughs

- A cough is a reflex action used by the body to remove irritants from the airway. Equids may cough as a result of irritation caused by foreign bodies inhaled into the airway (e.g. dust particles, mould spores, pollen, fragments of fodder, etc.); a viral or bacterial infection; or chronic inflammation of the tissues of the respiratory tract.
- Frequent or chronic coughing indicates a problem and is often accompanied by other symptoms such as nasal discharge, raised temperature, or accelerated respiratory rate.

Wheezes

- Wheezes are a continuous noise made both on the in-breath (inspiration) and the out-breath (expiration). Wheezing indicates inflammation within the respiratory tract, for example in chronic allergic conditions where the nasal passage, trachea and lungs become inflamed, restricting the passage of air and causing a wheezing sound as the air is squeezed past the inflamed tissues.
- Recurrent Airway Obstruction (RAO, also known as Chronic Obstructive Pulmonary Disease, COPD or heaves) is a common cause of wheezing sounds. Often the animal will show flared nostrils even at rest, and may also develop a 'heaves line' on the flank below the ribs, caused by abnormal muscle development due to the extra effort required to expel air from the lungs.
- Animals with chronic RAO may lose weight as the effort required to breathe burns more calories than the animal is able to replace. They can also expend more time and energy on breathing than eating³. An equid in this condition has been likened to a human suffering end-stage lung cancer⁴ and euthanasia may be the most humane option.

Crackles

- Discontinued crackling sounds can indicate that fluid is present in the lungs, for example in pleuropneumonia or other disorders which cause lung oedema.
- As grazing animals, equids are designed to breathe efficiently with their heads lowered. Forcibly preventing an equid from lowering the head can result in fluid collecting in the lungs, for example through the animal spending long periods tied up on a short tie (e.g. when travelling or not being worked) or harnessed as to prevent the animal lowering its head.
- Equids should be regularly offered the opportunity to lower their heads to ground level to clear the airway, which can be combined with providing opportunities to graze and drink.

Squeaking/grating sounds

- Known as 'friction rubs', these sounds are caused by the overlying membranes of the lungs and the ribs rubbing against each other. These sounds usually indicate pleuritis, which is an inflammation of these membranes, often caused by viral infections.
- They are not likely to be heard without a stethoscope.

Snoring

- A snoring sound when breathing is characteristic of sinusitis and will usually be accompanied by a thick discharge of pus from the nostril on the affected side of the face, and there may also be facial swelling and pain on palpitation.
- If the condition is chronic or is related to a dental problem, (e.g. an infected tooth), then the discharge often has a foul smell. There may also be difficulty in breathing which is made worse by exercise.
- Sinus infections often recur and can be frustrating to treat⁵.

Rattles

- Loud, moist rattling sounds accompanied by rapid, laboured breathing; cough, nasal discharge and raised temperature in a foal can indicate *rhodococcus equi* infection (also known as summer pneumonia, or 'rattles').
- The condition is characterised by abscesses in the lungs and the development of pneumonia. Treatment is difficult and the prognosis is poor⁶.

Note on donkeys

- Donkeys rarely cough when suffering from respiratory disease and may display only subtle clinical signs. Cases in donkeys are often presented for veterinary assistance only once the respiratory problem is advanced and severe⁷.

^{3,4} Smith Thomas (2015)

^{5,7} Brooke (2013)

⁶ Hayes (1992)

Means of resolution

- Minimising the animal's exposure to dust, mould, smoke and other air pollutants in the environment, and ensuring rest away from polluted environments, can reduce risk and severity of respiratory problems.
- Good hygiene and avoiding cross-contamination is key to prevent infections and viruses. Handlers should wash their hands between animals and take particular care if respiratory infection is suspected.
- Quarantine procedures should be followed whenever possible when introducing new animals to an existing group, during which new animals of unknown origin should be isolated and carefully monitored for signs of infectious disease for three weeks before mixing with others. Behaviour and social needs (e.g. visual contact with other animals) must be considered.
- Drenching (forcibly administering liquid medications orally) should be avoided, as this is a possible cause of aspiration pneumonia if the medications being administered accidentally enter the lungs. Dehydration is a serious welfare concern in working horses and donkeys. We strongly advocate that animals are offered clean, fresh water throughout the day and that they are given the time and space to drink. In circumstances where animals are unable or unwilling to drink, fluid therapy may be required.
- In accommodation, ensuring good ventilation, avoiding overcrowding with too many animals, and using bedding materials that are low in dust are good practices.
- Dampening feed or hay reduces dust and mould spores, and is often recommended practice for animals at risk of respiratory problems⁸. Beware of soaking hay for longer than 1 hour as this reduces its nutrient content. Once soaked, the hay should not be stored due to the risk of dangerous mould growth, so should be fed to the animal straight away. The effluent run off is also an environmental pollutant.
- The use of nose bags should be avoided, as they reduce ventilation and quality of air.
- Preventative treatment includes vaccination where available, and anthelmintics when appropriate.
- Any respiratory problems should be investigated straight away, because the earlier treatment is started, the better the long term prognosis.
- Equids suffering or recovering from respiratory problems should be given rest and a reduced workload, particularly in cases where significant damage to the airway may have occurred.
- It should be emphasised to owners and local service providers that slitting of the nostrils does not improve breathing, or cure or prevent respiratory problems and will only increase suffering and risk of infection. (See the **Mutilations** section for further information.)

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Animals should be unharnessed or the pack removed to allow air to circulate around skin, reducing bacteria etc.



Better use of nosebag, as it is not attached to the head, so the animal is able to get air more easily.

⁸ University of Kentucky (2014)

Animal Health

Spinal Pain

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Spinal contact

Gait

Withers/spine lesions

Welfare issue

- The equid displays evidence of pain on gentle contact with the spine.
- This may be a mild reaction such as tensing of muscles of the back or neck, or flinching of part of the spine being touched; or a larger reaction such as bending the spine, moving away, lifting the head, kicking or biting. Restricted movement, and unwillingness to move the spine, can also indicate pain.
- If the pain is severe or chronic, the animal may display avoidance behaviour to prevent the spine being touched at all.

Welfare significance

- Equids have relatively inflexible spines compared to other species¹. This provides greater strength, enabling them to carry heavy loads and to be ridden, but when spinal problems occur the added pressure from carrying or pulling a load can worsen the effects.
- Spinal pain is a key welfare issue because it can be difficult to identify, so animals may be living with undiagnosed pain for long periods of time.
- Pain tolerances are affected by an individual animal's temperament, so gradual changes in temperament or behaviour may not be noticed by owners for a long time, or may be viewed as laziness or reluctance to work. This could result in beating or other punishment from owners in an attempt to make the animal work more, missing the cause.
- Aggressive behaviour in equids is very closely linked to pain², so aggressive animals should always be assessed for painful conditions before owners attempt 'corrective' actions or punishment.

Musculo-skeletal problems

- Spinal pain can have long-term consequences on the animal's musculo-skeletal system by causing uneven muscle development on one side of the body due to atrophy (wasting) of the damaged muscles, or overusing some muscles to spare and protect the painful areas.
- Signs of abnormal muscle development include asymmetrical hip or shoulder conformation and lameness.
- A Brooke study in Pakistan found that donkeys with more severe pain responses to manipulation of the spine showed worse muscular asymmetry of the shoulders³. It also found that spinal pain responses were more likely in donkeys with higher lameness scores.



Asymmetrical pelvis.

¹ Jeffcott (1998)

² Brooke (2013)

³ Reix et al (2014)

Chronic pain

- Chronic pain can lead to the development of other problems including a suppressed immune system, which reduces the ability to fight infection; disturbed rest or loss of appetite leading to loss of condition. It can also lead to the animal becoming increasingly withdrawn and depressed until an apathetic state is reached.

Signs of back pain

- Difficulty straddling to urinate/defecate.
- Avoidance, aggression or tensing in response to being touched or groomed over the back, loins or hind quarters.
- Avoidance, aggression or tensing in response to attempts to put on a blanket, saddle or harness.
- Avoidance of or reduced lying down or rolling.
- Reluctance to pick up the hind limbs.
- Rushing forward or pulling in an attempt to run away from the pain, or conversely moving slowly and uncomfortably, showing reluctance to move forwards.
- Difficulty moving backwards⁴.
- Lameness and changes to the animal's gait.

Possible causation

- Spinal pain can be a secondary result of pain elsewhere causing the animal to change its posture.
- Unnatural postural changes and gait adaptations can transfer physical stress to different parts of the body, e.g. hoof pain causing the animal to walk in an unnatural way, leading to back pain.



Abnormal posture.

Falls and accidents

- A common cause of spinal pain is accidental trauma injury e.g. due to a fall or traffic accident.
- Fractures of the thoracolumbar area (the area from the withers to the rump) are seen as a result of rearing up and falling over backwards. Sometimes this is done deliberately by owners to 'teach' the animal not to rear, which is a serious welfare concern.
- The lumbar spine (the tail-end of the spine) can also be fractured by the animal falling on its tail or by being hit from behind e.g. by a vehicle. Lumbar spine fractures have a grave prognosis.
- Fractures are slow to heal and the intensive treatment required may not be practical in the working equine context, so euthanasia may be necessary.

Spinal pain due to work

- Back pain may be directly associated with overwork and overloading of badly designed carts and harness⁵.
- In equids used for riding, soft tissue damage is commonly caused by poorly fitting saddles. Visible evidence includes lesions and pressure sores, but there may also be invisible bruising and ligament damage.
- A study showed that 71% of working donkeys in Pakistan had a lesion or scar in the spinal area⁶. These injuries are painful in themselves but also implicate poorly fitting harness as a likely reason for back pain and stiffness.



Checking response to spinal contact.



Severe spinal lesion caused by a poorly fitting and overloaded pack.

Means of resolution

- Working with owners and harness makers could encourage the use of well made, well-fitting and well maintained harness⁷ and carts to protect the spine.
- Owners/handlers should be educated on recognising lameness and spinal pain, and encouraged to reduce over-work and over-loading wherever possible.
- Using warm compress and gentle massage or "strapping" the back muscles after exercise can reduce muscular back pain. Simple massage techniques can be taught to owners and do not require expensive equipment.
- Analgesics can be used to reduce pain to allow recuperation to take place but care must be taken that they do not simply mask the problem. They should be combined with efforts to identify and resolve the underlying problem, and provide rest with a gradual return to work whenever possible.
- Some animals may have weaker back conformation than others, so it should never be assumed that all animals can carry the same load.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.



Pack designed to provide spinal clearance.



Pack designed to provide spinal clearance.

⁴ Jeffcott (1998)

^{5,6} Reix et al (2014)

⁷ Brooke (2013)

Animal Health

Body Lesions



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

- Head/ears
- Neck
- Breast/shoulders
- Forelimbs
- Knee
- Withers/spine
- Ribs/flank
- Girth/belly
- Hindquarters
- Hindlimbs
- Tail/tail base
- Genital/rectal

Welfare significance

- The equid displays lesions (wounds) on the skin in the specified body area.
- Note: lesions in the corners of the mouth and around the eye area are covered in the *Lip lesions* and *Eyes* sections respectively. Lesions associated with the human practices of *firing* and *hobbling* are covered in those sections.

Welfare significance

- Lesions on any body part will cause pain and discomfort. Equids with severe or persistent lesions experience chronic pain, and will work less efficiently than healthy, pain-free animals. This may trigger negative interactions from owners, such as beating, in an attempt to make the animal work more. Over the long term, animals are at risk of becoming apathetic (see the *Apathy* section for more details).
- Any wound to the skin leaves the animal vulnerable to local or systemic infection. Lesions are at risk of bacterial infection, commonly by staphylococcus bacteria which causes an itchy (pruritis), crusty lesion which is usually extremely painful - a condition known as pyoderma. This is often associated with damp skin, poor grooming and contact with blankets, harnesses or cart equipment, particularly if the animal is sweating and the equipment is dirty¹.

