

Minerals and Feed additives for pre-conditioning and cow herd

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General Functions of Minerals

- Constituent of bones and teeth
- Constituent of organic compounds
- Activation of many enzyme systems
- Energy metabolism
- Growth and development
- Function as soluble salts
 - Osmotic control
 - Acid base balance
 - Electrolyte balance

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Macro Minerals

Minerals that are required in the diet in percentage amounts

- Calcium - Ca
- Phosphorus - P
- Magnesium - Mg
- Potassium - K
- Sodium - Na
- Chlorine - Cl
- Sulfur - S

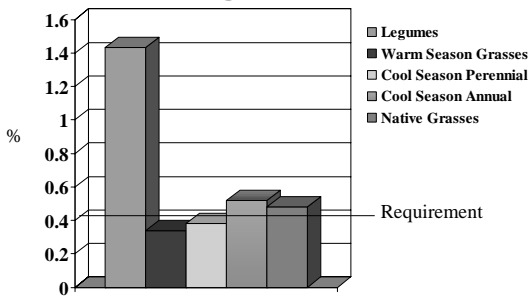
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Calcium

- Calcium can be low in forages grown on acid soils
- Several factors interact with Calcium to prevent absorption - Vitamin D, Organic acids, Phosphorus
- Calcium deficiency causes downer cow (milk fever)

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Forage Calcium

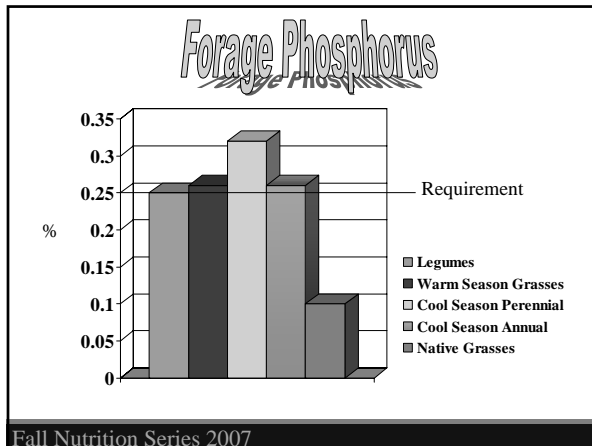


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Phosphorus

- Important for energy metabolism
- P deficient cow will have depraved appetite
- **P deficient cow is thin in body condition**
- **P deficient cow has reproductive failure.**
- Phosphorus deficiency is not as likely when grazing improved fertilized forages.

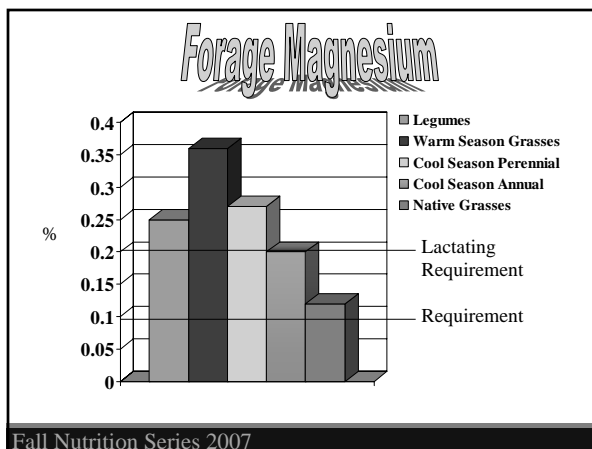
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Magnesium

- Deficiency (Grass Tetany) often occurs when cows graze lush green winter pastures immediately after calving
- Occurs more often in older cows
- Occurs in highest producing cows
- Deficiency not likely to occur in stocker cattle

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Potassium

- High in green forages
- Low in dormant forages
- Interacts negatively with Mg
- Increased needs for stressed/shipped calves
- Critical in calculating Dietary Cation Anion Balance

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Sodium

- Supplied as NaCl
- Base of most mineral supplements
- Forages generally low with respect to requirement
- Excess Na can increase in pasture soils and reduce plant growth.

