

# Analysis Report

## Contact

Claire Davey	Analysis by Forageplus Ltd
Devon Haylage	Unit 10, Broncoed Business Park, Ffordd Nercwys,
Rill Farm	Flintshire, CH7 4AU Tel: 01352 700841
East Hill	
Ottery St Mary	Find our all our supplements including our low iron Forage
Devon	Focused Balancers at <a href="http://www.forageplus.com">www.forageplus.com</a>
EX11 1QH	

## Sample Details

Lab Reference:	FRG1431558 / 21159440
Sample Type:	HI FIBRE HAYLAGE
Sample Received:	05/12/2014
Order Number:	9846

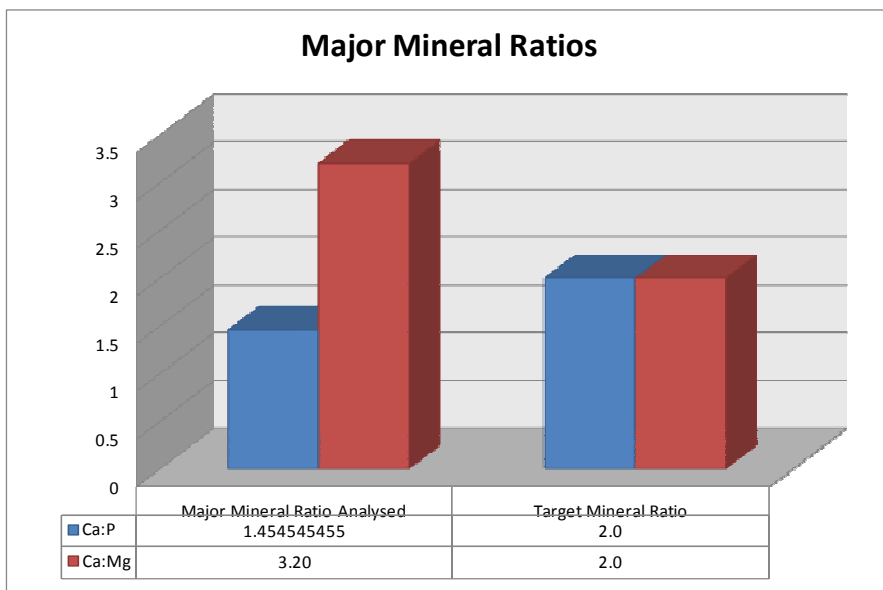
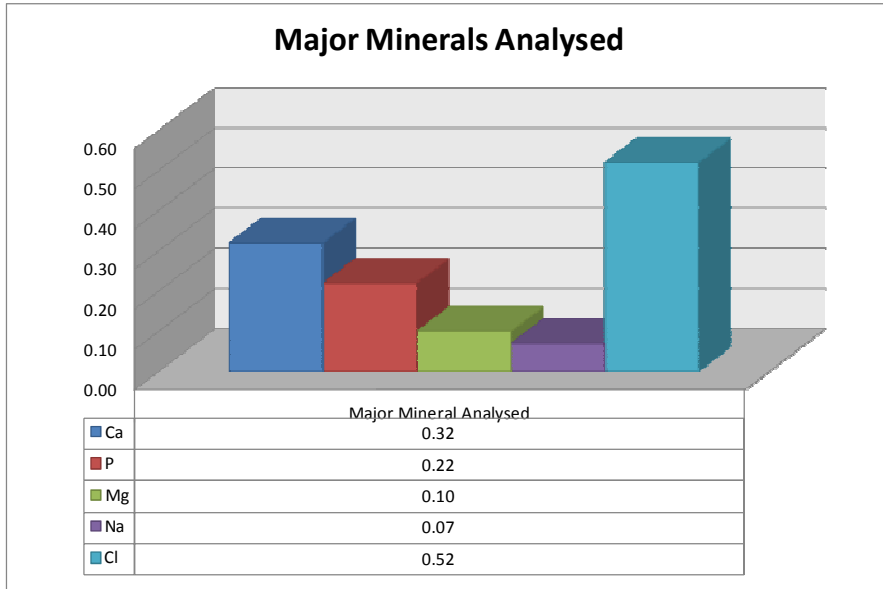
## Dietary Mineral Report