- A compromised immune system caused by extended periods of stress and/or poor nutrition will reduce the animal's ability to fight infection.
- Lesions can attract blowflies and screw-worm flies which lay their eggs in the wound. Maggots hatch from the eggs and invade the animal's living tissue, causing irritation and pain as they move around and burrow into the tissue. The larvae of the screw-worm fly cause very serious lesions and untreated cases may be fatal².



Body lesions on the withers / spine.

Possible causation

Working equipment

- Poorly constructed, poorly fitting or poorly maintained harness, pack and cart equipment cause friction and pressure on the skin, which over time causes lesions.
- Poor hygiene, i.e. dirty, wet skin and dirty equipment increases friction and also the likelihood that lesions will become infected.
- Badly made or poorly maintained harnesses can also break during work and cause a serious accident/injury to both the animal, user and others.
- The following body areas are particularly prone to harness-related lesions: breast/shoulder, withers/spine, girth/belly, tail/tail base.

¹ Brooke (2013)

² Hayes (1992)

Beating and other human causes

- Work-related lesions may be caused by the handler or driver whipping or beating the animal. These lesions are commonly found on the hindquarters, gaskins (upper thigh), male genitals and flanks.
- Whipping causes pain and fear and is evidence of underlying problems such as poor handling technique, inadequate training (i.e. the animal not understanding what is being asked of it), or poor nutrition or lameness causing tiredness or lack of energy.
- Aggressive riding practices may also cause lesions on the flanks, due to the rider's heels or spurs.
- When the noseband material is hard, e.g. chains or spikes are used over the nose, this often results in lesions or deformity due to rough handling.



Whipping lesion on genitals.



Knee lesions indicating a fall.

Falls and accidents

- Lesions on the knees indicate the animal has suffered a fall. This could be due to uneven terrain, exhaustion, poor hoof shape, lameness, hobbling, or being made to work too quickly, amongst other causes.
- Falls may also cause lesions on the head or shoulders if they make contact with the ground.
- Collision with vehicles or obstacles in the working environment is a common cause of lesions on the limbs and trunk of the body.
- Lesions are commonly caused by hazards in the work or rest environment, such as nails, wire, broken glass, scrap metal etc.

Fungal infection

- *Dermatophytosis* (known as 'ringworm' although the condition is fungal, not parasitic) presents as scattered, circular, superficial skin lesions which will become crusty if left untreated.
- It is usually itchy and affected animals will often rub against fixed objects which then become a source of re-infection, and a cause of further abrasive lesions. Ringworm can also be transferred to humans and other animals by direct contact or via infected equipment³.
- *Dermatophilosis* ('mud fever' or 'greasy heel') is commonly found on the caudal pasterns⁴.

The condition is made worse by moisture and abrasion and is characterised by inflamed skin with tufted hair and crusted scabs. If the infection worsens, the skin can develop deep cracks or fissures (cracked heels) and the animal may become lame.

Other animals

- Injuries can occur from fighting with other equids, caused by kicks or bites, particularly between stallions, by females in heat, or animals that do not know each other.
- Equids can also be injured by biting dogs and hyenas, or by horned animals such as cattle or buffalo.

^{3,4} Brooke (2013)

Means of resolution

Prevention

- Regular grooming and washing by the owner or handler helps keep the skin clean and free of sweat and debris, and also provides an opportunity to identify and address lesions at an early stage.
- Ensuring harness and equipment is well fitting and well maintained will reduce harness-related lesions.
- Working with owners and harness makers to encourage the use of padding to raise harness above the withers, and the replacement of chain and twine with softer materials are important to prevent recurrence of harness-related lesions⁵.
- Regularly removing the harness (e.g. during rest breaks) allows air to reach the skin and for the skin to dry, reducing the risk of friction sores. This also has the benefit of allowing the animals more effective rest when not actively working.
- People demanding equids for use (e.g. tourists, taxi service users) should be educated that only animals that are healthy, comfortable and free from lesions should be used for riding or carriage excursions, therefore increasing the incentive for owners/users to reduce lesions.
- Maintaining healthy body condition reduces the risk of lesions, as there is less natural padding on the animal's body.
- Living and working areas should be regularly checked for such hazards and repairs implemented when required.

- Fighting can be reduced by ensuring all animals have equal access to resources such as food, water and shade. Lower ranking animals may need to be fed and watered separately from more dominant equids to prevent bullying and to ensure they receive a sufficient share of resources.

Treatment

- Hair around the lesion should be clipped (if possible without causing further damage) and cleaned with topical antiseptics. Large lesions may need to be bandaged or covered to protect from flies and further infection.
- Veterinary intervention should be sought for large or deep lesions which may require deep cleaning and suturing. Antibiotics or antifungal treatments may also be required depending on the cause and extent of the lesion.
- If equipment is the cause of the lesions, this must be changed or improved (e.g. with padding) to prevent recurrence.
- Animals with lesions due to infective agents, e.g. ringworm, should be isolated to avoid spread to others; equipment should not be shared.
- Rest period off work.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.



Animal unharnessed at rest.



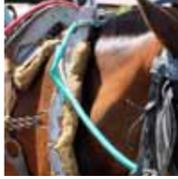
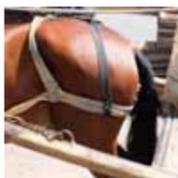
Animal not unharnessed or unloaded to rest.



Ear injury from fighting with other donkeys.

Root Causes of Lesions

The table below illustrates some common locations for lesions along with likely causes and suggested means of resolution:

Area affected	Causation	Means of resolution
Breast and shoulders 	<ul style="list-style-type: none"> ■ Breast plate or neck collar too tight, so sits too high and puts pressure on the chest area/base of windpipe. ■ Breast plate or neck collar too loose, so sits too low moving around and causing friction the chest area. ■ Cart overloaded or two-wheeled cart loaded with the weight behind the axle, causing it to tilt backwards placing additional pressure on the breast plate or neck collar. 	<p>Ensure that the breast plate or neck collar is well fitted and the correct size for the animal. Thin animals or those with narrow chests will benefit from more padding. A narrow or thin breast plate spreads the force over a smaller area is worse because of increasing pressure. Two-wheel carts should always have the weight placed over the axle to ensure they are well balanced and easier for the animal to pull.</p>
Withers 	<ul style="list-style-type: none"> ■ Saddle, pack saddle or harness too large and so there is no clearance of the withers. ■ Saddle, pack saddle or harness too small, causing pinching of the withers. ■ Load too heavy, causing the saddle or pack saddle to press onto the animal's back. ■ Equids with a low body condition score will have more prominent withers that rub against the saddle or harness. ■ Muscle wastage in the back/shoulder area due to lameness or will make the withers more prominent. ■ Saddle or harness placed too far forward on the animal's back, causing contact with the withers. 	<p>Ensure that the saddle, pack saddle or harness is well fitting, of the correct size for the animal and is correctly fitted when saddling/harnessing. If the load is so heavy it causes a well-fitting saddle to press into the animal's back, the load should be reduced. Correct feeding for the animal's type and workload will help to maintain body condition, whilst recognising and treating lameness early will help avoid muscle wastage (see the <i>Body condition and Lameness</i> sections for more details).</p>
Girth and belly 	<ul style="list-style-type: none"> ■ Home-made girths such as rope, chain, twine, etc. cause friction. ■ Girth over-tightened in an attempt to make a poorly fitting saddle stay in place. ■ Sweating increases friction in the girth area. ■ Cart shafts too narrow causing friction against the animal's sides. 	<p>Ensure that girths are well made, well maintained and of the correct size for the animal. Girths should be made from smooth, flat leather or webbing and should lie flat against the animal's skin. The narrower the girth, the more pressure is placed on the animal's skin so a wider girth or one with more padding can reduce pressure and be more comfortable. Keeping harnesses clean and supple will reduce friction and make it more comfortable for the animal to wear. Daily grooming and washing of the animal will remove sweat and dirt that can cause the harness to rub. Ensure that the cart is the correct size for the animal.</p>
Hind quarters 	<ul style="list-style-type: none"> ■ The breeching strap runs around the hind quarters of the animal across the buttocks. A breeching strap that is too tight will cause pressure, whilst one that is too loose will cause friction and not function effectively. ■ Equids with a low body condition score will have thinner hind quarters with pointed buttocks, which rub against the harness. ■ Muscle wastage in the hind quarters due to lameness or will make the breeching strap too loose. ■ Other lesions in this area can be caused by the driver/handler whipping, beating or poking the animal. 	<p>Breeching straps are essential to prevent the cart running into the back of the animal causing injury, so should not be removed, but need to be well fitted and well maintained. Correct feeding for the animal's type and workload will help to maintain body condition, whilst recognising and treating lameness early will help avoid muscle wastage (see the <i>Body condition and Lameness</i> sections for more details). Improving the animal's condition will increase its energy and work ability, which may reduce prodding/whipping by owners/users, as can improving driving technique.</p>

⁵ Brooke (2013)

Area affected	Causation	Means of resolution
<p>Tail and tail base</p> 	<ul style="list-style-type: none"> ■ The crupper has a loop which the tail passes through. Its purpose is to prevent the saddle or harness from slipping forwards along the animal's back. ■ A crupper with a loop that is too tight for the tail to fit through comfortably will rub. One study found that the most severe lesions were associated with more padded straps and that cotton straps caused worse lesions than synthetic ones⁶. ■ A crupper that is too short will pull on the base of the tail causing pressure and friction. ■ Home-made cruppers made from rope or twine will increase pressure and friction causing damage to the skin. ■ Faeces, urine, sweat and dirt can build up in the crupper area under the tail increasing friction and causing any lesion present to become infected. ■ The presence of ticks under the tail can increase the skin's sensitivity to friction from the crupper. Also, the crupper rubbing off attached ticks leaving the mouth parts behind can cause a lesion and/or infection to develop under the tail. 	<p>Cruppers should not be used as an alternative to a well-fitting saddle or harness. If used, they should be of the correct size for the animal and should be well made and maintained. Keeping harness clean and supple will reduce friction and make it more comfortable for the animal to wear. Daily grooming and washing of the animal will remove sweat and dirt that can cause the harness to rub. Regular inspection and removal of ticks will benefit the animal (see the <i>Ectoparasites: ticks</i> section for more details). The owner/handler should regularly check under the tail for signs of developing lesions.</p>

Animal Health

Lip Lesions

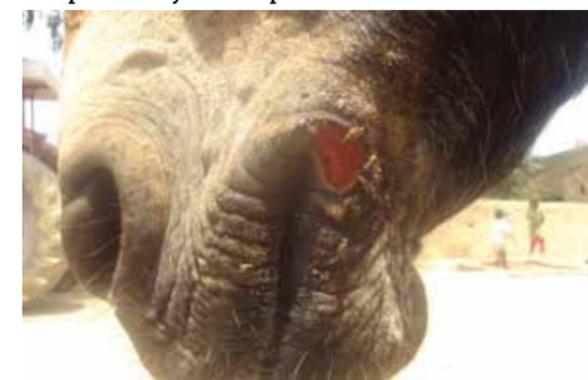
SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Lip Lesions

Welfare issue

- The animal displays lesions in the corners (commissures) of the mouth on one or both sides.
- These lesions are usually caused by the bit placed in the animal's mouth, which is attached to the bridle and reins, and used to control the animal during riding or driving.
- Bit injuries will show as rubbed (abrasions), pinches, or tears (lacerations) and will be located in the corners of the mouth. Other injuries in this area may be caused if the animal has eaten a caustic substance; however, these can be differentiated as burns and/or blisters and are likely to also appear on the tongue. The animal may also injure the lips by accidental laceration, e.g. if falling and scratching the head on the ground; these lesions are unlikely to be located specifically at the lip corners.



Lesion at the commissure of the lips.

