Part B: Forage and Feed

Forage plays a critical role for both the nutritional status and respiratory health of your horse.

Nutritional Considerations

Forage is a critical, though often unappreciated, component of feeding horses. It is the staple of the equine diet. The type, quality and amount of forage determines what additional concentrates or supplements should be fed.

Forage provides fibre and bulk to the horse's diet. These aid digestion and normal gut function by diluting more readily fermentable material and stimulating peristaltic contraction. Good quality forage provides the fibre the gastrointestinal tract needs to function normally. The concentrate portion of the diet cannot be determined properly until a detailed nutritional analysis of the forage has been completed.

A tip for winter: remember, eating hay will generate heat for your horse. If possible increase the amount of forage your horse is receiving. Generally grass hay has a higher fibre content than alfalfa and, therefore, will generate more heat and provide more "chew time".

Boredom

Long hours in the stall can contribute to boredom-driven destruction or stereotypic behaviours. If possible, try increasing the amount of forage given or break it up into more feedings throughout the day.

Dust and Mould

Hay is the single most common source of dust and mould spores for the horse. Climatic conditions can make it difficult to properly cure field-dried hay. There are many types of fungi living in the field where our crops are grown and all hay will have some mould present. The spores from these types of mould ("field fungi") are usually large and have as high a chance of reaching the lower airways. The mould spores that are cause for concern are associated with hay that has been baled damp, as can happen after a summer with a large amount of rain. The high moisture content in the hay increases the metabolic activity of the organisms causing the temperature to rise. The moulds that thrive in this high moisture and heat are very prolific. The spores from these moulds are very small and when inhaled can travel deeply into the lungs. Also, in heavily moulded hay the nutritional value can decrease. Research has shown that mouldy hay cannot always be visually judged.

Moulding of Hay

The environmental factors that most closely control fungal activity during hay storage are moisture and temperature. As mentioned previously, adequate availability of moisture for fungal growth may be a result of baling at a high moisture content or moisture migration during storage.

There is an initial increase in temperature in the bales of hay when they are first stored. This is due to microbial activity. This temperature increase also results in a decrease in moisture content. If the initial moisture contents are too low to support microbial growth a subsequent temperature rise is not observed.

Management Methods

The soaking of hay is a time-proven method of minimising the horse's exposure to mould spores and dust. If you soak, it is essential that the hay is thoroughly wet. Dry areas of hay in a poorly soaked bale can release enough spores to cause problems. The duration of soaking is not as important as thoroughly wetting the hay to reduce the respiratory challenge caused by the airborne particles and mould spores. Ideally, hay should not be soaked for more than a ½ hour or else water-soluble nutrients leach out. Fresh water should be used each time. It has been shown that prolonged soaking of hay leads to losses of water-soluble carbohydrates, crude protein, vitamins and minerals. Hay that is fed indoors should be soaked and fed close to or on ground level. Your horse was designed to graze at ground level. Feeding on forage with an elevated head for extended periods of time can impair respiratory function. One last point: if you soak your hay, don't forget to do so when you trailer your horse as well.

