FORAGE MINERAL REPORT

MINERAL ELEMENT INTERPRETATION TABLE

Calcium (Ca)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Acid Soil. Under liming or light / organic soil.	Soil pH 5.5 – 7.0 Adequate lime status.	Alkaline Soil Over liming or naturally calcaerous soil
Cow Consequence	Acid soils are often poor sources of trace elements. Reduced Ca for milk production.	Optimal trace element uptake by grass.	Reduces trace element levels. Increases molybdenum.
Action	Test soil pH and lime.	None.	Test soil pH and avoid liming.

Phosphorus (P)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Light soils and inadequate fertiliser use.	Loam soil.	Heavy soils, and excess fertiliser use.
Cow Consequence	Inadequate forage supply. Poor energy utilisation in cow.	Ca:P ratio 1.5-2.0:1	Depresses calcium and magnesium absorption
Action	Test soil status and adjust fertiliser policy.	None.	Test soil status and avoid over fertilising.

Magnesium (Mg)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Light / organic soils Acid Soil.	Adequate soil status Neutral soil.	Heavy or naturally calcaerous soil. Alkaline soil.
Cow Consequence	Poor forage supply. Predisposition to staggers Milk Fever.	None.	Depresses phosphorus absorption.
Action	Test soil pH and status and use magnesium lime.	None.	Test soil pH and status and avoid lime. Increase P fertiliser.

Potassium (K)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Light soils and inadequate fertiliser use.	Loam soils.	Heavy soils and excess fertiliser use.
Cow Consequence	Deficiency rare. Beware high sodium diets, i.e. Soda Wheat.	K:Mg ration 5-6:1 K:Na ratio 6.0:1	Depresses magnesium uptake and can cause staggers and Milk Fever.
Action	Test soil status and adjust fertiliser policy.	None.	Test soil status and adjust fertiliser policy.

Sodium (Na) / Chloride (Cl)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Light well drained soils.	Loam soils.	Heavy soils, sodium - based fertiliser or close to sea.
Cow Consequence	Poor palatability of grass.	None.	Very high sodium levels can cause thirst and oedema.
Action	Introduce salt into fertiliser programme.	None.	Increase potash fertiliser applications.

Sulphur (S)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Reduced air pollution and low soil levels.	Adequate soil reserves.	High air pollution, soil reserves or use of S based fertiliser.
Cow Consequence	Very low intakes can depress rumen microbial protein synthesis. Skin/cell count problems.	None. N:S ratio 14:1	Acts with Mo to tie up Cu in rumen and cause infertility.
Action	Check soil status and use appropriate S based fertiliser.	None.	Check soil status and avoid use of S based fertiliser. Increase Cu levels in diets.

Iron (Fe)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Alkaline soils or light poorly mineralised soils.	Loam and well-mineralised soils.	Acid soils and soil contamination.
Cow Consequence	Low intakes and poor energy utilisation.	None Fe:Mn ratio 2.5:1	Causes Mn, Cu, Zn and Co deficiencies.
Action	Increase dietary supplementation and check soil pH.	None.	Avoid soil contamination at harvesting. Reduce dietary supplementation and check soil pH.

Aluminium (Al)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Alkaline soils or light poorly mineralised soils.	Loam and well-mineralised soils.	Acid soils and soil contamination.
Cow Consequence	None.	None.	Depresses phosphorus absorption. Can cause energy deficit.
Action	None.	None.	Check soil pH and avoid soil contamination. Increase P dietary level.

Manganese (Mn)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Alkaline soils or light poorly mineralised soils.	Loam and well-mineralised soils.	Acid soils and heavy soils.
Cow Consequence	Deficiency rare but poor fertility can result.	None.	Depresses Fe and Zn absorption.
Action	Increase dietary levels and check soil pH.	None.	Check soil pH and increase Fe and Zn dietary supplementation.

Zinc (Zn)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Alkaline soils or light poorly mineralised soils.	Loam and well-mineralised soils.	Acid soils and heavy soils.
Cow Consequence	Poor hoof growth leading to lameness. High cell counts in milk.	None Zn:Mn ratio 1.2:1 Zn:Cu ratio 4.0:1	Depresses Cu and Mn absorption.
Action	Increase dietary levels and check soil pH.	None.	Check soil pH and increase Cu and Mn dietary supplementation.

Cobalt (Co)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Alkaline soils or light poorly mineralised soils.	Loam and well-mineralised soils.	Acid soils. Soil contaminated forages.
Cow Consequence	Depressed vit B_{12} synthesis. Poor growth and milk production.	Ensure sufficient dietary supplementation.	High dietary levels can depress vitamin B_{12} synthesis in rumen.
Action	Check soil pH, foliar feed pasture and increase dietary levels.	None.	Check soil pH and supplement diet vitamin B_{12}. Minimise soil contamination.

Iodine (I)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Low soil status.	Loam, well mineralised soil.	Coastal soils.
Cow Consequence	Neonatal calf mortality. Poor fertility.	Ensure diets are supplemented at appropriate levels.	Excessive iodine intakes can depress fertility, cause abortion and result in excessive milk levels.
Action	Supplemement diets.	Supplement diets.	Adjust diet supplementation to forage level.

Copper (Cu)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Alkaline soils or light poorly mineralised soils.	Loam and well-mineralised soils.	Acid soils or heavy soils.
Cow Consequence	Poor fertility and energy utilisation.	None.	Depresses Zn and Mn absorption. Toxicity can occur at high intakes.
Action	Check soil pH and increases dietary levels.	Ensure dietary supplementation is balanced against antagonists.	Check soil pH and increase Zn and Mn dietary supplementation.

Molybdenum (Mo)

Mineral Status	Very Low - Low	Mean	High – Very High
Cause	Acid soils or well-drained soils.	Loam and well-mineralised soils.	Alkaline or poorly drained soils.
Cow Consequence	None.	None. Cu:Mo ratio 20-30:1	Poor fertility and also ties up Cu in the rumen.
Action	Check soil pH, but avoid over use of lime.	Ensure copper supplementation is appropriate for the level of Mo.	Check soil pH and avoid use of lime to maintain slightly acid soil. Aerate soils.