Welfare significance

- Equids have sensitive mouths and lips, therefore abrasions or lacerations in the corners of the mouth are likely to be very painful.
- Bit-related oral damage is often not only the visible lip lesions in the corners of the mouth but may also include bruising or lesions on the gums, palate and tongue, which will be more difficult to see. Therefore, lip lesions are likely to be an under-estimation of the true extent of bit-related injury to working equids. Damage to the mouth caused by the bit can become permanent¹.
- Bits with a severe curb (long shanks designed to increase the leverage exerted on the animal's mouth) can even lacerate the tongue². It is important to remember that the more damage is done to the animal's mouth, the less responsive the animal will eventually become during riding/driving, as scar tissue is less sensitive than normal tissue. This can be misinterpreted as stubbornness or bad behaviour and increase the rider/driver's frustration leading to rough handling and cruelty.
- Oral pain can inhibit the animal from eating and drinking normally, particularly if the pain is severe or chronic. This may reduce the animal's ability to eat and drink, potentially leading to a loss of condition³, dehydration or colic in addition to continued pain and suffering.
- Worsening pain and delayed healing of lesions is likely to occur if owners continue to work the animals with a bit in the mouth before oral wounds have completely healed. In some cases, even after wound healing, there may be continued discomfort.
- Pain in the mouth is likely to have behavioural effects on the animal, such as showing reluctance to be bridled, becoming head-shy, throwing the head up when pressure is applied to the reins, opening the mouth (yawing), headshaking or holding the bit between the teeth⁴.
- Some of these behavioural responses may trigger negative reactions from the owner, as they may interpret that the animal is being 'naughty'. This could lead to increased aggressive handling interactions.

⁶ Burn et al (2008) quoted in Brooke (2013)

^{1,2,4} Anderson (2005)

³ Brooke (2013)

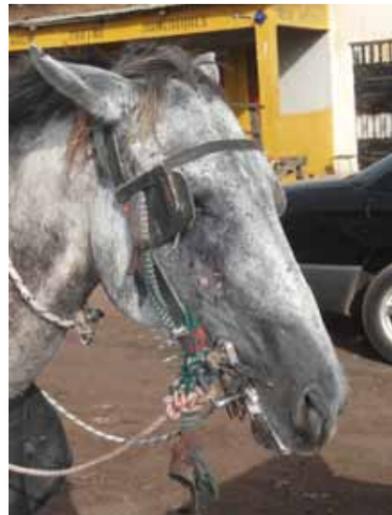
Possible causation

Rough handling/driving

- The animal's mouth can be damaged accidentally through poor technique such as a rider using the reins for balance, or pulling harshly on the reins when driving.
- Sometimes deliberate abuse can occur from rough handling as a result of anger or frustration with the animal, and the rider/driver may deliberately pull on the reins sharply to 'punish' the animal.
- Equines naturally run away from painful/fearful stimuli (the flight response), this means that an equine experiencing pain the mouth may well be prone to bolting or become difficult to stop. Unfortunately, this will often result in greater pressure being applied to the reins by the owner, causing more pain. Conversely, some animals may become reluctant to go forward, which could result in the rider/handler whipping the animal to make it go forward.
- Home-made bits made from materials such as wire, chain or nylon will do a great deal of damage to the animal's mouth as the thin wire or rope will increase the pressure on the sensitive tissue of the mouth, whilst a chain will increase friction and cause bruising.
- Bits made of iron will rust, whilst materials such as nickel or plastic will wear away creating sharp edges which can easily cause lesions.
- Bits with loose rings may nip, either if they are too narrow or the equid has thick, fleshy lips. In these instances fixed rings may be better.
- Studies have shown that jointed bits are more likely to be associated with lesions than straight-bar bits⁵.
- A study in Lesotho found that curb bits were the most common bit type in the area and that these were regularly found to be too large and/or fitted too low, risking injury to the mouth⁶. In many cases the bridles and bits (and other harness) were found to be ill-fitting, dirty and in poor condition.

Bit type and fit

- The materials used to make the bit, the quality of workmanship and condition are important. Sharp edges, rough surfaces, or a bit that is too thin will easily damage the mouth. A bit that is too narrow will pinch the lips creating lesions, and cheek pieces that are too tight will cause the bit to be positioned too high in the mouth.
- A more severe bit (e.g. a thin bit, a jointed bit, or one with a curb action) is more likely to cause injury in the wrong hands compared to a thicker, straight bit.



Badly fitting, uncomfortable bit.



Severe, uncomfortable bit, likely to cause pain and damage to the mouth.



⁵ Brooke (2013)

⁶ Upjohn (2011)

Means of resolution

- The use of well-made, well-fitting bits should be encouraged.
- Bits should be made of smooth stainless steel or smooth rubber (although commercially-made bits in other materials such as iron, copper and plastic are available). Soft materials that will wear away quickly and develop sharp edges should be avoided.
- Bits should never be made from materials such as chain or wire, which will damage the mouth.
- Whatever material the bit is made from, it should be inspected regularly for wear and tear, including sharp edges, cracks, damage, and thin areas which could cause injury or cause the bit to break.
- The fit of the bit should be checked to ensure it is not too large, too small or too bulky for the animal's mouth.
- The fit of the bridle is also important. If the bit is too high it will injure the corners of the mouth, but if too low it will hit against the teeth and cause discomfort.
- The bit should be removed during rest so that the animal can eat, drink and rest without the bit in its mouth. This will also give the lips and mouth time to rest and give the handler the opportunity to check the lips for early signs of injury.
- Bits must be cleaned frequently. When the bit is removed it should be rinsed to remove saliva and food debris which will increase friction on the lips causing sores.
- Riders and drivers should be educated to handle the reins gently so as not to injure the animal's mouth. Training could be offered to improve handling, riding and driving. Equids should not be tied by the reins in case of injury if the animal moves suddenly.
- Involving the whole community of relevant stakeholders, including harness and bit makers as well as owners is important to improve bit selection, fit and maintenance⁷.
- Applying ointment to the lip lesions is not an adequate means of resolution and may be counter-productive as the owner may perceive this as a cure and not adjust the bit. Ointment will have no effect on the lesions as it is likely to be licked off immediately and topical applications containing steroids will actually delay healing.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.



Animal with bridle and harnessing removed to enable more comfortable resting during work.

⁷ Brooke (2013)

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Interference Gait

Welfare issue

- The equid displays signs of interference injuries to any of the lower limbs.
- The severity of the injury can range from rubbed hair to a large and severe lesion. Even where the skin is not broken, interference injuries can cause bruising, pain and swelling, particularly to the fetlock joint. Over time, this can lead to degeneration of the joint and long term lameness.
- Brushing (interference) lesions are due to contact between the hoof and adjacent limb during motion. They are typically located on the inner sides of the fetlocks, on fore or hind limbs.
- Over-reaching lesions are due to contact between the toes of the hind hooves and the heels of the fore hooves. They are typically located on the heels of the fore limbs, and are not present on the hind limbs.
- *Note:* There are other types of interference between limbs, but only those from brushing and over-reaching are captured during SEBWAT due to being simple to recognise and assess.



Interference looks like repeatedly struck at same site over long time. Top: brushing interference lesion, bottom: over-reaching interference lesion.



Severe (brushing) interference lesion.



Mild (brushing) interference lesion.

Welfare significance

- Interference lesions are painful and uncomfortable to the animal during work, and can present as lacerations, bruising, swelling and bone or tendon damage. As interference injuries tend to occur repeatedly in the same location, over time they can lead to degeneration of the affected joint (usually the fetlock) and the development of osteoarthritis, leading to chronic pain and lameness.
- Like any lesion, interference lesions are a risk of local or systemic infection to the animal. Their location on the lower limbs means that they are close to the ground and therefore may be susceptible to infection due to increased contact with mud, soil, urine, faecal material etc. When soil contamination occurs there is a high risk of tetanus.
- Interference lesions indicate that the animal's gait may be compromised in some way, and it is experiencing difficulty working without collision between limbs.
- Collision between limbs increases the risk of tripping and falling during work. This is a particular concern for animals carrying heavy loads, as falls can result in serious injury, as well as fear and distress.
- Over-reaching injuries can be slow to heal as the pastern is a very mobile area and the wound can be pulled open as the animal moves. Affected animals should be rested with restricted movement until the wound has healed, as slow healing can lead to the development of granulation tissue (proud flesh).
- Proud flesh in the pastern area can resemble a tumour, particularly if it grows larger than the original injury, and can be difficult to manage².
- Equids prone to over-reaching are more likely to pull off their front shoes by stepping on the back of the shoe with the hind hooves. This can damage the hoof wall causing cracks, and increase the risk of falls.

Speedy-cutting

- A speedy cut is similar to a brushing injury but the point of contact is higher on the limb, e.g. closer to the knee or hock, rather than on the fetlock area.
- As the name suggests, speedy cuts occur in equids working at speed (moving fast) and can be very serious, particularly if the horse is shod as the edge of the shoe acts like a knife against the soft tissue of the opposite leg. Speedy cuts can result in serious lacerations and tendon damage.

Over-reaching

- Over-reaching injuries can be deep, particularly if the animal is shod on the hind limbs. These injuries can bleed a lot as the skin in the fetlock area is delicate, and the lack of protective fat or muscle means that there is a risk that the underlying structures of the pastern (bone, tendon or arteries) can be damaged.
- It is also possible for the hoof wall or the coronary band to become damaged by over-reaching. As the hoof grows from the coronary band downwards, damage in this area can take several months to grow out, and can lead to slow or abnormal hoof wall growth which may cause long-term lameness¹. (See the *Hoof shape and quality* section for more information on hoof abnormalities).

¹ Dabareiner quoted in Raia (2010)

² Cable (2001)

Possible causation

- Exhaustion and debility increase the risk of limb collision as animals are less able to move normally due to muscle weakness and fatigue. Exhaustion and debility can have many causes, including dehydration, pain, over-work, under-nutrition and disease.
- Working at speed, (e.g. pulling a cart) increases the risk of collision occurring between the limbs, and also increases the likelihood that collision will result in a lesion due to limbs moving with greater force at faster speeds³. Over-reaching and speedy-cutting are both often associated with fast work.
- Poor farriery is a major cause of interference lesions, particularly due to protruding nails on the inner surfaces of the hoof wall, loose shoes, offset or crooked shoes, shoes that are too wide for the hoof, poor quality shoes that break or crack easily, etc.
- The presence of shoes can increase risk of interference lesions due to the additional weight they add to the hoof, and sharp or abrasive materials used for shoes, making it more likely that collision with the hoof or shoe will result in an injury to the limb.
- Poor hoof shape has severe effects on an animal's motion, inhibiting the animal's ability to move freely and comfortably, making limb collision and interference lesions more likely.
- Overgrown fore hooves have a delayed break-over point, as it takes longer for them to be lifted from the ground than if they were the correct shape⁴. This increases the risk of over-reaching, as the hind limbs may strike the heels of the fore limbs before they break over.
- Factors that slow the movement of the fore hooves also make over-reaching more likely. These include deep or muddy ground, lameness in a forelimb (causing a shortened stride) or tiredness, leading to a lack of coordination.
- Poor conformation can predispose to interference during motion, for example, equids with narrow chests are more likely to suffer brushing injuries as their limbs are closer together and more likely to collide during motion⁵; and toe-out conformation causes limbs to move in an arc rather than in a straight lateral motion.



Very poor shoeing, causing risk of lesions to other limbs and hoof damage.



Very poor hoof shape and (brushing) interference lesion on the right limb.

