



# IMPROVING THE QUALITY OF HAYLAGE FOR HORSES BY ADDING A BIOLOGICAL SILAGE ADDITIVE



Susanne Ohl & Ivan Eisner

## Introduction

- In Germany, extensively managed grassland is often first harvested when the grasses have a late stage of maturity.
- Physiologically old grass contains a high number of microorganisms.
- Conservation as haylage often leads to poor hygienic quality and low aerobic stability.
- Using haylage for horse feed requires low fructan levels to minimize the risk of laminitis. Fructan levels below 50 g/kg DM are considered harmless.



## Material & Methods

- Three year project with extensively managed grassland (2021-2023) harvested in mid-June
- Swath samples: nutritional value, water soluble carbohydrates (WSC), fructans, counts of molds, yeasts and lactic acid bacteria
- Baling: 5 untreated bales (CON), 5 bales treated with silage additive (SA; *Lactococcus lactis*, *Lentilactobacillus buchneri*)
- Estimation of DM losses and haylage samples for WSC, fructans, fermentation and hygienic quality, aerobic stability



## Results & Discussion

- Different wilting levels: lower in 2021 & 2023, higher DM range in 2022 like normally preferred by horse owners (Tab. 1)
- Fresh grass: high contents of crude fiber (307 g/kg), WSC (140 to 190 g/kg), fructans (38 to 78 g/kg), large numbers of molds and yeasts
- Haylages with reduced contents of WSC and fructans and good hygienic quality
- **High DM haylage** with minimal intensity of fermentation
  - Low contents of acids, no temperature rise during aerobic storage but deterioration by molds
- **Lower DM haylage** with higher intensity of fermentation
  - Inoculation led to higher contents of acetic acid, avoided malfermentation of Clostridia and yeasts and aerobic deterioration
- **Feeding:** no warming or visible spoilage and horses seemed to like the feed

**Tab. 1** Effects of ensiling without (CON, n=5) or with inoculation (SA, n=5) on haylage quality compared to the fresh grass (n=3). Comparisons were carried out using Kruskal-Wallis-test separately for the individual years.

Year	Variant	DM [g/kg]	Fructan	WSC	LA [g/kg DM]	AA	E	DM loss [%]	pH	pH <sub>out</sub>
2021	Fresh	573 <sup>a</sup>	63 <sup>a</sup>	176 <sup>a</sup>						
	CON	502 <sup>b</sup>	18 <sup>b</sup>	79 <sup>b</sup>	19	5 <sup>a</sup>	21 <sup>a</sup>	2.0	5.4 <sup>a</sup>	6.5 <sup>a</sup>
	SA	533 <sup>ab</sup>	19 <sup>b</sup>	68 <sup>b</sup>	20	14 <sup>b</sup>	6 <sup>b</sup>	1.4	4.7 <sup>b</sup>	4.6 <sup>b</sup>
2022	Fresh	739	78 <sup>a</sup>	190 <sup>a</sup>						
	CON	718	42 <sup>b</sup>	125 <sup>b</sup>	4	0.6 <sup>a</sup>	8	0.9	5.7	6.0
	SA	725	41 <sup>b</sup>	141 <sup>ab</sup>	4	1 <sup>b</sup>	5	0.6	5.6	6.2
2023	Fresh	575	38 <sup>a</sup>	140 <sup>a</sup>						
	CON	559	14 <sup>b</sup>	80 <sup>b</sup>	12	3 <sup>a</sup>	19 <sup>a</sup>	1.3	5.3 <sup>a</sup>	8.1 <sup>a</sup>
	SA	566	17 <sup>c</sup>	103 <sup>b</sup>	20	11 <sup>b</sup>	7 <sup>b</sup>	0.6	4.7 <sup>b</sup>	5.2 <sup>b</sup>

DM: dry matter, WSC: water soluble carbohydrates, LA: lactic acid, AA: acetic acid, E: ethanol, pH<sub>out</sub>: pH after aerobic stability test

## Conclusion

To produce high quality haylage for horses, grass should not be wilted too much. This way, lactic acid fermentation can still take place. With dry matter content up to 575 g/kg, the quality could be improved using a biological silage additive to the extent that undesired fermentation was avoided and the haylage was better protected against aerobic spoilage.

