

## MINERALS

- 7 major minerals
  - Ca, P, Mg, K, Na, Cl, S
- 8 Trace minerals
  - Se, Cu, Zn, I, Mg, Mo, Co, Fe

### Vitamins

- B, C, K – can be synthesised by ruminants
- A, D, E – need supplementation

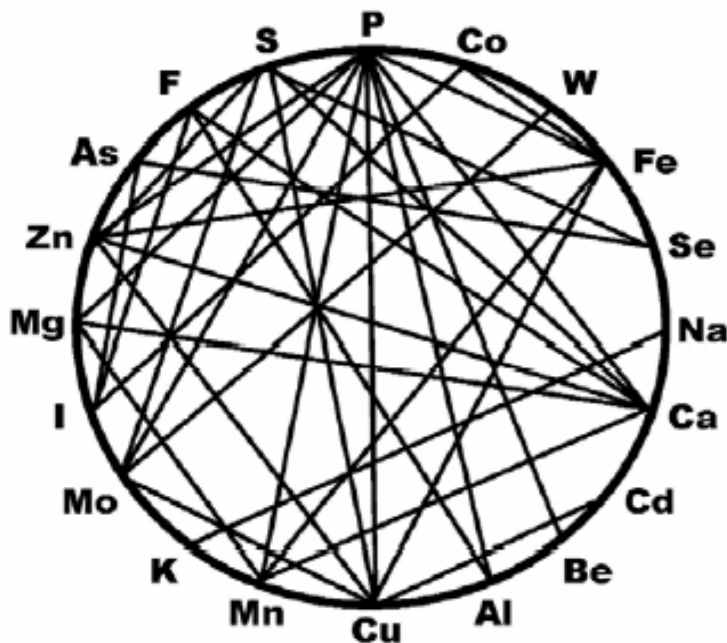
### Major Minerals

- Ca – Milk yield, bones growth, milk fever, muscle function, enzyme systems
- P – Milk yield, bone growth, fertility
- Mg – Milk, bone formation, enzymes, grass tetany
- Na – Reduced appetite, milk yield

### Trace Minerals

- Cu – swayback, ↓ LWG, infertility, scouring, retained placenta, hair colour
- Zn – ↓ LWG (↓ appetite, ↓ FCE), lameness
- Mn – ↓ Fertility, ↓ LWG, leg deformities, delayed oestrus
- I – ↓ Fertility, abortions, retained placenta
- Co – pinning, loss of BW, Vit B12
- Se – Retained Placenta, reproduction, muscle degeneration
- Mo & Fe – Cu antagonists

### Mineral Interaction



### Why are minerals important for the individual animal Nutrition

- They support production, milk and meat,
- Help maintain a healthy animal,
- Involved in reproduction,
- Ensure energy and protein are metabolised efficiently.

### Pre Calver Mineral

- Building the cows body reserves of essential trace elements quickly
- Arming cow against calving difficulties
- Preparing defence against metabolic disorders during lactation
- Ensuring adequate supply for transfer to unborn calf
  
- **Magnesium** – Commonly added at 15 grams per cow per day (15% in a 100gram feeding rate).
- **Sodium** – 15 to 20 %.
  - To improve palatability
  - Improve absorption of magnesium
- **Phosphorus**
  - Target level in the total dry matter is 0.25%. Most silage's contain this in background.
  - Addition may have a negative effect where hypocalcaemia is an issue

### Role of Vitamins and minerals

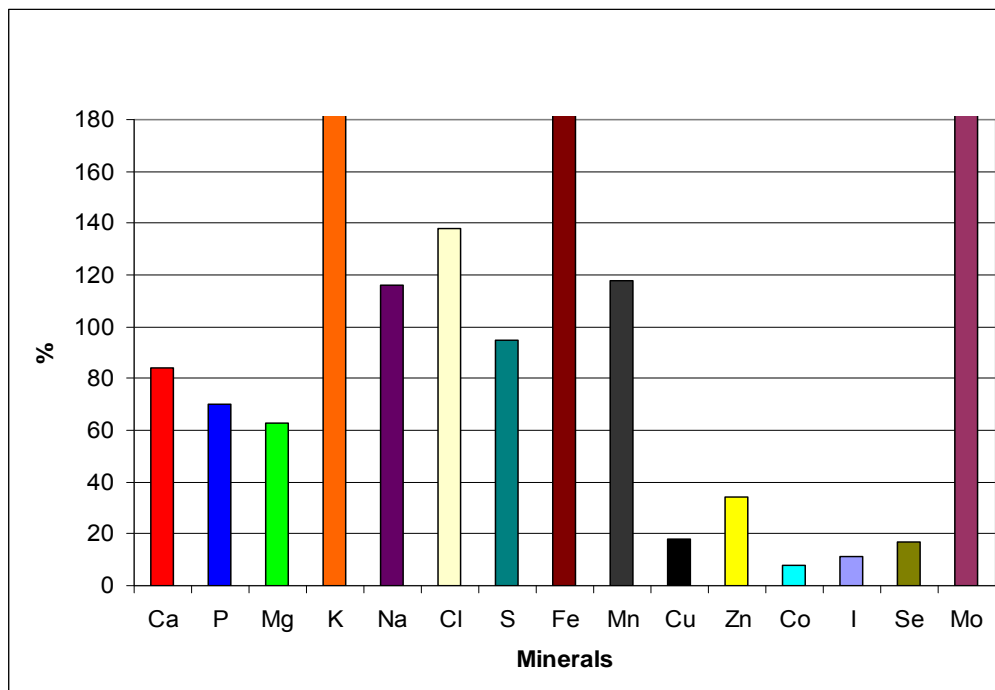
Vitamin A	Foetal development, immunity
Vitamin D3	Calcium metabolism
Vitamin E	Immune function
Selenium	Peroxydases – anti-oxidant's, reproductive disorder's, disease Resistance. Conversion T4 to T3
Iodine	Controls metabolism and other hormones (T3)
Copper	Many enzyme/hormone systems – Fertility, health metabolism
Zinc	Many enzyme/hormone systems, Appetite, Skin, reproduction, Immune system
Manganese	Many enzyme/hormone systems, Lipid metabolism, reproduction, cartilage development, blood clotting
Cobalt	Metabolism (B12), appetite suppression, lipid metabolism,

## Pitfalls Pre-calving

- Not feeding a pre-calver mineral
- Not being properly fed
- Not feeding minerals for long enough
  - Feed for at least 8 weeks
  - Longer may be desirable if addressing a specific problem
  - Argument for feeding some level through out a long dry period
- Poor quality mineral
  - Bioplex
- Hypocalcaemia – calcium deficiency (usually as a result of high Potassium)
- Not addressing historical problems in a systemic matter, not properly diagnosing the problem, not implementing the solution.

## Post calving

### Grass as a source of minerals



Silage + Concentrates	Alternative Forages	Grass Based system
Macros well Balanced	Macros often meet only 50% of requirements	Macros O.K.
Trace elements OK where 6KG + Concentrate fed	Trace elements O.K	Trace elements usually low- low level of concentrate being fed
Check Magnesium Where using TMR	Where used get a printed diet sheet showing levels in the total diet fed	Consult your feed supplier re feeding rate

### **Pitfalls Post Calving**

- Adequate trace elements not fed at grass
- Poor supplementation of macro's when using alternative forages
- Mineral level does not match the feeding rate.
- Molybdenum toxicity – spring grass is high in molybdenum, need to make sure we have adequate copper in the diet to prevent absorption.
- Systematic thought not given to how minerals are going to be fed from drying off to late summer.