Means of resolution

- Any lesions should be cleaned and covered to reduce risk of infection. Treatment must be coupled with preventative measures, otherwise the lesion will continually recur as the animal strikes the same site again during work.
- Preventative measures can be taken to avoid repeated injury to the interference site. These include bandaging to protect the heels or fetlocks; 'doughnut' devices which inhibit close contact between the limbs; brushing boots or over-reaching boots if available in the context, or local alternatives. These measures are particularly important to promote in animals known to have conformation that predisposes to interference, as other means of resolution may not be successful in such cases.
- Maintaining correct hoof shape and balance is important to support free and comfortable limb motion during work. (See the *Hoof shape and quality* section for further information about other benefits of maintaining correct hoof shape.)
- Shoes should be avoided if not essential for the working conditions of the animal.
- If shod, nail clenches must be neatly turned down and flush against the hoof wall. Shoes must be the correct size for the specific hoof, and should not protrude beyond the hoof wall.
- Corrective farriery can help reduce interference problems by improving the hoof balance. Reducing toe length and squaring off the hind toes (known as 'rolling the toes') can improve 'break over' and reduce incidences of over-reaching, although care must be taken to ensure that too much toe is not removed or pain and lameness will result. It is important that owners are aware that corrective farriery is a long term process and will require multiple trims over many months to get a correct hoof shape, and requires a skilled farrier.
- Owners should be educated about the benefits of avoiding working animals in a state of exhaustion or debility and encouraged not to work at fast speeds whenever possible. (See *Apathy* section for further information on means of resolution for apathetic or debilitated animals.)
- Adequate rest and feed can prevent accidents and injury caused by exhaustion or lack of energy.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention..



Clenches not flush with the hoof - risk of injury to adjacent limb when this is on medial aspect.

³ Thal, D.O. (2015)

^{4,5} O'Grady (2003)

⁷ Wilson (date unknown)

⁸ Hayes (1992)

⁹ A. Brown, personal communication.

¹⁰ Brooke (2013)

Animal Health

Lameness



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Gait

Welfare issue

- Equid displays signs of lameness in one or more limb/s.
- Studies show that lameness is highly prevalent in working horses and donkeys in the developing world¹, with a high proportion suffering from lameness in more than one limb. Data suggest that almost all working equids show gait abnormalities of some sort².



Horse resting a forelimb which indicates lameness.

Welfare significance

Pain

- Pain in the spine, limbs or hooves causes lameness, as the animal adopts an abnormal gait in an attempt to reduce the pain it is experiencing.
- This will lead to further damage to joints, muscles and tendons if not corrected, due to the forces created by the abnormality being transferred through other areas of the musculoskeletal system³. Musculo-skeletal asymmetry can also be the result of neurological disorders. If the nerve has been damaged then the muscle is no longer activated and atrophies.
- Chronic pain can also lead to the development of secondary problems, including a suppressed immune system which reduces the ability to fight infection; disturbed rest or loss of appetite leading to loss of condition; and the animal becoming increasingly withdrawn and depressed until ultimately an apathetic state is reached.
- If the lameness is chronic or subtle the owner may not notice anything wrong⁴ and continue to work the animal normally causing persistent pain and suffering, and perhaps worsening the underlying cause of lameness.

Reduced working ability and productivity

- A lame equid will work inefficiently compared to a sound equid. This means that the lame animal will tire more quickly and be less able to cope with heavy loads or long hours.
- Reduced working ability could lead to increased negative interaction from owners during work (e.g. beating, whipping, shouting).
- Days off work for recovery may reduce the owner's income, making it more difficult to afford feed and veterinary medicine to treat the lameness and return the animal to full productivity.
- If lameness is left untreated, the animal's productivity may further decline, ultimately to the point where it becomes uneconomical to keep the animal, creating a risk of neglect or abandonment.

Reduced body condition score

- Studies have found a link between lameness and low body condition score⁵. This could be due to the lame animal expending more energy with each stride compared to a sound animal, therefore without additional feeding there will be an energy deficit resulting in a loss of body condition.
- Alternatively, lameness can be a mechanical consequence of poor body condition, because malnutrition has inhibited the development of a strong, sound musculoskeletal system when the animal was young.

Conformational problems

- Long-term untreated lameness can cause atrophy of some muscles, leading to asymmetry in the animal's skeleton or musculature (i.e. differences in one side of the body compared to the other, e.g. uneven muscle development on left and right shoulders, or one hip joint higher than the other).
- Musculo-skeletal asymmetry can also suggest poor nutrition and/or overwork at a young age whilst the animal was still growing⁶, making the adult animal more susceptible to lameness.
- Lameness is also often associated with multiple pathological abnormalities within each limb, with chronic hoof pathology particularly common⁷. This means that when working equids have abnormal conformation of the hooves or limbs they are more likely to experience painful lameness and therefore reduced productivity.
- Consideration should be given as to the wisdom and ethics of breeding from equids showing abnormal hoof or limb conformation, as such abnormalities are often hereditary and therefore offspring are likely to suffer too.



Equid displaying both low body condition and fore limb lameness.



Examples of abnormal conformation of hooves or legs.

¹ Broster et al (2009)

² Pritchard et al (2005) quoted in the Brooke veterinary manual (2013)

^{3,4} The Brooke (2013)

⁵ Pritchard et al (2005) quoted in Broster (2009)

⁶ Reix et al (2014)

⁷ Broster et al (2009)

Possible causation

The reasons for lameness are manifold and cases are often a result of multiple factors. Common causes include:

- Poor farriery - e.g. hoof imbalance, toes too short/too long, poor quality and/or fit of shoes, iatrogenic injury by farrier.
- Poor conformation of limbs - e.g., misaligned joints in limbs leading to uneven weight distribution throughout the limb.
- Poor conformation of hooves - e.g. dropped or flat soles leading to increased sensitivity to stones and rough ground.
- Injury to the hoof or limb - e.g. sole puncture, damaged tendon.
- Infection or disease of the hoof or limb - e.g. canker, tendonitis.
- Spinal pain and stiffness - significantly associated with lameness⁸. This spinal pain can be associated with overwork, overloading, and poorly designed carts and harness.
- Overwork, fast work, work on rough ground - can cause bruising of the sole and twists/sprains to the joints. Likelihood of injury at speed or on rough terrain can be increased by some hoof abnormalities, e.g. dropped/flat soles, upright "boxy" feet or broken hoof pastern axes.
- Exhaustion - increase the risk of stumbling, falls and interference injuries, particularly if the animal already has a conformational tendency towards interference.
- Malnutrition - leading to poor quality hoof horn, causing weak and brittle hooves which are prone to cracks.

See the [Hooves and Farriery](#) summary for further information about hoof-related welfare issues.

Lameness associated with draught work

- More severe lameness in the hind limbs compared with the forelimbs has been reported as being associated with draught animals⁹. This was found in both draught horses and donkeys and is considered to be due to the propulsion required to set a heavy cart in motion.
- This effect is intensified by the weight of the cart causing a caudal (backward) shift in the centre of balance for an animal hitched to a cart. This is worsened when the cart has only two wheels and the weight is loaded behind the wheels.



Example of overwork which could cause lameness

Means of resolution

- Over the long-term, reducing the potential causal factors identified above should reduce the prevalence and severity of lameness in the working equine population.
- The specific means of resolution for individual cases will depend on the cause and extent of the lameness, and requires veterinary assessment. Sometimes the precise cause of the lameness cannot be identified and so the condition must be treated symptomatically.
- The primary requirement for the treatment of lameness is rest; however, this can be difficult or impossible for owners of working equids to provide¹⁰.
- When deciding on a treatment for lameness it must be considered whether the animal can be returned to a pain-free state. A veterinary assessment of whether the animal can return to work should be carried out in discussion with the owner. If the owner is able to support the animal with a reduced workload and/or shorter working hours, perhaps with the support of analgesics, a return to work may be possible. If the owner cannot provide this support or the degree of pain from the lameness is too severe, euthanasia may need to be explored to avoid further suffering.
- Good quality regular farriery.
- Not starting work at a young age.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

Animal Health

Hoof shape and quality

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Hoof shape (fore and hind)
Hoof horn quality (fore and hind)
Swelling

Welfare issue

- The animal displays poor hoof shape or quality, including hooves that are too long or too short, cracks or breakage of the hoof wall, or mismatched pairs of hooves.



Conformation of hoof.

Welfare significance

- The hoof is a complex structure made up of three bones supported by tendons, ligaments, cartilage, and other detailed structures.
- It is important to remember that the full weight of the animal is supported on these four, relatively small feet, so any problems with the hooves have major repercussions for the overall welfare of the animal, and on ability to work comfortably. Remember: 'No foot, no horse!'
- Chronic hoof pathology is very common in working equids¹.
- When equids have abnormal hoof conformation they are more likely to experience painful lameness and therefore reduced productivity and poor mental state. For example, an animal with thin or dropped soles will find working on stony or uneven ground very painful as there will

be contact between the ground surface and the sensitive sole of the hoof.

- Uneven loading of the hoof due to poor trimming has repercussions for the entire limb. The forces will be transferred unevenly up the rest of the limb, which will put increased strain on joints, tendons and muscles² leading to fatigue and injury.
- Long term hoof abnormalities can lead to chronic lameness and irreversible arthritis for the animal (see the [Lameness](#) section for more information).
- Many secondary problems originate in the hooves, such as lower limb swelling, tripping or falling, spinal pain, lameness, and interference lesions.



Bad hoof shape - broken back of the hoof.



Badly contracted heels - frog unable to function.

^{8,9} Reix et al (2014) ¹⁰ Brooke (2013)

¹ Broster et al. (2009)

² Brooke (2013)

Donkey and mule hooves

- Horse hooves should have an angle of approximately 45-50° in the fore hooves and 50-55° in the hind, and the wall at the heels should be approximately half the length of the wall at the toes.
- Donkey hooves are smaller and have a more 'box-like' appearance than horse hooves. The hoof wall is naturally more upright.
- Little information is available on mule hooves, however texts suggest that they should be cared for similarly to donkey hooves³.



Donkey hoof.



Mule hoof.

Possible causation

- Hoof problems and poor trimming techniques can both be linked to a lack of understanding of the structures of the foot and how forces are transferred from the foot up the limb⁴. See the Brooke Veterinary Manual⁵ and the Farriery Quality Monitoring Tool for further information on the anatomy and conformation of the hoof.
- Poor conformation, e.g. dropped or flat soles, can lead to increased sensitivity to stones and rough ground. Weak conformation can be exacerbated by poor hoof shape.
- Poor hoof hygiene can lead to infection or disease of the hoof, e.g. thrush, canker.

Nutrition

- Good hoof quality comes from good nutrition, combined with regular and effective hoof trimming⁶.
- Poor nutrition can lead to brittle hooves which are prone to cracks and breakage. This can lead to further problems, such as abscesses, where infection has entered the hoof capsule through a crack, or lameness.
- Malnutrition can also slow the rate of horn growth, making it take longer for defects to grow out.
- Shod equids with brittle hooves will also lose their shoes more easily, causing further damage to the hoof wall.



Poor hoof quality.



Horizontal crack.

Shoes

- The decision of whether to shoe the equid depends on several factors including the animal's type of work, the ground conditions, and the quality of the hoof horn.
- Ideally the hoof should grow at the same rate as it is worn away, however, if the rate of wear will exceed the rate of growth, the hoof will be worn away unless shoes are fitted⁷. The rate of wear will be increased if the animal is working on hard, abrasive surfaces.
- Once shoes are fitted, the hooves will require regular trimming to prevent the hoof growing too long, since it can no longer wear down naturally.
- Long, overgrown hooves increase the strain on the tendons, cause tripping and stumbling, and will increase the risk of interference injuries by causing the animal to over-reach.
- Shoes that are the wrong size, worn or broken can damage the hooves and cause lameness. Shoes that are too narrow at the heel will cause bruising and corns.
- The action of nailing on a shoe can cause pain if the nails are too close to the sensitive internal structures (nail bind) or if the nail pierces one of these structures (nail prick). Nail bind is more likely if the animal has thin hoof walls⁸.
- In the working equine context, those animals without shoes almost always have hooves in better condition than those with shoes, because farriery is a very highly skilled task, and is so often done badly⁹.
- Home-made shoes and home-trimming of the hooves by untrained owners, or farriers can cause or exacerbate hoof problems.



Clenches not flush with the hoof - risk of injury to adjacent limb when this is on medial (inside) aspect.



Brittle hooves, cracked due to nailing.



