

White Beach Farm – Haylage Report – January 2008

	Field 6436	Guideline level
pH	5.8	4.0 – 6.0
Dry Matter %	62.8	50-65
Ammonia % of N	2.4	Less than 8.0
NDF	67.4	55-70
ADF	39.4	32-39
Crude Protein %	9.2	7-12
M.E. MJ/kg	8.2	9-12
Protein Degradability	57.8	>65
Ash %	6.8	Less than 8.0
D value	51	>54
Total Ferm. Acids TFA	13.2	
Of which Lactic acid%	71	>65-70
Acetic acid%	3.1	1-3
Butyric acid%	<1	0.5-1.0
Ca	0.22	0.3 -1.0
Na	0.1	0.1-0.6
K	1.88	1.0-3.0
Mg	0.08	0.1-0.3
P	0.16	0.2 -0.45
S	0.15	0.15-0.45
Fe	34	150
Mn	153	30-115
Cu	3.7	2-10
Zn	15	12-40

Examination For Mould Spoilage – Results Field 1260

Test	Result	Units	Main species present
Moulds at 25 degrees C			None found
Moulds at 37 degrees C			None found
Moulds @ 25 degrees C	<10	CFU'g	
Moulds @ 37 degrees C	<10	CFU/g	
Total yeasts at 25 degrees C	<10	CFU/g	N/A
Total yeasts at 37 degrees C	<10	CFU/g	N/A
Thermophilic actinomycetes	<100	CFU/g	

Spore levels low no evidence of any aerobic spoilage

General Comments

Due to the bad weather conditions this haylage was cut as a 1st crop in August and the results are as expected.

Haylage

Examination for mould spoilage

Total and potentially pathogenic moulds are low at less than ten. The thermophilic actinomycetes are low at less than 100. Good fermentation will naturally inhibit thermophilic actinomycetes. The yeasts are also low so there should not be any white spots present.

Dry Matter %

62.8 This is fine. Dry matter or more importantly the amount of moisture has to be at the right level to allow full and thorough fermentation. More of this haylage will need to be fed to ensure Dry Matter intake, i.e. there is more water in this haylage than you would find in drier forage such as hay with a Dry matter of around 90%

pH

The pH of 5.8 is well within the expected range showing fermentation has occurred; and other parameters suggest it has been thorough.

Ammonia of N %

2.4

Higher levels are also found in wetter haylages. Higher than 8.0 shows that some microorganisms due to partial fermentation may be producing some ammonia through bacterial degradation of protein. At 5.8% production of ammonia by protein degrading bacteria appears not to have taken place indicating initial fermentation has been thorough and unwanted secondary fermentation has not occurred. Secondary fermentation allows bacteria which have not been killed off during fermentation to continue to break down protein thereby increasing ammonia levels. This may irritate the horses airways.

Crude Protein %

9.2% - Indicates crop is a first cut with lots of leaf.

Protein Degradability

57.8

This analytical method is used to determine the amount of heating that has occurred in the haylage sample. Heating in haylage occurs when wet forage is exposed to air. If this happens over a long period of time then severe heating occurs and protein becomes indigestible through the binding of plant sugars and protein. Protein degradability therefore gives the amount of protein available for digestion. Values greater than 65% show heat damage has not occurred.

Some heat damage may have occurred in this sample and this may affect palatability, but this is only a small amount and should not be of concern.

AD Fibre %

This is an assessment of fibre and figures of between 32-39% are common. The lower figure is found in younger meadow haylages and higher levels in more late cut and therefore mature seed haylages. AD Fibre of greater than 39% indicates less digestible, fibrous haylage often with lower levels of nutrients. The higher the ADF the lower the energy.

The AD Fibre of 39.4% is slightly higher than we would like but shows higher levels of fibre so typical of haylage cut later in the year. This is preferred for overweight horses and ponies.

NDF

A little high at 67.4 showing the material may be very slightly stalky again ideal for horses and ponies prone to be overweight.

Energy (ME MJ/kg)

Measurement of Metabolisable Energy, these energy levels are average at 8.2 MJ/kg. Haylage with a ME of less than 8.0 will not contribute significantly to the horse's daily energy intake. This haylage will provide some energy for working and breeding horses and ponies.

D Value %

This indicates digestibility and values of 54% or less indicates haylages are too fibrous and provide little nutrition, not the best choice for horses in hard work. The D value of this sample is 51%, which shows higher level of stalky material in this haylage, ideal for overweight types.

Lactic acid

71

Lactic acid is the most acidic of the common fermentation acids and is the main driver of the initial pH drop responsible for "pickling" the crop. It is produced by lactic acid bacteria which can vary tremendously in efficiency of production and in levels on the haylage crop. However lactic acid has no effect against yeasts and moulds beyond reducing pH and many common yeasts can use lactic acid to grow on. This lactic acid level is fine.

Acetic acid

3.1

This is the acid found in vinegar and has a strong ability to prevent growth of yeasts and ideally should be present at a reasonable level to prevent heating and spoilage. It is produced mainly by lactic acid bacteria. Acetic acid can be evidence of slow prolonged fermentation, however it can also be produced by anaerobic conversion of lactic acid to acetic acid.

Butyric acid

<1.0

This is fine. A high concentration of butyric acid (>0.5% of DM) indicates that the silage has undergone clostridial fermentation, which is one of the poorest fermentations. Silages high in butyric acid are usually low in nutritive value and have higher ADF and NDF levels because many of the soluble nutrients have been degraded. Such silages may also be high in concentrations of

soluble proteins and may contain small protein compounds called amines that have sometimes shown to adversely affect animal performance.

Yeasts

<10

Yeasts grow in the presence of oxygen but they can also grow in the absence of oxygen with ethanol being a major product along with acetic and butyric acids. Yeasts can use lactic acid for growth and generating heat. A yeast population of greater than 100,000CFU/g will almost certainly mean the haylage will heat as it is exposed to air during feeding. The yeast level of <10 CFU/g is fine.

Minerals

Most minerals fall within expected ranges apart from Manganese which is higher than ideal. High manganese levels can be found in more acidic soils and they may interfere with cobalt absorption. Calcium phosphorus and magnesium are lower than ideal and it is important these are supplemented by the hard feed or a mineral supplement when this haylage is fed as the only forage source.

Conclusion

This haylage sample shows good fermentation characteristics and nutritionally it is average. It is a high fibre haylage which is preferred for use for horses at rest or in medium work. It is advisable to feed plenty of it due to the moisture levels. There is no mould spoilage which is excellent.

ZOE DAVIES MSc.Eq.S.,R.Nutr.