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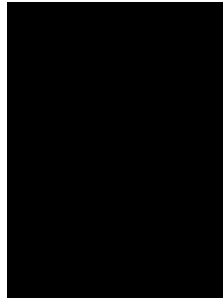
Sulfur

- Interacts negatively with Cu
- Can be found as high in certain water sources
- Can be high in forages due to S fertilization
- Requirement is about .15% of diet DM.
- High levels may induce polio, interactive with thiamin.

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General Functions of Trace Minerals

- Collagen formation
- Pigmentation
- Antioxidant
- Hormonal function
- Component of enzymes
- Enzyme metabolism
- Enzyme activity
- Wound healing



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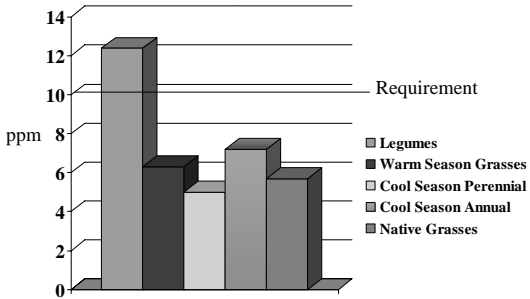
Micro Minerals

Minerals required in the diet in parts per million amounts

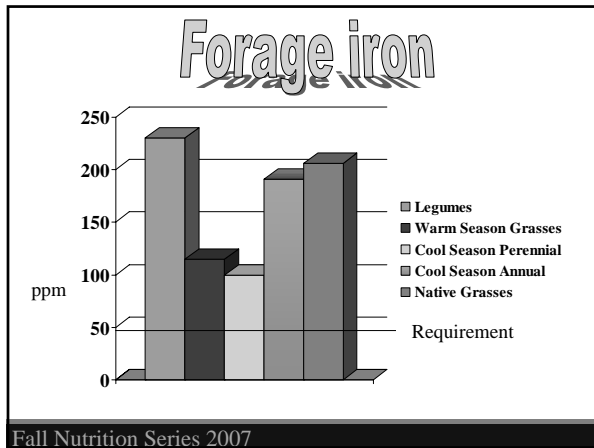
- Cobalt - Co
- Copper - Cu
- Iodine - I
- Iron - Fe
- Manganese - Mn
- Molybdenum - Mo
- Selenium - Se
- Zinc - Zn

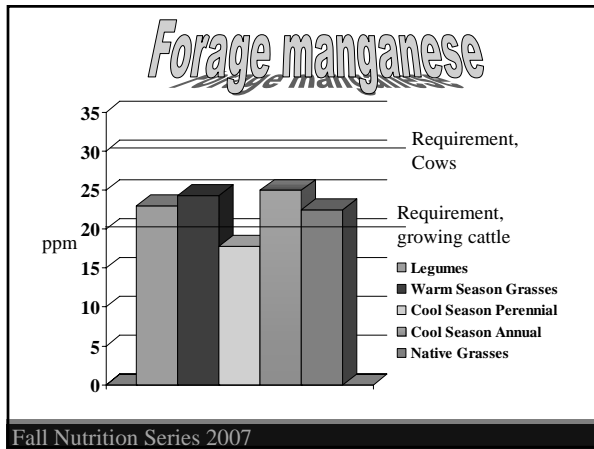
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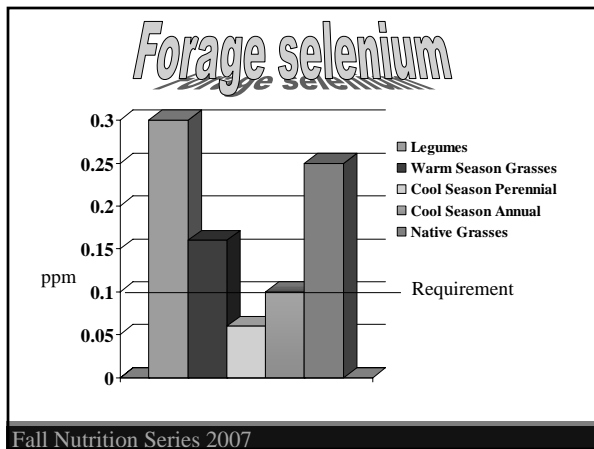
Forage copper