Sharp edge on shoe (middle) and bad hoof shape, broken forward.

Means of resolution

- Correct trimming and balancing is essential to ensure that the hoof hits the ground correctly at each stride, allowing the forces to be distributed evenly through the foot and limb so that the animal can move efficiently and without pain. It can take more than a year for hoof horn to grow from the coronary band to the ground, so it is important to understand that corrective farriery is not a quick process and problems cannot be rectified in just one trim¹⁰.
- Owners should be encouraged to invest in a trained farrier, as this investment will be recouped many times through a more productive animal.
- Owners should be encouraged to clean hooves daily, and check for any abnormalities or injuries.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention..

^{3,5} Brooke (2013)

^{4,6} Wilson (date unknown)

⁷ Wilson (date unknown)

⁸ Hayes (1992)

⁹ A. Brown, personal communication.

¹⁰ Brooke (2013)

Animal Health

Frog disease

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Frog Gait

Welfare issue

- The animal has evidence of disease of the frog in one or more hooves.
- This may include discharge from the frog or associated structures, thrush or canker.
- *Note:* in SEBWAT, only the fore hooves are assessed for practical reasons; therefore prevalence of frog disease is likely to be underestimated.

Welfare significance

- The frog acts as part of the shock-absorbing mechanism of the foot. When the equine hoof touches the ground during motion, the frog should be in contact with the ground. This should be true, with or without, shoes.
- Poor hoof shape, or disease, damage or removal of the frog will prevent this happening, thus severely disrupt the normal functioning of the hoof.
- If the frog does not make contact with the ground, the shock of impact will be transferred upwards through the hoof wall into the limb, which can lead to jarring.
- The frog also has an important role to play in promoting healthy blood circulation around the equine foot, which can also be disrupted if normal ground contact is prevented.
- Frog abnormality can be both a cause and a consequence of poor hoof shape and structure. A frog that is unable to function correctly may lead to abnormal hoof functioning, affecting growth and conformation, e.g. contracted heels. Conversely, a poorly-shaped hoof may prevent the frog from functioning normally.



No disease of frog.

Possible causation

- Thrush is a common degenerative bacterial infection characterised by a distinctive black, foul-smelling discharge in the central sulcus and collateral grooves. If left untreated the infection can affect the sensitive structures, eventually causing lameness.
- Canker is a bacterial infection which causes overgrowth of some parts of the hoof tissues, typically around the frog sulci and heel bulbs. Like thrush, it is characterised by a foul-smelling pus-like discharge. Canker often recurs, and therefore can require long-term treatment to resolve.
- Penetrating injury to the frog (e.g. from standing on a nail) can be serious, and lead to infection of the internal structures. If veterinary attention is not sought at an early stage, this can progress to be untreatable and the animal may have to be euthanased¹.
- Sometimes, service providers who are poorly trained and do not understand the structure and function of the equine hoof may excessively trim, or even remove the frog during hoof trimming. This is unacceptable practice, and both owners and hoof trimmers should be educated about the function and health of the frog.



Bloody discharge from frog.



Frog completely eroded.



Thrush of the frog.

Means of resolution

- Thrush and canker are often caused by with poor hoof hygiene. The importance of daily cleaning of the hooves with the correct use of a hoof pick should be promoted to owners.
- The hygiene of underfoot surfaces is important to prevent frog infection. Underfoot surfaces in resting areas should be dry and clean. Faeces and urine-soiled materials should be removed frequently to avoid creating an environment that encourages bacteria to thrive, including those which infect the frog.
- Equids should have ample opportunity to walk around, as locomotion promotes healthy blood circulation in the hoof. Animals who spend long periods of time standing in dirty stables, or mud, are particularly prone to infection of the frog.
- Correct and regular hoof trimming is essential to maintain a good hoof shape, which supports a healthy frog.



Owner learning how to clean hoof for the first time.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

Animal Behaviour

Apathy



Comparison between apathetic and resting posture.



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Observer approach

Chin contact

Tail tuck (donkeys only)

General attitude

Welfare issue

- The animal appears lethargic and unresponsive to external stimuli such as approach by or contact with the handler or other animals.
- An apparently apathetic animal should be observed closely to establish genuine apathy as opposed to resting, sleeping or simply being relaxed/unconcerned, since equids are able to sleep standing up. However, if the animal is unresponsive to its surroundings, interactions with the handler, and to any physical contact, this suggests apathy. A non-apatetic, alert animal should display some reaction or interest in the handling process and its surroundings.
- An apathetic animal should be considered of as much concern as those showing more overt behavioural problems, as the causes can be equally significant to welfare.¹

Welfare significance

- An apathetic state is an important indication that the animal's welfare is compromised in some way, and should never be ignored.
- Apathy can be a sign of a range of problems² which could include:
 - Illness
 - Exhaustion
 - Chronic pain
 - Lethargy or depression
 - Dehydration or severe electrolyte imbalance
- When apathy is a response to poor handling, there is a danger that it can be misconstrued by the owner as acquiescence. As the animal becomes more and more unresponsive to stimuli, even when this has been increased, the owner may believe that the animal has "learned its lesson" because the desired outcome (i.e. a submissive animal) has been achieved.
- Dullness and depression is commonly reported as the only observable behaviour change caused by abdominal pain in donkeys³. The more subtle pain indicators shown by donkeys can often be missed meaning that opportunities to treat problems can be delayed or overlooked altogether. Donkeys with unrecognised chronic pain can become increasingly withdrawn until an unresponsive, depressive-like state is reached.

¹ Hall, et al (2008)

² Burn et al (2010)

³ Brooke Veterinary Manual (2013 edition)

Possible causation

Illness/exhaustion

- The body's attempt to fight disease or infection will reduce overall energy levels, producing a lethargic or withdrawn appearance. The body's resources are diverted towards the most important systems (e.g. the immune system) at the cost of reduced vigilance and maintenance behaviours such as eating and grooming.
- The acute phase of a bacterial or viral infection is a primary cause of lethargy⁴. Possible causes in the Brooke context could include equine influenza, trypanosomiasis (Surra), strangles, glanders.
- Diarrhoea is a symptom of some types of infection and can lead to dehydration and severe electrolyte imbalance, which further contribute to lethargy.
- A reduced appetite, associated with some illnesses, will lead to further loss of condition as energy used during work or to fight illness is not adequately replaced.
- Depleted energy reserves due to over-work and exhaustion lead to the animal becoming correspondingly less responsive.
- Apathy and unresponsiveness have been found to be associated with a lower body condition score, older age and other health problems⁵. Animals with a body condition score of 2 were twice as likely to be apathetic as those with a score of 3.

Dehydration

- A severely dehydrated animal is likely to present an apathetic appearance.
- Chronic dehydration can lead to problems including constipation, colic, lack of energy/poor recovery rates, tissue damage and delayed wound healing.

Rough and inconsistent handling

- If the outcome of every attempt to obey a handling command is met with a punishment response from the handler (even if this is accidental e.g. due to poor driving technique) then the animal will become increasingly unresponsive to these commands.
- The animal may not understand what is being asked and consequently cannot predict whether or not any 'punishment' is to be expected.
- When the animal has learned that it has no control over unpleasant or harmful conditions it will give up trying, i.e. it will enter a state of "learned helplessness" characterised by increasing lethargy and apathy.

Pain/discomfort

- If every attempt to relieve pain or discomfort is unsuccessful, for example, being punished for attempting to avoid the pain of ill-fitting harness, then again the animal can eventually become increasingly apathetic.
- Protective behaviour aimed at reducing pain, such as reduced mobility and a decrease in normal activity, can be observed as lethargy and unwillingness to interact with handlers or other animals.



Horse showing poor body condition and apathetic behaviour.



Donkey showing apathy and head-pressing, suggesting pain.

⁴ The Brooke (2013)

⁵ Burn et al (2010)

Means of resolution

- The means of resolution will depend upon the specific cause of apathy as described above; for example, if due to illness then it is likely that responsiveness will return as the animal recovers.
- Opportunities to drink should be provided throughout the day, particularly in hot/dusty environments to avoid dehydration. Rehydration salts could be provided by the vet.
- If linked to exhaustion and low body condition score, adequate rest and improved feeding could help the animal to recoup lost energy reserves. A suitable (warm, comfortable) resting area should be provided for the purpose.
- It may be necessary to remove other animals from the rest area (perhaps by the use of partitions) to allow the affected animal to rest without being disturbed.
- With learned helplessness, there is some evidence that this leads to changes within the animal's brain chemistry⁶ which could be permanent. However, in less severe cases this may be reduced by an improvement in the animal's environmental conditions.

Longer term solutions

- Consistent handling and welfare-friendly training are vital. Humane training and 'starting' practices and welfare-friendly methods of restraint should always be promoted. Reward-based training methods will prevent animals becoming habituated to violent treatment.
- Working equids will require adequate quantities of good quality feed to provide them with the energy they need to work, which will also provide the essential nutrients needed to maintain general health and fight disease. Feeding should be adapted to the animal's individual needs.
- Equids should be fed a mainly forage diet (grass or hay) but working equines are likely to have additional energy requirements which would need to be provided in the form of "hard" feeds such as grains (e.g. oats, barley or maize) or commercially available concentrate feeds. Whatever is fed it should always be good quality and free from dust, mould and foreign objects.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.



Means of resolution - improved feeding.

⁶ Hall, et al (2008)

Animal Behaviour

Fear and aggression

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Observer approach

Chin contact

Tail tuck (donkeys only)

General attitude

Welfare issue

- The animal is afraid or displays an aggressive response during handling.



Horse showing avoidance (rushing backwards) due to fear.

Welfare significance

Risk of injury

- Fear responses can lead to unpredictable actions in equids such as shying, leaping away, bolting, etc. which can be dangerous for the animal as well as the handler and/or bystanders.
- It is therefore important for animal welfare and human safety that signs of fear are recognised by those handling equids, and handling adjusted accordingly.
- If the animal is displaying fear responses that are being ignored, and feels unable to escape due to being restrained, then the animal's only perceived option is to progress to an aggression response.



Donkey displaying aggressive behaviour during handling.

Negative handling and distress

- Fearful and aggressive behaviours will often provoke a negative human reaction as owners become angry or afraid.
- This can lead to an escalating cycle of heightened reactions from the animal leading to increasingly violent human responses in an attempt to control the unwanted behaviour.
- In addition to causing more stress and suffering at the time, the ultimate outcome of this could be that the animal learns that it cannot prevent the negative human interaction despite its best efforts and enters a chronic state of learned helplessness¹. (See *Apathy* summary for more information.)
- Fear or aggression responses indicate the animal is becoming stressed. Chronic stress leads to immuno-suppression, which can make it more difficult for the animal to fight disease, making illness more severe or longer lasting.

Pain

- The animal's natural response to minimise pain (e.g. lying down or standing very still) can mask fear responses.
- For example, pain in the hooves or limbs may reduce the chance that the animal will display avoidance behaviour, or that such behaviour may be less pronounced.
- Conversely, a protective response to pain can heighten an aggressive response in an attempt to prevent further pain occurring.



Horse displaying aggressive behaviour to the approaching human.

¹ Hall, et al (2008)

Possible causation

Current pain or discomfort

- Both fear and aggression behaviours can be indicative that the animal is in pain or has experienced pain in the past and is trying to reduce the likelihood that the pain will recur.
- The animal may be afraid that the painful body part will be touched and so could display fearful behaviour such as avoidance, guarding/hiding or aggressive threat displays to prevent contact with a painful area.
- A protective response to pain can heighten an aggressive response in an attempt to reduce or prevent pain. For example, an animal with harness sores may bite when the handler approaches to put the harness on.
- Some causes of pain may not be immediately apparent, such as abdominal or dental pain so handlers should be alert to signs of fear and/or aggression and consider all possible causes.