**If you have not ordered a mineral report all the values below will be reported as zero**

Dry Matter	Analysis	Units
Dry Matter	73.1	%
Major Minerals	Analysis	Units
Phosphorus	0.22	%
Magnesium	0.10	%
Calcium	0.32	%
Sodium	0.07	%
Potassium	1.99	%
Chloride	0.52	%
CAB	383.00	mEq/kg
Major Minerals	Analysis	Units
Manganese	93.90	mg/kg
Copper	4.00	mg/kg
Zinc	15.10	mg/kg
Selenium	0.04	mg/kg
Cobalt	0.04	mg/kg
Iodine	0.78	mg/kg
Antagonists	Analysis	Units
Lead	0.20	mg/kg
Iron	54.00	mg/kg
Aluminium	25.00	mg/kg
Molybdenum	0.91	mg/kg
Sulphur	0.07	%
Soil Contamination Index	Analysis	
SCI	3.00	

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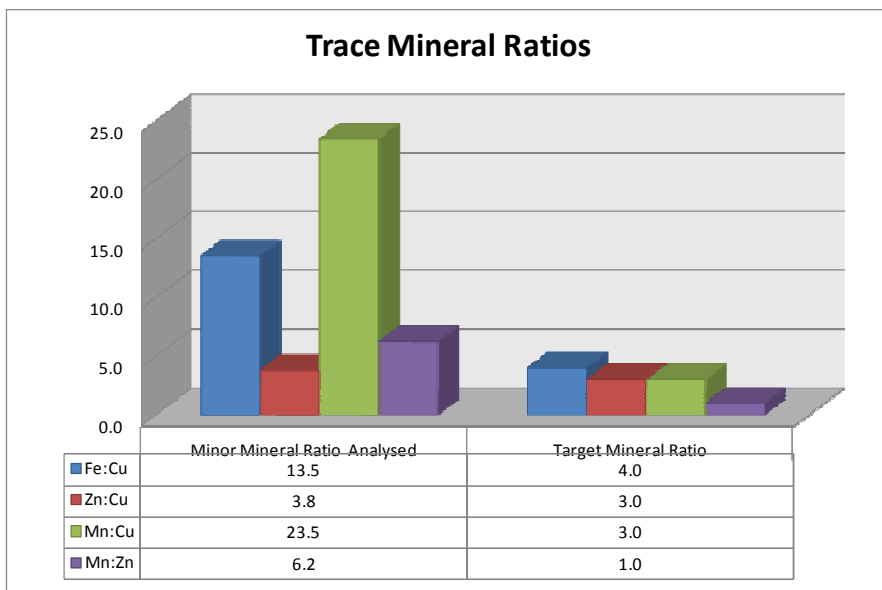
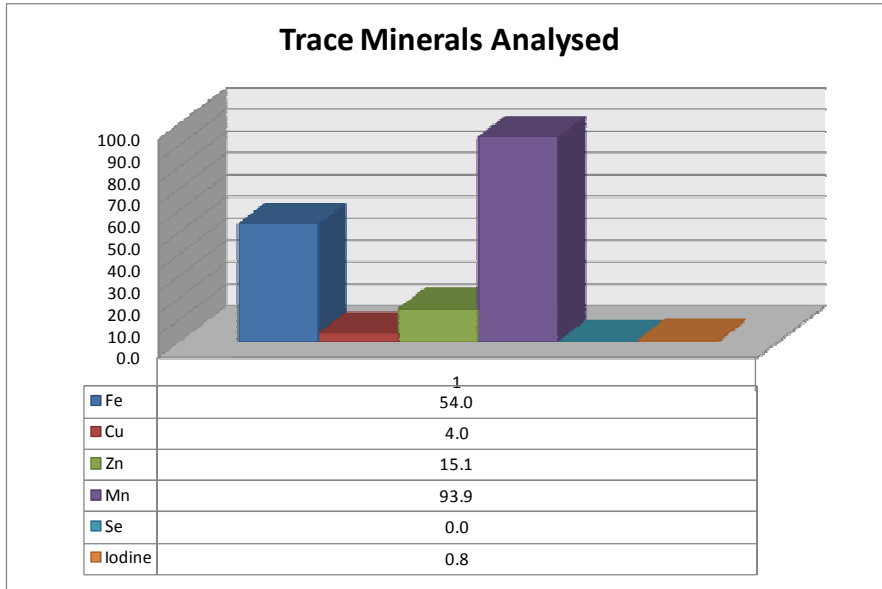
## Major Mineral Charts



Target mineral ratios for healthy adult horses are shown above. If you have a young horse, laminitic horse, performance horse, pregnant or lactating mare, then ratios of calcium with magnesium and phosphorous would need to be lower. Feeding the appropriate Forageplus Balancer or creating a bespoke Feed Plan would achieve improved ratios for maintenance and support of health.

