

No 148: Forage Mineral Averages 2010

Introduction

Consideration of the 2010 forage mineral results once again shows variation between years, forage types (cereal silages have a lower mineral content than grass silage) and individual farms. Whilst the trends in changing mineral contents outlined below identify the broad issues requiring attention, it is important to utilise individual farm data in the total ration in order to accurately balance daily mineral supply against animal requirements on a year-round basis. In this way, mineral deficiencies and excesses can be avoided and farm profitability maximised.

Mineral Trends

When comparing 2010 against the previous 3 year average, a number of factors are of interest:

Phosphorus

The average phosphorus content is lower this year by 5% and 15% in grass silage and cereal silages respectively. This may be a reflection of lower phosphorus output in slurry due to reduced phosphorus input through minerals and feeds closer matching daily requirement. Aluminium, which decreases the availability of phosphorus to the animal, is also significantly lower compared to previous years. Continued attention must still be given to ensure the dietary phosphorus balance is correct.

Cobalt

The average content of cobalt in silages is over 20% lower than the previous 3 years. This, like phosphorus, may be a reflection of lower and more accurate supplementation against livestock requirement resulting in less wastage in slurry. It remains critical to balance the requirement of 0.3 mg/kg DMI against total daily supply, as cobalt is required by rumen micro-organisms for fibre digestion.

A mixed ration would contain only 0.09 mg cobalt/kg DM from 50:50 grass:maize silage and as such requires supplementation with a farm mineral containing 60 mg/kg when fed at 100g per head per day. Clearly, cobalt supplementation is essential.

Selenium

The selenium content of all forages remains around 0.05 mg/kg DM. This is significantly below the daily requirement of 0.3 mg/kg DMI and therefore supplementation is essential.

Copper

This year's average copper contents of 4 to 8 mg/kg DM are below the 3 year average for each forage by approximately 3 to 20% which again may reflect on a more accurate approach to farm supplementation. With a minimum copper requirement of 12 mg/kg DMI for cattle, which is above that supplied by forage, ration balance is essential. Furthermore, when considering copper levels it is essential to also review the key copper antagonists, iron, molybdenum and sulphur, which reduce the availability of dietary copper.

The iron content has decreased, indicating less soil contamination at ensiling. The average iron level in all forages is significantly above the typical requirement of 40 mg/kg DMI, so no iron supplementation is needed. Furthermore, this year's results show that 27.58% of all grass silages contain greater than 250 mg/kg DM of iron, putting them in the high range and more likely to cause copper lock-up.

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Molybdenum has also decreased by some 5% and 25% in grass silage and maize silage respectively. However, 47% of grass silage samples contained molybdenum levels greater than 1.0 mg/kg DM placing them in the high range with the associated impact on copper availability, with the average of these samples being 1.83 mg/kg DM.

Sulphur, on the other hand, is little changed.

On balance, the lower average copper supply from the forages analysed in 2010 is offset by its higher livestock availability due to the lower level of antagonists.

In Summary

Averages show a trend but hide a wide range of results. It is always best to have the specific forages tested and feed a specially designed mineral to meet the animals' requirements in the most cost effective manner. Supplementation of livestock is essential to maximize year-round performance.

Further information can be obtained from the Frank Wright Trow technical department on 01335 341102. Receive these technical publications directly via e-mail link. Contact Sarah Brandrick to register your interest on 01335 341128 or at sarah.brandrick@frankwright.com. You can also access this and past CONTACT and URGENT NEWS publications by registering on our website: www.frankwrighttrow.com

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Grass Silage Mineral Averages

		2007	2008	2009	3 Year Average	2010	% Difference
Calcium	%	0.58	0.57	0.59	0.58	0.61	5.17
Phosphorus	%	0.3	0.31	0.31	0.31	0.29	-5.43
Magnesium	%	0.16	0.16	0.18	0.17	0.17	2.00
Sodium	%	0.28	0.25	0.25	0.26	0.23	-11.54
Potassium	%	2.29	2.36	2.35	2.33	2.38	2.00
Sulphur	%	0.19	0.19	0.19	0.19	0.19	0.00
Chloride	%	1.04	1.12	1.03	1.06	0.97	-8.78
CAB		293	282.8	300.35	292.05	317.04	8.56
Iron	mg/kg	368.95	328.86	337.27	345.03	246.74	-28.49
Manganese	mg/kg	98.4	106.57	102.79	102.59	85.22	-16.93
Cobalt	mg/kg	0.19	0.18	0.17	0.18	0.13	-27.78
Zinc	mg/kg	28.4	29.93	28.69	29.01	27.78	-4.23
Selenium	mg/kg	0.06	0.06	0.065	0.06	0.058	-5.95
Aluminium	mg/kg	228.29	252.02	248.61	242.97	145.51	-40.11
Lead	mg/kg	0.8	0.83	0.92	0.85	0.77	-9.41
Molybdenum	mg/kg	1.16	1.37	1.26	1.26	1.2	-5.01
Copper	mg/kg	6.8	7.24	6.54	6.86	6.61	-3.64
No of Samples		1154	1731	1177	1354.00	1240	