Previous pain and discomfort

- Equids, especially donkeys, have excellent memories. When a previous experience is linked to a painful or unpleasant outcome the memory is particularly strong.
- The animal may have learned in the past that the approach of a human is followed by a painful procedure (e.g. a veterinary procedure or beating), therefore makes attempts to avoid the approaching human, or begins to display aggressive threat behaviours. This may proceed to genuine aggressive actions directed towards the human if avoidance is not possible.
- This can sometimes be mistaken by owners for being 'naughty' or being unwilling to work, when actually the animal is afraid due to past negative experience.

Rough handling

- When equids are subjected to rough or uncomfortable handling (e.g. pulling, hitting, kicking, shouting, whipping) they can learn to associate any attempt at handling with unpleasant or painful consequences.
- For example, a donkey who has been pulled by the ears may display a fear response to movements near the head or ears (head-shyness). The donkey has learned to associate contact with the ears with pain, and so is afraid of this and tries to avoid it.

Frustration

- Working animals live by human timetables rather than their own natural equine time budgets, meaning that opportunities to eat, drink, rest and socialise and perform other natural behaviours are restricted to times convenient to their handler. This unnatural time budget means that equine animals do not spend the normal quantity of time doing activities that they would in the wild.
- Equine animals are highly motivated to perform some natural behaviours, e.g. grazing for long periods of time, staying with a herd. Being prevented from performing highly motivated behaviours can lead to frustration, which in some cases may progress to aggressive behaviours. For example, an animal who can see others feeding but is prevented from joining them, could display aggressive behaviour towards the person/people it perceives as preventing feeding.



Horse showing aggressive behaviour at time of feeding; frustrated motivation to access feed.

Unfamiliarity

- "Neophobia" is the fear of anything new or unfamiliar.
- Prey animals like equids are naturally afraid of anything unusual or unexpected in case it turns out to be dangerous. Therefore neophobia, and avoidance of anything new, is a normal equine behaviour.
- The extent of neophobia varies between individual animals, according to several factors such as temperament, previous experience, environment, age.
- Examples of neophobia include being nervous of strange equipment such as buckets or tools, close proximity of other unknown animals, entering a new place, and even unusual smells such as disinfectant.

² McGreevy 2004

Means of resolution

- Only actions which are both necessary and useful should be carried out on animals displaying fear/aggressive behaviour. If the animal is very fearful, consider whether it is appropriate to continue the activity or whether it would be better to postpone it.
- Work more slowly, avoiding sudden movements, and take time to comfort the animal (using a calm, voice, stroking the neck, etc.).
- The presence of another animal of the same species nearby can be helpful to reassure the animal, however the other animal must be calm and relaxed.
- Providing timely treatment for injuries or disease can reduce the likelihood of fear/aggression behaviours being displayed as a result of pain.
- Equids, as a prey animal, may find having their movements restricted frightening, and therefore welfare-friendly restraint (well-fitting head-collars) should always be used, and attention paid to the animal's feelings during all handling interactions.

Longer term solutions

- Positive reinforcement increases the likelihood that a behaviour will be repeated, however, it is vital that the reward is delivered immediately or the animal will be confused and its behaviour will become unpredictable².
- Counter conditioning can be effective in lessening fear responses, for example, exposes the animal to pleasant consequences of being approached by humans, such as offering food or positive handling interactions so the animal learns not to be afraid.
- Negative human interactions should be avoided, e.g. beating, or shouting. Calm and gentle handling must be promoted at all times.
- Speaking to the animal in a quiet voice, applying equipment or harnessing gently, improving driving techniques to avoid discomfort, and using comfortable methods of restraint will all help to reduce fear and aggression.

Refer to the *Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines* before conducting an intervention.

Poor Human Practices

Hobbling

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Hobbling

Welfare issue

- The term “hobbling” refers to the practice of tying any part of the animal’s limbs.
- Any combination of limbs may be tied including: fore limbs tied together, hind limbs tied together, one fore tied to one hind; hind limb tied to neck. Hobbling can also refer to the practice of tying the animal’s limb to either a fixed point (e.g. a tree) or a heavy weight (e.g. a tyre); or tying up of one limb so only three feet are on the ground.
- This practice can leave characteristic lesions on the skin which can be easily observed.

Welfare significance

Injury and infection

- Hobbles can be tied around any part of the limb and they can rub or cut into the skin leading to lesions, infection and swelling.
- When tying around the lower limbs, pressure on the tendons can cause damage and inflammation of the tendons, leading to lameness.
- The skin around the pasterns is particularly delicate, and being near to the ground, injuries in this easily be contaminated by soil, urine or faeces increasing the risk of infection.
- Dermatophilosis (mud fever or greasy heel) is commonly found on the caudal pasterns of equids wearing hobbles¹. The condition is made worse by moisture and abrasion and is characterised by inflamed skin with tufted hair and crusted scabs. If the infection worsens, the skin can develop deep cracks or fissures (cracked heels) and the animal will become lame.
- Hobbled equids are at increased risk of tripping and falling, as limbs can become entangled in the tethering ropes, especially if the animal tries to move quickly or suddenly.
- In addition to the above, the practice of tightly tying up a limb also risks cutting off the circulation to the limb, causing severe discomfort and pain. This practice will make the animal particularly susceptible to falls as it cannot use its limbs adequately to balance, especially if jostled by other animals or startled.



Top to bottom: different types of hobbling.

¹ Brooke (2013)



Top: Hobbling injuries.
Bottom: Examples of poor hobbling practice.

Inhibiting rest and recuperation

- Often the hobbled animal cannot lie down or stand up easily, preventing adequate or comfortable rest after work.
- Exhaustion causes suffering and increases the risk of injury or collapse during work.
- Hobbles may also prevent the animal from accessing resources such as feed, water and shade, which can lead to loss of condition, dehydration or heat stress.

Detrimental effect on social and defensive behaviours

- By restricting movement, hobbles inhibit the animal from normal social interaction with other animals, e.g. play, mutual grooming. As herd animals, equids benefit from social interaction with conspecifics, and preventing this can have a negative impact on psychological welfare.
- Restricting movement may also inhibit rolling behaviour, which is an important means of self-grooming and relaxation for equids.
- Equids are highly attuned to signals from others within the herd; preventing an equid from responding to, or retreating from, aggressive threat displays can cause stress. This can lead to bullying and fear within the herd, and increased risk injury from aggressive interactions such as bites or kicks. This likelihood is further increased when animals are kept in crowded conditions.
- Injuries may be caused by dogs or other predators, as hobbled equids can neither defend themselves sufficiently nor escape if attacked.
- Ill-intentioned humans may harm, harass or steal hobbled equids, who are unable to defend themselves or escape.
- As a prey species, equids have a natural instinct to run away from any frightening stimuli (flight response), for example perceived predators such as dogs or humans. Restricting this natural response can cause fear and stress. If the animal lives in an environment where perceived predators commonly roam near to hobbled equids, accidents and chronic stress may occur.

Inhibition of normal musculo-skeletal development

- When young equids are frequently hobbled, this restriction of natural movement can impact on the development of the growing musculo-skeletal system. If the animal's movement is consistently restricted the muscles can become atrophied (wasted). This will be worse if the hobbles are always used on the same side.
- In the early stages of muscle atrophy this will cause stiffness and discomfort, but if not addressed the muscles will begin to waste away and muscle mass will decrease.
- An animal regularly hobbled, particularly since a young age, who develops chronic muscular atrophy may display asymmetrical skeletal and muscle development (one side of the body appears smaller and more wasted compared to the other).
- This will cause the animal to be weaker, less productive at work, and to suffer more discomfort and injuries whilst working than one with correct and even musculo-skeletal development.

Possible causation

Reasons why hobbles are used include:

- To prevent the animal straying, especially near roads or private land.
- To make the animal easier to catch.
- When turn out/grazing areas are unfenced/inadequately fenced.
- To prevent the animals from fighting with each other.
- To prevent the animal from kicking.
- To increase the density of animals that can be housed in one area.
- Indoors, to prevent the animal soiling its feed or around the stable.

Hobble injuries can be caused by:

- Abrasive or inflexible materials. Nylon webbing (e.g. car seat belts or lorry webbing straps) and other harsh man-made materials (e.g. plastic rope) should not be used as they make a sharp edge against the skin. Soft, natural materials (e.g. leather, cotton, plant fibres) will minimise the risk of abrasion and lesions.
- Thin hobbles. Hobbles should never be made from thin rope or wire as these will cut into the skin as the animal moves. Thicker materials are preferable as they distribute pressure over a wider area of skin, reducing the likelihood of skin breakage.
- Consistent hobbling of the same part of same limb. Alternating which limbs are hobbled can reduce damage to the skin².
- Tight hobbles. Slip knots (become increasingly tighter when pressure is applied) should never be used to hobble an animal as the knot will tighten and damage the skin or even cut off blood circulation to the hoof.
- Hobble ropes becoming tangled and putting greater pressure on limbs.
- Owners pulling on hobble ropes to lead or drag the animal.



Safely tethered equine.

Means of resolution

- Tethering by the neck is recommended as an alternative method of preventing animals from straying. Tethering has the advantage over hobbling because it gives the animal greater freedom to express natural behaviour, feed, drink, rest and defend themselves, whilst still being suitably restrained.
- Equids should be tethered using either a head-collar or wide neck-strap (whichever is chosen must be well fitting to avoid injury or being pulled over the animal's head) and a strong rope. Nylon webbing should be avoided as it tangles up very easily, thus shortening the length of tether available to the animal.
- The end of the rope should be attached to a tether spike driven into the ground so it is flush with the ground surface to prevent injury. Care should be taken if tethering to trees or posts, as the animal can wind its rope around the tree to the point where it becomes immobilised or choked.
- Animals should be tethered close enough to see one another, but far enough apart to avoid tethers becoming tangled.
- Animals should be able to access water, shade and feed when tethered.
- Limb hobbling should only be used as a temporary means of restraint, not as a substitute for providing more comfortable resting opportunities for the animals.
- If limb hobbling is used, the limbs should be closely monitored so that early signs of injury can be identified and remedial action taken.

Further advice on tethering/hobbling can be found in the **Hobbling and Tethering Factsheet produced by the Brooke**³.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

² Zaman (2008)

³ Brooke (date unknown)

Poor Human Practices

Firing



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Firing: severity

Firing: size

Welfare issue

- The animal displays evidence of the practice of firing on its body.
- Firing (also known as thermocautery) is the practice of burning or branding the skin with red hot irons or wires.
- Firing marks can be seen as lines, dots or patterns. They are commonly found on the limbs, but can be located anywhere on the body including on the face/head, neck, shoulders and/or hind-quarters.
- Firing of the palate (roof of the mouth) is carried out in some countries to treat “lampas” (swelling of the hard palate)¹.

Examples of different forms of firing marks.



Animal displaying an apathetic posture and firing marks.

¹ Brooke (2013)

Welfare significance

Pain and fear

- Firing is an extremely painful and traumatic procedure and will cause a great deal of distress to the animal.
- Fear responses and escape attempts during and after the procedure can make the animal's behaviour unpredictable, which is potentially dangerous for handlers, bystanders and the animal itself.
- The process has been found to cause pain and stress for at least 24 hours after the procedure².
- When animals are subjected to repeated firing, the trauma can lead to a state of depression, lethargy and even learned helplessness. (See the [Fear and Aggression](#) and [Apathy](#) summaries for further information on behavioural responses.)
- When firing was carried out historically by veterinary surgeons, the area to be fired would be anaesthetised. The animal would then be supported with analgesics (painkillers) until the wounds had healed, and completely rested (often for over a year for tendon firing).
- Even under these conditions the practice is now widely recognised as being an ineffective treatment causing unnecessary suffering^{3,4}, and detrimental to the health of the animal⁵. In many countries, the practice is considered as unethical and cruel⁶.
- When local healers or owners conduct firing without the use of anaesthetics and analgesics, the pain and suffering endured by the animal will be extreme, particularly as working equids are unlikely to be rested for a significant period of time after the procedure.

