

Horse feeding with silage?

From Dr. Norbert Uppenkamp from the Chamber of Agriculture in Muenster

Since the introduction of round bale silage wrapping there has been a rising tendency to feed horses with silage. There are several reasons for this trend; there is less dependence on weather conditions in comparison to the risk by hay harvesting, plus less risk of horse coughing due to dust allergy. Silage feeding has been renounced till now in stables with less than 20 horses, with a daily ration of 10 – 15 kilos of silage per horse, due to the increased loss of fodder and increased risk of additional fermentation by such a small amount of daily extraction from the mobile silo, in such stables the only suitable method for self-produced silage is the round bale wrapping system, where every bale is a small self-contained silo.

Last year there have been very good, occasionally very bad, experiences with wrapped round bale silage. The reasons for unusable round bale silage can often be found in unprofessional silage production but also in poor quality harvest. It has been observed that horse owners who have, till now, only won hay for feeding, the harvest was cut far too late. Harvest for silaging must be cut much earlier in order to obtain less stalky material, resulting in better consolidation when compressed. Only then it can be guaranteed that little air remains in, or slowly enters, the bales. An additional advantage of early harvesting is that more energy is conserved in the material so that bacteria find sufficient food for the production of lactic acid, a prerequisite for the durability of silage. By comparison, the raw protein content of early harvests, especially where fields and meadows have been intensely fertilised, is substantially higher, so that the risk of an overdose of protein in silage fodder, especially notable for its effect on the horses' hind legs, is present by premature harvesting. So the ideal time for harvesting horse silage fodder lies later than that for cattle, namely between the growth of the ears/panicles and blooming of the harvest. Experience shows that, in comparison to hay, these delicate stems are very digestible as silage. Loss of profit, due to earlier harvesting, need not

be feared. The volume of dry weight harvested at the first cut is less than that of hay harvesting, but the subsequent rate of grass growth is substantially accelerated.

The pre-requisite for good silage is fast withering of the grass to about 40 – 50% of dry material. When the withering is too extreme, there is an increased risk of weather influence and the danger of older, stemmy, brittle spikes perforating the wrapping film is higher. The poor consolidation of such material increases the risk of extra fermentation and the development of mildew, as air quickly enters the bales. When, however, material with a dry material content of over 65-70%, better suited for hay, is wrapped in stretch film, it can be well assumed that there is insufficient lactic acid fermentation and that fodder preservation follows as a result of the airtight film. Here great importance must be placed on the quality and quantity of the wrapping film.

Especially old grass needs more than 4 wrapping layers, for sufficient airtightness 5 – 6 layers are necessary. The extra cost per bale (with a diameter of 1,20 m) is between € 0,65 and 0,75 each.

Additionally it must be reckoned that loss of material due to crumbling, especially with very dry grass, increases when it is turned over mechanically.

In comparison to other silage production methods, the material taken in by presses isn't mingled, or hardly mingled. That means that care must be taken to see that the fodder is clean. The bundles of grass pulled out, by hay turning machines, with earth and manure attachments, are not separated but enter the press and then re-appear inside the bales. They are a source of faulty fermentation in the bales.

In addition to adequate cultivation of the meadows, the basis for hygienic fodder production lies in a grass cutting level of between 6 and 8 cm. When grass is cut more deeply, then the growth rate is slower, the contamination rate of the fodder higher and, especially when the ground is damp, the withering time is longer. Sufficient stubble-

length makes depth adjustment of hay turning machines easier, so that the work process ensures less contamination of the fodder.

The mown swaths should be spread out carefully as soon as possible following harvesting at a speed of between 4 – 5 kilometres per hour, thus enabling regular and fast grass withering. When the swaths are thicker, this meticulous spreading out of the grass can take place at an increased speed of between 6-7 km per hour. The drier the grass, the more crumbling when turning it over. For optimal consolidation the swaths should be regular in size and not too thick. Then the press, especially when it has a wide pick-up, can press regular consolidated bales, even at the edges.