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Maize Silage Mineral Averages

		2007	2008	2009	3 Year Average	2010	% Difference
Calcium	%	0.28	0.24	0.24	0.25	0.26	2.63
Phosphorus	%	0.28	0.24	0.22	0.25	0.21	-14.86
Magnesium	%	0.14	0.12	0.13	0.13	0.14	7.69
Sodium	%	0.09	0.06	0.04	0.06	0.04	-36.84
Potassium	%	1.06	1.05	1.02	1.04	1.01	-3.19
Sulphur	%	0.11	0.09	0.09	0.10	0.09	-6.90
Chloride	%	0.32	0.32	0.3	0.31	0.32	2.13
CAB		154	146.58	136.23	145.60	130.63	-10.28
Iron	mg/kg	143.3	91.65	112.36	115.77	75.17	-35.07
Manganese	mg/kg	27.4	26.88	25.44	26.57	20.77	-21.84
Cobalt	mg/kg	0.08	0.1	0.05	0.08	0.04	-47.83
Zinc	mg/kg	25	27.75	24.75	25.83	24.45	-5.35
Selenium	mg/kg	0.05	0.05	0.05	0.05	0.05	0.00
Aluminium	mg/kg	68	44.16	63.84	58.67	33.57	-42.78
Lead	mg/kg	0.53	0.49	0.45	0.49	0.43	-12.24
Molybdenum	mg/kg	0.57	0.56	0.54	0.56	0.42	-24.55
Copper	mg/kg	7.1	5.38	4.46	5.65	4.56	-19.24
No of Samples		81	193	118	130.67	135	

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Whole Crop Mineral Averages

		2007	2008	2009	3 Year Average	2010	% Difference
Calcium	%	0.36	0.37	0.32	0.35	0.27	-22.86
Phosphorus	%	0.27	0.26	0.25	0.26	0.22	-15.38
Magnesium	%	0.12	0.12	0.12	0.12	0.11	-8.33
Sodium	%	0.07	0.09	0.07	0.08	0.05	-34.78
Potassium	%	1.38	1.31	1.23	1.31	1.11	-15.05
Sulphur	%	0.14	0.13	0.13	0.13	0.12	-10.00
Chloride	%	0.46	0.54	0.46	0.49	0.4	-17.81
CAB		163	144.37	128.93	145.43	119.69	-17.70
Iron	mg/kg	133.7	140.88	243.37	172.65	110.51	-35.99
Manganese	mg/kg	50.8	47.28	47.74	48.61	35.75	-26.45
Cobalt	mg/kg	0.07	0.08	0.11	0.09	0.05	-42.31
Zinc	mg/kg	23.7	30.77	26.21	26.89	22.76	-15.37
Selenium	mg/kg	0.045	0.06	0.05	0.05	0.054	4.52
Aluminium	mg/kg	67.4	79.89	188.62	111.97	39.65	-64.59
Lead	mg/kg	0.46	0.46	0.66	0.53	0.36	-31.65
Molybdenum	mg/kg	0.83	1.02	0.78	0.88	0.96	9.51
Copper	mg/kg	4.6	5.57	4.7	4.96	4.42	-10.83
No of Samples		40	62	71	57.67	51	

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Fresh Grass Mineral Averages

		2007	2008	2009	3 Year Average	2010	% Difference
Calcium	%	0.59	0.54	0.6	0.58	0.57	-1.16
Phosphorus	%	0.39	0.37	0.36	0.37	0.33	-11.61
Magnesium	%	0.19	0.18	0.19	0.19	0.18	-3.57
Sodium	%	0.22	0.17	0.14	0.18	0.21	18.87
Potassium	%	2.8	2.68	2.44	2.64	2.5	-5.30
Sulphur	%	0.28	0.24	0.28	0.27	0.26	-2.50
Chloride	%	1.17	1.13	1.1	1.13	1.27	12.06
CAB		308	289.68	202.22	266.63	207.59	-22.14
Iron	mg/kg	353.1	305.59	265.48	308.06	307.32	-0.24
Manganese	mg/kg	129.3	144.31	200.79	158.13	131.02	-17.15
Cobalt	mg/kg	0.21	0.18	0.14	0.18	0.36	103.77
Zinc	mg/kg	30.6	36.3	37.04	34.65	32.66	-5.73
Selenium	mg/kg	0.06	0.09	0.08	0.08	0.082	6.96
Aluminium	mg/kg	230.9	261.86	211.94	234.90	216.28	-7.93
Lead	mg/kg	1.23	2.38	0.94	1.52	0.86	-43.30
Molybdenum	mg/kg	2.08	4.59	2	2.89	2	-30.80
Copper	mg/kg	7.9	8.54	8.17	8.20	8.02	-2.23
No of Samples		74	114	60	82.67	90	