Poor healing/skin damage

- Firing causes a thinning of the skin and produces an acute inflammatory response in the sub-dermis (the deepest layer of the skin)⁷.
- Where the skin over a joint has been fired (commonly the knee, fetlock or hock joint) the repeated flexion of the joint as the animal moves will pull the wounds open. This prevents the wound from generating new epithelial (skin) cells which will ultimately prevent the skin from healing correctly. The result will be extensive scarring and potentially the formation of “proud flesh” i.e. granulated tissue. Proud flesh can prevent the formation of epithelial cells and are rich in blood vessels which can lead to excessive bleeding if damaged. If severe, proud flesh can protrude beyond the area of the wound and can inhibit joint action⁸.
- A study into the effects of firing on limb tendons found that skin subjected to firing became thinner and weaker⁹, making it more susceptible to future damage.
- It was also found that scar tissue formed “cores” of permanent weakness within the tendon¹⁰ making future injuries much more likely. Some horses also developed areas of necrotic (dead) tissue on the firing site¹¹.



Close up of an injury where proud flesh has been generated.



Firing marks on a joint displaying poor healing.

^{2,6} Hayward and Adams (2001)

³ Hayes (2007)

⁴ Schultz (2004)

⁵ BEVA (2010)

⁷ McCullagh, Goodship and Silver quoted in Hayward and Adams (2001)

⁸ Cable (2000)

^{9,10} Silver and Rosedale (1983) quoted in Hayward and Adams (2001)

¹¹ Larsen LH (1960) quoted in Hayward and Adams (2001)

Infection

- Any wound to the skin leaves the animal vulnerable to local or systemic infection.
- A compromised immune system caused by extended periods of stress and/or poor nutrition will reduce the animal's ability to fight infection.
- Large or deep areas of firing, and those over joints, will heal slowly which increases the potential for infection to set in.
- If an infection is able to penetrate into the tendon fibres or the bone (due to deep pin firing) then the prognosis for recovery is likely to be poor.

Difficulty eating and drinking

- When firing inside the mouth has occurred, the pain and swelling of the palate, tongue and lips can inhibit the animal from eating and drinking. This can potentially lead to dehydration, colic and loss of body condition, in addition to extreme pain.
- Severe pain coupled with delayed healing is likely to occur if animals are worked with a bit in the mouth before oral wounds have completely healed. In some cases, even after wound healing, there may be continued discomfort.

Possible causation

- Attempt to prevent or treat injuries. There may be a belief that the "counter irritation" of the skin or other tissues is an effective remedy for lameness and disease (which evidence has shown is not correct).
- Decoration of the animal. In some cultures, firing is used to create patterns on the skin or the equids or other animals (sometimes humans).
- Identification purposes. Equids may be branded in order to signify ownership or differentiate from others.
- Lack of access to veterinary facilities and treatments. Where veterinary services are scarce, under-resourced or unaffordable, owners are more likely to use local healers or traditional remedial practices.
- Traditional beliefs and practices. There may be peer pressure from other owners or those who conduct firing to continue the traditional firing practices despite no scientific evidence for its efficacy.
- Lack of basic health care knowledge. Owners may not understand the basic physiology of the animal and therefore why firing is an inappropriate response to, or prevention for, injury or disease.

Means of resolution

- Challenge the traditional belief in firing through the use of evidence-based discussion with owners and local healers.
- Promote injury and disease prevention through good nutrition, well-fitting harness, adequate rest and safe handling techniques. This will reduce the need for firing as both a preventative and remedial measure.
- Alternative, non-invasive, means of decoration such as braids, ribbons or non-toxic pigments, should be promoted.
- Alternative, non-invasive, means of identification, such as hair dyes or coloured ties around the animals' necks should be promoted.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.



Animals with other means of identification such as dyes (top) and coloured ties (bottom).

Poor Human Practices Mutilations

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

- Ear mutilation
- Muzzle mutilation
- Tail mutilation

Welfare issue

- The animal presents evidence of mutilation to the tail, ears, nostrils/lips.
- This can include cutting, slicing or piercing the ears; cutting the nostrils, lips, or piercing the septum (the cartilage dividing the two nostrils); amputation of the tail; or any combination of these.

Examples of various mutilations.



Welfare significance

Pain and infection risk

- Amputation or cutting of body parts will lead to pain and risk of local or systemic infection. Both the nostril and the ears in particular are sensitive structures so these procedures will be very painful.
- There is risk of tumours (neuroma) and even phantom pain in the amputated body part. Although this is not well studied in equids, phantom pain is a well-recognised side consequence of amputation in humans and so is likely to also occur in other mammals as the tissue structure is similar (REF TO BE ADDED).
- With any mutilation to the nostril area, large quantities of bacteria present in the nasal passage can lead to the wound becoming infected easily.

Stress

- The animal is likely to become stressed by being restrained for the procedure to take place and the painful procedure itself.
- Equids have extremely good memories for events that they find frightening and/or painful, which means there can be longer-lasting psychological effects even after the wounds have healed. This is even more likely where multiple procedures are performed. For example, animals subjected to ear and/or muzzle mutilations may become head-shy after the mutilation if they have learned to associate restraint of the head with a traumatic procedure. Note: "the inability to [verbally] communicate in no way negates the possibility that an individual is experiencing pain or is in need of appropriate pain relieving treatment"¹.



¹ West et al (2009)

Discomfort

- Equids need their tails for a variety of reasons including protection from insects and for protection against inclement weather (observe how horses turn their hindquarters towards the wind or rain during poor weather, the long hair provides warmth and guides water away from the skin).
- Equids also use their tails to indicate mood towards other horses and people e.g. an angry horse may thrash its tail, whereas a frightened donkey will clamp its tail down to its quarters. Shortening or removing the tail means that the animal will be tormented by flies and will find it difficult to signal its feelings which could lead to attacks or bullying from other horses.



Tail swishing away flies.

Possible causation

- Cultural beliefs. There may be a mistaken belief that these procedures are beneficial to the animal and will improve health and performance. In some cultural traditions amputating a body part means that the power or energy invested in that body part is made available for the rest of the body.
- Convenience or safety. This applies predominantly to tail mutilations which may occur in some work types to minimise tangling with harnessing.
- Lack of welfare knowledge. There may be little or no understanding of the true causes of health problems and how they can be rectified.
- Lack of access to veterinary facilities and treatments. Where veterinary services are scarce, under-resourced or unaffordable, owners are more likely to use local healers or traditional remedial practices.

Ear mutilations

- Ear mutilations are often carried out for identification reasons, as any mutilation will be permanent. In some locations, cutting the ears is traditionally believed to prevent tetanus² (which is of course ineffective).

Nose/muzzle mutilation

- If an equid is performing poorly the owner may believe that improving the animal's airflow will increase oxygen intake and so improve energy, which may be attempted by slicing the nostrils to enlarge the airway. This is a very painful procedure and will cause a great deal of bleeding and distress for the animal³.



Pierced septum/ring/rope through nose.

- Increasing the size of the nostrils by slitting them in this way will not increase the volume of air the animal is able to inhale as this is determined by the animal's lung capacity rather than nostril size.
- In other instances the nostrils may be slit and the septum pierced in order to enable a rope or other material to be passed through a ring through the nose in the manner commonly used with cattle/buffalo. Equine animals are better controlled and restrained by the use of a well-fitting head-collar or bridle, which uses pressure on the outside of the nasal bone, poll and the mouth rather than on the septum. Leading them via the septum is a painful and unsafe method of restraint.

Tail mutilation

- Historically, equine animals' tails were docked to prevent them becoming tangled in the harness, plough or reins during draught work. However, there is no evidence that docking the tail improves the safety or welfare of draught horses⁴.

Means of resolution

- Although there are various reasons for mutilations, all should be challenged as ineffective and contrary to good standards of equine welfare.
- Owners should be educated that performance is improved by correct feeding, good handling, avoiding over-loading and adequate rest, not by nostril slitting and shown the scientific evidence for this.
- It should be explained that respiratory problems can be alleviated by providing clean, dust-free feed, bedding and rest areas. This is particularly important where working conditions are dusty to allow the animal a break from air-borne pathogens.
- Scientifically proven preventative measures for disease should be promoted where these exist and are available, e.g. tetanus anti-toxin.
- Non-invasive, welfare-friendly means of identification, such as hair dyes or coloured ties around the animals' necks should be promoted as an alternative to ear mutilations.
- Tying up, braiding or bandaging of the tail can be used to keep it clear of the harness rather than cutting.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

² Brooke (2013)

³ Harris (2010)

⁴ Cregier, S and Lefebvre et al quoted in the Canadian Veterinary Association (2013)

Poor Human Practices

Castration



SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Sex

Genital/rectal lesions

Welfare issue

- Castration (also known as 'gelding') is the procedure of removing a stallion's testicles for the purpose of making it infertile, and to reduce stallion-like male behaviour.
- This makes the animal more docile and easier to handle, particularly in the presence of other equids.
- Mules are born infertile, so castration may still be carried out to reduce unwanted male behaviours.



Animal is normally kept isolated therefore displays excitement, and becomes difficult to handle when in the company of other equids.

Welfare significance

Severe pain and suffering

- In locations where castration is carried out by untrained people using crude (cruel) methods, the animal is not anaesthetised for the procedure, or provided with pain relief.
- Castration carried out without anaesthetic is excruciatingly painful and owners should be made aware that "the animal's inability to [verbally] communicate in no way removes the possibility that an individual is experiencing pain or is in need of appropriate pain relieving treatment"¹.
- Crushing, tearing or twisting of the testicles is poor welfare practice and is likely to have both short and long term negative welfare effects on the animal, causing both physical and psychological trauma.

Fear, distress, psychological trauma

- General anaesthetic renders the animal unconscious and therefore acts as a means of chemical restraint. Without anaesthetic, physical restraint will be used, generating fear and aggression responses from the stallion and making the procedure dangerous for the animal and the handlers.
- In some cases the stallion may be 'cast', i.e. its legs tied together and then pulled out, causing the animal to fall to the ground. Equids are prey animals and being pulled to the ground by a 'pack' of humans simulates being attacked by predators, so the stallion is likely to suffer great fear and distress, and resist violently to attempt to free itself, risking physical injury too. If several people pile onto the animal to pin it down this will cause even more psychological trauma.
- The stress, trauma and pain experienced means that an animal castrated in this manner will take longer to recover and is more likely to succumb to infection than one castrated using a more welfare-friendly method. High stress leads to immuno-suppression, making it more difficult for the animal to fight disease and infection, thus making illness longer or more severe.

- Equids have excellent memories, particularly of painful or unpleasant experiences. Therefore an equid exposed to such a traumatic procedure may develop a deep-rooted fear of humans, making handling more challenging, or even impossible, in some cases for most of their life.
- Conversely, the animal may be so traumatised by the procedure that changes occur within the brain chemistry² (which could be permanent) causing a state of 'learned helplessness', characterised by an apathetic demeanour. See the [Apathy](#) section for more information on this welfare issue.

Ineffective or dangerous procedures

- Appropriate surgical castrations are carried out using either the standing method (with local anaesthetic and sedation) or under general anaesthetic. Donkeys should never be castrated standing as they have a tendency to bleed more, which requires the spermatic vessels to be tied off³. Older stallions (i.e. more than 3 years old) should be castrated under general anaesthetic for the same reason. This risk of excessive, possibly fatal, bleeding and other complications is far higher in the Brooke context when castration is by untrained people using crude procedures.
- Only equine emasculators are suitable for use on equids. Cattle castrators should never be used as they will not stem the blood flow sufficiently and the animal could haemorrhage and die⁴.
- Crushing, tearing or twisting of the testicles may not be entirely successful in removing or destroying the testis, meaning that the animal may still be fertile despite a 'castration' procedure. Therefore the animal's welfare has been severely compromised, and the desired outcome may not even be achieved.
- This also has welfare implications for female equids who are impregnated unplanned by an improperly castrated stallion.