Two completely different types of presses are in use. By the so-called constant, or non-variable, compression chamber press, the compression area, where the bales are formed, remains unchangeable. Bales from this type of press have a fairly loose bale core and a very dense outside, as the material is only consolidated at the final stage of the compressing, when the chambers are full. By comparison, presses with a variable compressing chamber continually thicken the material from the beginning of the process, using moving straps and harvesting chains. The pressing chamber adjusts itself to the various bale diameters. Presses of this type produce regularly consolidated bales with different diameters, when required. For stables with extremely low daily fodder usage, this method has obvious advantages. When compressing, the diameter of the bales can be adapted to suit the daily amount of fodder; by small rations the bale diameter can be reduced to 90 cm, enabling the storage time of the opened bale on the feeding table to be kept to a minimum. The dense core of the bale remains intact as silage is removed layer by layer. Due to this layer by layer removal of silage there is always a fresh cutting surface so that, given optimal storage conditions, the bale can remain on the feeding table for up to three weeks. Bales from presses with constant compression chamber volume can also be cut layer by layer, however there is higher risk of considerable amounts of air entering the fairly loose bale core

through the front end. The longer a bale must remain on the fodder table, the more vital it is that the core is dense. When a bale is consumed within a few days, then this variation in the risk of extra fermentation within round bales is not so important. Bales with loose cores are advantageous, particularly when the silage is damp, as they allow for easier portioning. This especially applies to presses from the Deutz-Fahr Company, which have a cutter behind the pick-up designed to cut harvest to a theoretical length of 74 mm. An experiment with this press in the year 1990, on the day previous to a demonstration, showed that extremely high bale consolidation could be achieved. The recorded variety of bale densities showed however, no effect on the quality of the silage.

Square bales have an approximate cuboid cross-section with a length of up to 1,60 m, a volume of about 1,0 m³, comparable to a round bale with a diameter of 1,0 m. By feeding of very small quantities it can be assumed that bales on the fodder table lose their density more quickly after the holding bands have been cut and that, therefore, silage durability is less than in round bales.

The bales should be wrapped as soon as possible after pressing as fermentation begins within a few hours. In order to prevent damage to the film, the bales should first be transported to their place of storage and then wrapped. The quality of the silage is not determined by the technical standard of the wrapping machine, but by the expertise of wrapping and the ample quantity of foil used. In the aforementioned experiment six different wrapping machines used four varieties of wrapping foil for the round bales. Neither machine nor film influenced the quality of the silage. A connection was, however, established between the amount of film used and the building of mildew within the bales. When reducing the wrapping amount of film by higher pre-stretching, then mildew developed on the outside of the bales and more fodder was destroyed. In the case of increased pre-stretch then more layers must be used to guarantee adequate protection of the silage. At a pre-stretch rate of 55% then at least four layers must be used and by pre-stretching up to 75%, five layers must be wrapped around the bales.

When the quality of the material is not ideal (very wet or extremely dry, brittle, spiky stems) it may be necessary to use an additional one or two layers of film.

Round bales should, ideally, be stored face up as the increased number of layers of film gives the necessary added protection from mechanical damage. When the dry material content of the bales is at least 40-45% and the bales are sufficiently non-deformable, they can be stacked. However it has often been found that mildew builds at the contact surfaces of the bales, especially on the sides exposed to weather, due to the presence of condense water. For this reason the bales should be stored individually in a dry shady place when possible. It is sensible to cover the bales with a tarpauline or a silage protection net to minimise the building of condense water and to protect from birds. To avoid unnecessary spoiling of the countryside the place for storage should be chosen with care, especially when white, strongly reflecting stretch film is used. This is particularly the case in tourist or suburban areas where non-farming communities frequently complain that the all too obvious bales spoil the scenery.

Conclusion:

The only possible silage feeding method for owners of up to twenty horses is the round bale wrapping method. In comparison to hay production, the advantages of silage feeding are: less dependence on weather conditions and the prevention of dust allergy to the horses. To ensure good quality silage the grass must be mown earlier, between development of the ears and blooming; grass must be withered to 40-50% dry material and extreme care must be taken when mowing, swathing, compressing and wrapping. The adequate thickness of the film is of great importance, especially when other factors are not ideal, eg. too wet, overly dry or old, brittle, stalky material must be wrapped. Round bales with dense cores are far more advantageous than those with loose cores when small amounts of silage are removed layer by layer, as they remain more stable to the end of usage. The round bales should be stored in a dry, shady, inconspicuous place. Additional protection from animals and minimised building of condense water is sensibly provided when covering the bales with a tarpauline or silage protection net.