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## Trace Mineral Charts



Target mineral ratios for healthy adult horses can range between 10:1 and 4:1 for iron : copper with the 4:1 ratio being the ideal. This is especially important in a young horse or a horse in heavy work. High ratios of iron and manganese are problematic because these *antagonist* minerals “block” the uptake of copper and zinc. The ideal ratio between manganese and zinc is 1:1. The antagonistic effect of iron and manganese will effectively lower the availability of copper and zinc and this is particularly important in forage already shown to have low levels of copper and zinc. The uptake of copper can be further compromised when the molybdenum level is more than 50% that of copper. It is extremely common to have iron : copper and manganese : zinc ratios above 20:1 this would

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indicate that feeding a Forage Focussed Balancer or a bespoke feeding plan is necessary to correct relative deficiencies as matched to forage.

## Nutritional Analysis Report

**If you have not ordered a nutritional report all the values below will be reported as zero**

Dry Matter	Analysis	Units
Dry Matter	73.1	%
Digestible Energy	Mcal/kg	MJ/kg
	2.23	9.34
Nutritional Analysis	%	g/kg
Crude Protein	8.6	86.0
Estimated Lysine	0.3	3.0
Acid Detergent Fibre (ADF)	35.1	351.0
Neutral Detergent Fibre (NDF)	58.3	583.0
Water Soluble carbohydrates (WSC)	20.6	206.0
Ethanol Soluble Carbohydrates (ESC)	10.0	100.0
Starch	0.4	4.0
Non-Fibre Carbohydrates (NFC)	23.9	239.0
Nitrogen / Sulphur Ratio	19.66	

**Digestible Energy** This is a measure of the energy available in your forage. In the UK this is measured in MJ/kg. A digestible energy content of around 8MJ/kg is average in the UK.

**Crude Protein** –This is a measure of the total protein in the sample including true protein and non-protein nitrogen. A protein level of around 8% is adequate; however protein levels in the UK are usually much lower than this. Where your report shows a poor protein level you should check the amount of forage fed is covering the protein requirements of your horse. The report does not inform about the individual amino acids that make up the protein in your hay. We have included a nitrogen/sulphur ratio which is an indication of protein quality. When the ratio of nitrogen /sulphur is above 10 then this indicates poor protein quality, so supplementation with methionine and other essential amino acids is recommended along with feeding other high protein sources such as copra, linseed or alfalfa.

**Lysine** – this is an estimated level and in the UK the average is usually lower than needed for maintenance of horses even on adlib forage. For this reason we recommend 10 grams of supplementation per day for an adult horse. Performance horses, pregnant and lactating mares and young horses will need even higher levels.

**Acid Detergent Fibre and Neutral Detergent Fibre** - These figures measure fibres (there are 5 types). The higher the ADF and NDF values are, the more lignin the hay contains and the more of this type of hay your horse will have to eat to maintain their weight. The ideal ADF value is less than 35% and

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the ideal NDF value is less than 45%. However, most hays have values that are 10% higher than these ideal levels. Levels 10% or more than the ideal level is not a problem but to compensate your horse will need to consume more of this type of hay.

**Water-Soluble Carbohydrates (WSC)** - This is a measure of the simple sugar *and* fructan levels in the forage. It has been thought in the past that fructan can contribute to laminitis; however the amount of fructan contained in forage has not been shown to be a problem so it is now thought the levels of simple sugar and starch are the values to be aware of when trying to control laminitis in horses.

**Ethanol-Soluble Carbohydrates (ESC)** - This is a subset of WSC *without* the fructan fraction and includes primarily monosaccharides and disaccharides. These simple sugars are digested in the foregut and raise insulin levels. Too much can lead to laminitis because of elevated blood insulin. The ESC measure gives you a much better idea of the simple sugar level. This combined with the starch level is the figure that you should be interested in when controlling laminitis in horses. Dr Kellon and the ECIR Cushings Group have found the ideal level for managing laminitic horses is an ESC and Starch combination of below 10%. Rinsing hay will reduce the sugar but you need to rinse in a specific way that is like washing detergent out of clothes.

**Starch** - This compound is normally digested in the foregut into individual glucose (blood sugar) molecules; therefore, it has a strong elevating effect on blood insulin levels. You cannot lower starch levels by soaking or rinsing hay or haylage. It is therefore wise to feed hay or haylage which is low in starch. As stated above it is wise to feed hay to IR/laminitic horses which has a *combined ESC and Starch amount of less than 10%*. Some horses will do better on an even lower percentage so experimenting with rinsing hay below the 10% level is also sometimes necessary.

### **Non Fiber Carbohydrates (NFC)**

This is a mathematical estimate of non-cell wall (non-fiber) carbohydrates consisting of starch, sugar, pectin and fermentation acids that can serve as energy sources for the animal. NFC is calculated as  $100\% - (CP\% + NDF\% + Fat\% + Ash\%)$ .