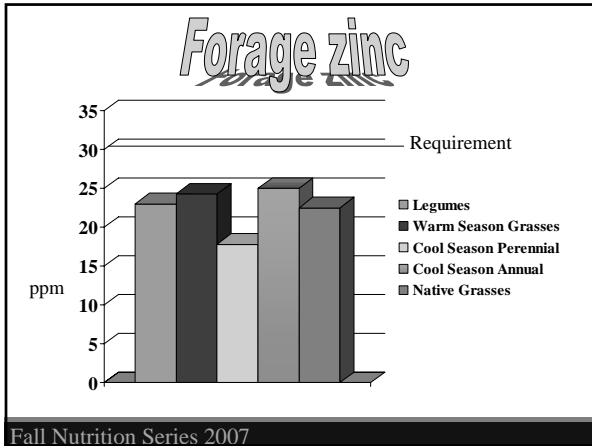


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Trace minerals likely to be deficient in grazing animals

- Cobalt - Co
- Copper - Cu
- Selenium - Se
- Zinc - Zn

McDowell et al. (1993)
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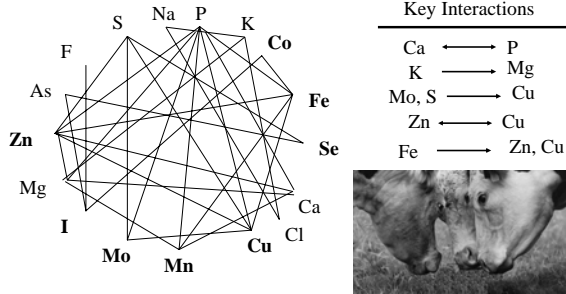
Trace minerals that can be toxic

- Copper - Cu
- Iron - Fe
- Molybdenum - Mo
- Selenium - Se

DANGER

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Mineral Interactions



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Sources of Minerals

- **Feedstuffs** – Best place to get them
- **Supplement** – Intake becomes an issue
 - Inorganic salts
 - For trace minerals – select sulfate form
 - Organic salts (Chelated)
 - More expensive

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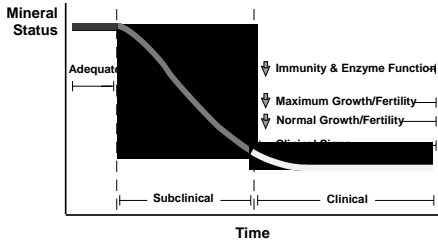
Mineral Supplementation

Is it a 'FEEL GOOD SYNDROME'?

- Feed free choice loose salt
- No sulfur block (yellow) needed
- Do not feed white salt separately
- Protect from weather
- Maintain fresh supply

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EFFECTS OF DECLINE IN TRACE MINERAL STATUS



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Mineral recommendations

High Quality Summer Pasture or Hay, Well Fertilized
Intake = 1 oz/cow/day

	%		%
Calcium	-	Iron	-
Phosphorus	-	Manganese	.5
Potassium	-	Zinc	1.6
Magnesium	-	Copper	.5
Salt	80+	Iodine	.016
Sulfur	-	Selenium	.01
		Cobalt	.007

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Mineral recommendations

Bermuda Pasture or Hay, Fertilized
Intake = 2.2 oz/cow/day

	%		%
Calcium	15	Iron	-
Phosphorus	6	Manganese	.3
Potassium	-	Zinc	.8
Magnesium	5	Copper	.25
Salt	<15	Iodine	.01
Sulfur	-	Selenium	.004
		Cobalt	.003

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Mineral recommendations

Native Pasture or Hay, Non-fertilized

Intake = 2.2 oz/cow/day

	%		%
Calcium	12	Iron	-
Phosphorus	12	Manganese	.4
Potassium	-	Zinc	.8
Magnesium	4	Copper	.2
Salt	<15	Iodine	.01
Sulfur	-	Selenium	.004
		Cobalt	.003

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Mineral recommendations

Grass Tetany Prevention Annual Winter Pasture

Intake = 2.5 oz/cow/head

	%		%
Calcium	16	Iron	-
Phosphorus	2	Manganese	.4
Potassium	-	Zinc	.8
Magnesium	10	Copper	.25
Salt	15-25	Iodine	.01
Sulfur	-	Selenium	.004
		Cobalt	.003

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Feed Additives for Preconditioning

- Ionophores
- Yeast (live or killed)
- Mineral sources (chelated vs inorganic)
- Although not a feed additive - implants

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