

# 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.



Normal coloured mucous membranes.

#### Welfare significance

- Mucous membrane colour reflects the oxygenation and perfusion (flow of blood through the body’s blood vessels) of the tissues<sup>1</sup>.
- 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.

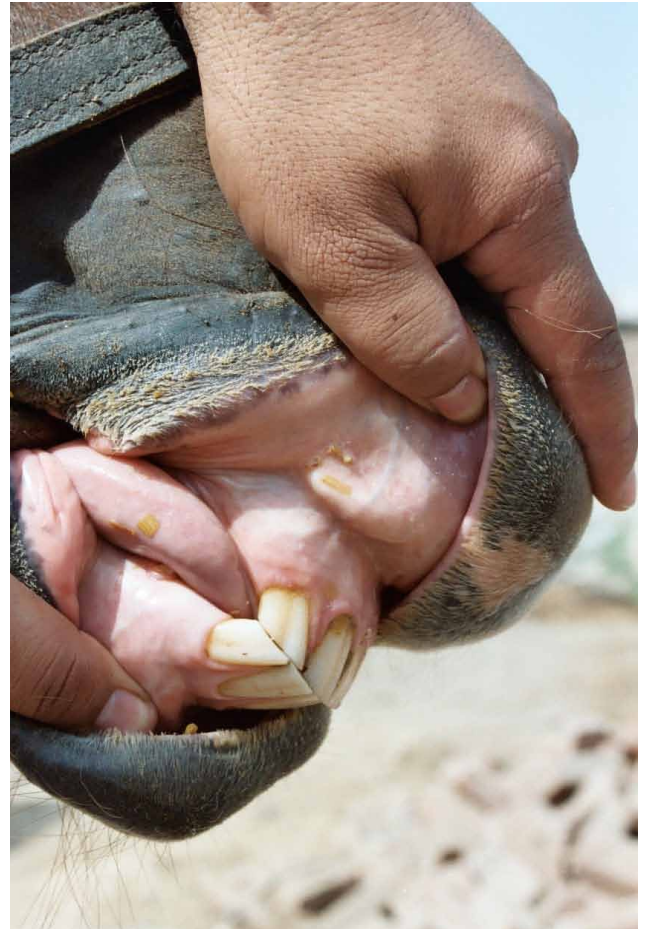
<sup>1</sup> Brooke (2013)

## 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)<sup>2</sup>.
- Pain/shock<sup>3</sup> - 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 organs<sup>4</sup>; 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)<sup>5</sup>.
- 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 alfalfa<sup>6</sup>.
- 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.

<sup>2</sup> WSAVA (2014)

<sup>3</sup> Field Service Penn Veterinary Medicine (date unknown)

<sup>4,6</sup> Loving (2013)

<sup>5</sup> 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 response<sup>7</sup>.
- 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 shock<sup>8</sup>.
- 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 risk<sup>9</sup>. 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..*

<sup>7,8</sup> Blikslager quoted in Loving (2011) <sup>9</sup> Field Service (accessed 2015)

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## References

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