Alternative Forage Products

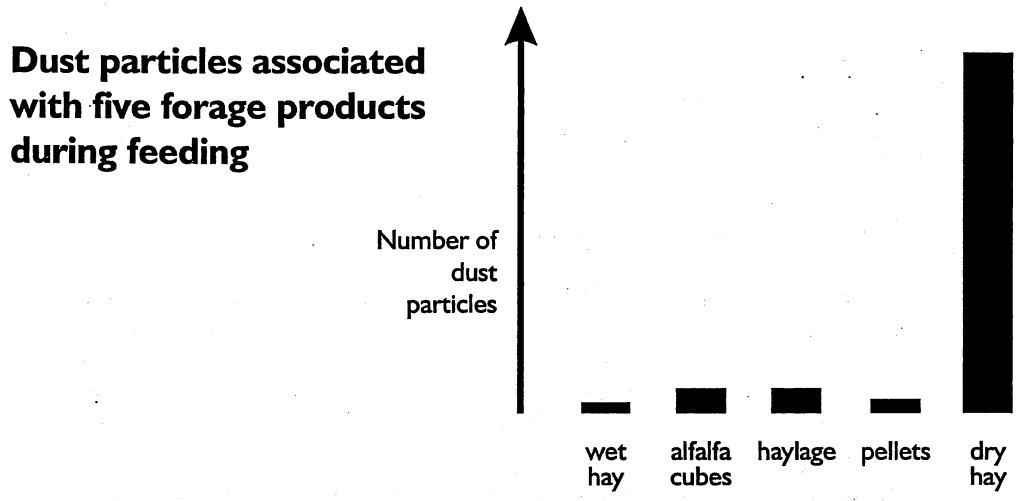
Soaking hay is a very effective method to reduce dust exposure but can be labour intensive or impractical in colder climates. Alternatives to hay such as hay cubes or haylage can be fed.

There are two basic forms of hay cubes. One is produced from previously baled hay, therefore, the quality of the cubes is dependent on the quality of the bales used. The other method is to take the plants directly from the field and cube them. This approach minimises nutrient loss and moulding.

Haylage is grass or legume that is baled with a high moisture content but sealed in airtight plastic bags. Haylage and silages are being used with increasing success as alternatives to hay. They rely on a fermentation process to increase acidity and inhibit the growth of mould and bacteria. When the bags are opened to feed, they should be fed within a few days as this product moulds very quickly once it has been exposed to air. Broken or damaged bags should not be used, nor should bags that smell of ammonia or contain dirt. There have been some instances of botulism associated primarily with round-bale silage. Studies at the Equine Research Centre

have shown that the dust challenges faced by horses are lower when fed alfalfa cubes, haylage, a complete pelleted feed or soaked hay, as compared to dry hay.

Figure 3



Preservatives and Additives

Preservatives and additives that decrease or inhibit mould growth during storage can be used to decrease field-drying time therefore allowing hay to be baled at a higher moisture range. The benefits include increased nutritional value due to a decrease in leaf loss during baling.

The rate of water loss during field drying declines exponentially. Progressively more time is required to achieve each additional percentage drop in moisture content. Unfortunately, longer field drying times are associated with decrease in forage quality due to plant cell respiration, nutrient leaching and leaf loss. The successful use of a preservative or additive will allow for a shorter drying time in the field.

However, if the forage is not treated uniformly or if incorrectly applied, moulding can still occur. Preservatives and additives can also affect palatability. But research has indicated that if not given a choice of hay feed intake is not affected.

Mycotoxins

Another danger that mouldy hay poses is the presence of mycotoxins. Mycotoxins are substances naturally produced by some types of mould. They may contribute to reproductive, immunological, respiratory, gastrointestinal and other disorders in the horse. Mould and subsequent mycotoxin contamination of forage can increase in extreme environmental conditions such as droughts or heavy rain followed by cold weather, or from mechanical damage to the forage.

Tips when feeding forage

- Design horse's diet to include as much forage as possible, then determine what additional concentrates / supplements are required.

- Investigate the quality of the hay before it is purchased.
- Wet all hay that is fed indoors and feed close to ground level.
- Or feed a good quality, low dust alternative forage product.

Keywords

Botulism: an extremely severe type of feed poisoning due to a toxin produced by the bacteria *Clostridium botulinum*, associated with improperly preserved or stored feed / forage.

Forage: Leaves, stems and stalks of plants

Haylage: Haylage produced for horses, is forage that is baled (small bales) after cutting at a high moisture content and stored under anaerobic (no air) conditions.

Peristalsis: the movement of contents through the digestive system caused by the wave-like contractions of the muscles lining the system.

Silage: Forage that instead of being dried after cutting, is stored in a silo or baled (usually in large bales) under anaerobic (no air) conditions.