¹ West et al (2009)

² Hall, et al (2008)

^{3,4} Brooke (2013)

Infection

- When castration is carried out by untrained persons, in unsanitary conditions, or with inadequate post-operative care, there is a high risk of infection within the scrotum or urinary tract, by tetanus or staphylococcus bacteria which can prove fatal.
- In some cases a scirrhus cord infection can develop. This is when an abscess develops on the spermatic cord, characterised by openings in the scrotum discharging pus, accompanied by a hard lump in the groin area. There may also be signs of lameness and colic (colic is a veterinary emergency which can quickly become fatal). Such abscesses may take years to develop and are extremely difficult to treat. If the infection spreads into the abdomen then the prognosis is hopeless⁵.

Complications

Other serious complications from castration include:

- Haemorrhage - a serious haemorrhage requires the location and ligation (tying off) of the blood vessel, which requires competent veterinary intervention.
- Prolapse of the bowel (eventration) - a rare occurrence where a section of bowel protrudes through inguinal canal and out through the castration wound. In the Brooke context this condition is untreatable and euthanasia is necessary⁶.
- Scrotal swelling - some swelling is expected even after a welfare-friendly veterinary castration, but should subside within 4-12 days. Excessive swelling, or swelling which persists beyond this time suggests an infection has developed.
- 'Champignon' - a characteristic mushroom-shaped growth of proud flesh developing from the castration wound. Proud flesh is prone to excessive bleeding if damaged.

Castration of foals

- Castration can be carried out at any age but generally it is done in younger animals (1 to 3 years) to reduce complications and prevent the development of stallion-like behaviours.
- Castration of foals less than 1 year old is controversial. Advocates state that a foal is easier to restrain and that there are fewer accidents and complications castrating foals; however, disadvantages include increased distress and psychological trauma due to the foal being less used to being handled, the testes being smaller and more difficult to handle and possible negative consequences on the animal's development⁷.
- When older stallions are castrated, stallion-like behaviour may already have become learned rather than being governed by hormones, meaning that castration will not have as noticeable an effect on reducing the stallion-like behaviour.

Some welfare benefits of castration

- Whilst many forms of castration carried out within Brooke countries are cruel and carry a high degree of risk, castration carried out by trained veterinarians with access to suitable facilities does carry a number of welfare benefits for stallions.
- Stallions exhibiting natural behaviour such as guarding or mounting mares can cause accidents and provoke negative interactions from handlers and owners of both the stallion and the mares. In Afghanistan, owners reported beating stallions that were approaching their mares with hammers and shovels causing substantial injuries⁸.

- In other instances, owners attempt to prevent natural masturbation behaviours by attaching rings or tying string to the penis, or devices with bristles or nails to the underside of the abdomen. Anti-masturbation devices not only fail to reduce masturbation, but in many cases actually increase the frequency and duration of episodes⁹. These devices can also cause abrasions, lesions and scarring to the penis and become a source of pain and infection.
- In some cases, stallions are isolated from other equids to avoid accidental impregnation of females, or fighting with males. As a herd animal, isolation is extremely stressful for equids and many stallions housed in isolation exhibit stress-related stereotypic behaviours such as box walking, crib biting, aggression and self-mutilation.
- For male equids not intended for breeding, welfare-friendly castration can enable an opportunity to mix with other equids safely, therefore having potential to improve welfare in contexts where the alternative would be isolation and punishment for displaying natural stallion behaviour.

Possible causation

- Castration can be perceived as a solution to 'aggressive' behaviour from stallions, or to make male equids more docile and easier to handle. This can help to protect owners/handlers and other animals from injury caused by stallion-like behaviour.
- It may be performed to reduce stallions making attempts to escape to seek mares.
- In contexts where it is considered inappropriate for some members of the household to observe natural reproductive behaviours from stallions, castration may occur for cultural reasons, so that male equids can be housed near the owner's home.



String tied around penis.

Means of resolution

- Owners should be encouraged to understand why the animal is displaying 'aggressive' behaviour. Is this natural stallion behaviour or a result of frustration, fear or pain caused by negative human interactions? The [Fear and aggression](#) section has more information on identifying causes of aggressive behaviour.
- Improvements to handling techniques and encouraging positive interactions (e.g. grooming, feeding, etc.) to create a bond between the animal and owner can reduce the risk of injury and make stallions easier to handle. Aggressive behaviour in stallions is often increased due to owners behaving aggressively towards the animal, thus forming a vicious circle.
- Improved, welfare-friendly training methods will make stallions easier to handle and can be promoted as a welfare-friendly alternative to castration (improved training will also have many other benefits for both equines and owners).
- Improvements to fencing or tethering can prevent roaming and escape.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

Disclaimer

Should evidence suggest castration is a priority welfare issue, please contact the Brooke UK's Service Provision Team for further discussion on next steps. This is the due to the high degree of welfare risk involved with this management practice.

^{5,7} Hayes (1992)

⁶ Brooke (2013)

⁸ K. Wells, personal communication

⁹ McDonnell (2000) quoted in McGreevy (2004)

Poor Human Practices Underage Working

SEBWAT parameter

(Standardised Equine-Based Welfare Assessment Tool)

Age

Work type

Welfare issue

- The equid is too young and underdeveloped for the work being performed.
- The SEBWAT guidance notes provide details on how to estimate the age of equine animals.
- The age at which an equid is physically mature varies between species. Generally smaller horses and ponies reach physical maturity by age 3-4 years old, and larger draft breeds can take longer than this.
- Donkeys and mules are slower to develop than horses and therefore mature later.
- In SEBWAT, the first age category includes equids up to 3.5 years. All animals in this age group are considered too young for weight-bearing work, and some animals in the next age group (3.5 - 7 years) may also be too underdeveloped for the type of work being conducted, due to individual breed/species differences as described above.



Young mule.

Welfare significance

Severe pain and suffering

- Underage working, and particularly weight-bearing work, is likely to cause discomfort and lameness both in the short- and long term, in addition to psychological issues, and thus is a serious welfare concern.

Phytitis

- Like all mammals, immature equids have spaces between the ends of their bones filled with cartilage (known as the metaphyseal growth plates). As the animal grows and matures, the bones lengthen and the cartilage matures into bone (ossification), which causes these spaces to 'close up' (in adult mammals this space has completely closed as bones fuse together).
- *Phytitis* refers to the inflammation of these growth plates, and is characterised by localised heat, pain and swelling. There may also be lameness or stiffness.
- Phytitis is sometimes referred to as 'growing pains', but when the inflammation is due to stress or trauma from overwork, the growth plate can suffer a crushing injury due to excessive weight bearing. This leads to chronic and incurable lameness.



Donkey adults and foal at a brick kiln.

Developmental Abnormality

- When immature bones are placed under stress this can affect their growth. If the growth plate has been damaged, uneven growth can occur; this means that one side of the bone grows faster than the other, resulting in an angular deformity¹.
- This deformity affects foot placement, which in turn affects the wear pattern of the hoof, i.e. a limb bent outwards will put additional stress on the inner wall of the hoof, and vice versa.
- If this abnormality is not identified and corrected before the bone finishes growing it will become permanent and can lead to chronic, incurable lameness.
- In other instances the limb can take on an 'hourglass' shape, when the growth plates at the ends of the long bones become enlarged or flared².
- Chronic lameness associated with joint pain can lead to asymmetry in the animal's skeleton or musculature (i.e. differences in one side of the body compared to the other); for example, uneven muscle development on one side of the body, or one hip joint higher than the other when viewed caudally (from behind).
- These musculo-skeletal abnormalities become increasingly difficult to correct as the animal gets older, so exposing young equids to these stresses is highly likely to lead to a lifetime of lameness, pain and compromised welfare.



Leg deformity, traditional treatment was applied to the skin in attempt to heal lameness.

Cartilage and Joint Damage

- As well as damage to the ends of the bones, underage working can also damage the cartilage in between the two growth plates.
- The cartilage can harden due to the inflammation (*sclerosis*).
- There could also be varied irregularities within the growth plate, such as *lysis* (rupture) or even premature closure (bone bridging across the cartilage plate)³.
- If not detected and addressed early, extensive areas of damaged cartilage can develop, which will trigger arthritis (degeneration of the smooth surface areas within joint capsules) and the prognosis for soundness in adult life is poor⁴.
- *Osteochondrosis* is a condition affecting horses (it has not been reported in donkeys⁵) in which the cartilage within the growth plates is damaged. The cartilage fails to ossify (turn to bone), resulting in cartilage defects, such as a separation of the cartilage from the underlying bone, cracking and weak spots.
- Fragments of cartilage can even break off within the joint (*osteochondritis dissecans*) as a result of excessive force on weak bones or cartilage. *Osteochondritis dissecans* can occur in most joints, but occurs most frequently in the hock, stifle and fetlock joints⁶.
- Where *osteochondrosis* develops in the spine it can lead to instability, leading to a neurological condition known as 'wobbler syndrome'⁷.

Psychological Effects

- In addition to the negative physical effects of working equids too young, it can also have harmful psychological effects on the young animal.
- If young animals are subjected to discomfort due to any of the factors above, this can establish a negative association for the animal between work and pain, which can be very difficult to erase.
- This also increases the risk of negative interactions (such as shouting or whipping) from the handler in the mistaken belief that the animal is being 'naughty' or 'lazy', when in reality they are in pain or unable to move properly.

^{1,2,3} Cable (2005)

^{4,5,7} Brooke (2013)

⁶ American College of Veterinary Surgeons (2016)

- Equids have excellent memories for unpleasant situations, so introducing a young equid to such situations risks creating handling and behaviour problems at an early stage in life, which can increase the animal's welfare risks later. (See the [Fear and Aggression](#) summary for further information on welfare risks associated with these behaviours.)
- In addition, working very young equids means they have less opportunity and energy for socialising and play, which are very important developmental activities. Equids not given the opportunity to socialise normally don't learn to communicate with other equids and therefore are more likely to display fear or aggression behaviours towards conspecifics. These can lead to bullying, fights, injuries and negative intervention from owners.

Exhaustion

- Young animals do not have the strength, stamina or concentration levels of mature animals and so will tire more quickly.
- Exhaustion increases the risk of stumbling, falls and interference injuries, particularly if the animal already has a conformational tendency towards these forms of interference. (See the [Interference](#) section for more information.)
- It may also mean that the animals are too tired to eat or drink sufficiently after work, leading to weight loss, dehydration, or even colic.
- Owners may mistake tiredness for unwillingness to work, particularly if comparing the output of the young equid to a mature animal.

Possible causation

- Owners may feel under pressure to put their young animals to work as early as possible so that they can start earning money (and particularly to earn enough money to cover the costs associated with keeping the animal).
- Owners may not understand about equine skeletal development, or that an equid does not progress directly from foal to mature equid.

Means of resolution

- Education of owners about the importance of not working equine animals too early should emphasise that short-term gains from working a young animal are hugely outweighed by the shortening of the animal's useful working life, increased days off work due to lameness and reduced productivity. In addition to the (potentially chronic) pain and suffering of the animal. Owners should be encouraged to appreciate that there is a juvenile stage, when the animal may look like an adult, but does not yet have an adult's physical strength or stamina.
- Owners should be educated about welfare friendly 'starting' and training methods for young animals, and the importance of building strength and stamina slowly over time (conditioning)⁸.
- Minor angular deformities can be slowly corrected by corrective farriery to balance the hoof and allow the bone to straighten; this requires a highly skilled farrier and cooperation of the owner. More severe deformities are likely to require surgical intervention, (such as the use of screw plates), which is not realistic in the working equine context.
- Osteochondritis dissecans treatment depends on the location and severity of the problem, but often involves surgery to remove fragments. If the osteochondritis lesion is not removed, the prognosis for future soundness (proper gait) will be reduced⁹.
- Providing regular rest breaks and opportunities to play and socialise with conspecifics will greatly benefit young equids being introduced to work.

Refer to the Working Equid Veterinary Manual, Community Engagement work plans or strategies and the Handling Guidelines before conducting an intervention.

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