



# Relations

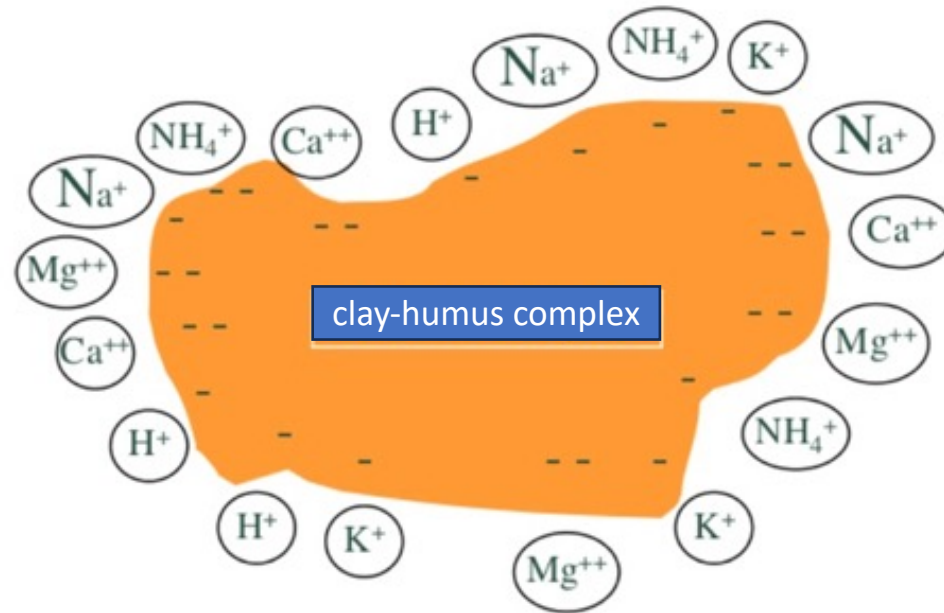
in feeding for skeleton and claw development and skin resilience

Gerrit Hegen, 16 october 2024

Soil-plant-animal-human relations

Elements soil	Role in de plant	Role in animals (cattle, soil life)	Role in human beings
N = nitrogen	Building up protein, celldevison en celstretching, (growth), enzymes, making chorophyl	Protein (source of aminoacids for growth and recovery of tissue), enzymes	Protein (source of aminoacids for growth and recovery of tissue), enzymes
P = phosphorus*	Energycarrier, building stone of DNA, building up protein, development of roots, youthgrowth	Energymanagement, buildingstone of DNA, bones (keep in mind role of vitamin D), activity of rumenmicrobes in ruminants	Energymanagement, function in muscles, buildingstone of DNA an bones (keep in mind role of vitamin D),
K en Na = potassium and sodium	Liquidbalance in the plant, droughteresistence, metabolism, growth	Liquidbalance in the body, acid-base balance, enzymes energymetabolism, stimulus transmission	Liquidbalance in the body, acid-base balance, enzymes energymetabolism, stimulus transmission
Ca = calcium	Celldevison, stabilising of cellmembrans, stableness of cellwalls, decreasing activity of enzymes which break down cellwalls, element of quality	Bones, stimulus transmission muscle-nerve, hormones, coagulation, pH regulation bloodtogether with P (keep in mind role of vitamine D)	Bones, stimulus transmission muscle-nerve, hormones, coagulation, pH regulation bloodtogether with P (keep in mind role of vitamine D)
Mg = magnesia	Builing up chlorophyl, role in assimilation/photosynthesis, stimulates plantdevelopment	Bones, stimulus transmission muscle-nerve, activation of enzymes, production of PTH => metabolism	Bones, stimulus transmission muscle-nerve, activation of enzymes, production of PTH => metabolism
S = sulfur	Proteinproduction and -quality: sulfur containing aminoacids cysteine, lysine and methionine (essential aminoacids)	Protien with essential aminoacids as building stone for growth, development and body maintenance, thiamine (B vitamin), insulin	Protien with essential aminoacids as building stone for growth, development and body maintenance, thiamine (B vitamin), insulin
Cu = copper	Plantdevelopment/growth, photosynthesis, enzymeactivity, seedsetting (forming of pollen and seed).	Production of red blood cells, pigment, activation of enzymes, skeletondevelopment, breeding/reproduction	Production of red blood cells, good working of immunesystem en coagulation, pigment, activation of enzymen, skeletondevelopment
Zn = zinc*	Enzymes, growth hormone (Auxine), chlorophyl , resistance	Building up protien, growth and renewal of tissue i.e. bones, skin, hair, enzymes of the metabolism, defence, immunensystem	Building up protien, growth and renewal of tissue i.e. bones, skin, hair, enzymes of the metabolism, defence, immunensystem
Co = cobalt	Part of van enzymes and co-enzymes, part vitamin B12	Rumenfunction, vitamin B12, part of enzymes, co-enzymes	Vitamin B12, part of enzymes, co-enzymes
J = iodine	Growth, early blooming, photosynthesis, resistance (ereduction of stress)	Thyroxine, development and vitality of the calf, fertility	Thyroxin, needed for good growth and development of the nervous system, fertility
Se = selenium*	Antioxidant, stress toleracie, as by drought.	Antioxidant via enzyme glutathionperoxidase (Gsh-Px), iodinemetabolisme (thyroid gland)	Antioxidant via enzyme glutathionperoxidase (Gsh-Px), iodinemetabolisme (thyroid gland), detoxication in the liver
Fe = iron	Enzymes, chlorophyl	Red bloodcells (hemoglobin), oygentransport, making of antibodies	Red bloodcells (hemoglobin), oygentransport, making of antibodies

\* = restricted worldsupplies



Cation exchange capacity of the soil

# An underestimated fact

Youngstock in the pasture on the first of june: two weeks before from stable to fresh pasture (lattermath)....

What do you see?



# What do you see at this animal?

- A little x-bony stand
- heavy underfeet (phalanx) en thickened growth plate distal longbone (arrow)
- crooked growing off the medial claw
- **Risk factor:**  
*inadequate vitamin and mineral supply in stable rations with silage given to young stock between 1 and 2 years.*



# Do you realise....

- Low protein quantity and protein quality: negative for growing plate
- Low Ca, P, Cu, Mn and/or biotin en vitamin D: negative for skeleton development (predisposition of joints and clawbones) and disturbance of (claw)hornformation
- Low Zn, Se en vitamine E: less resistance of the clawskin against infections as digital dermatitis
- The basis for claw problems in the lederen animal is laid here laid.
- But also general resistance is established by ration and vitamin- and mineral supply.
- Factor udder cleft dermatitis: the same and possibly oedema due to imbalance of Na en K



# Ration youngsters Kregel Dairy

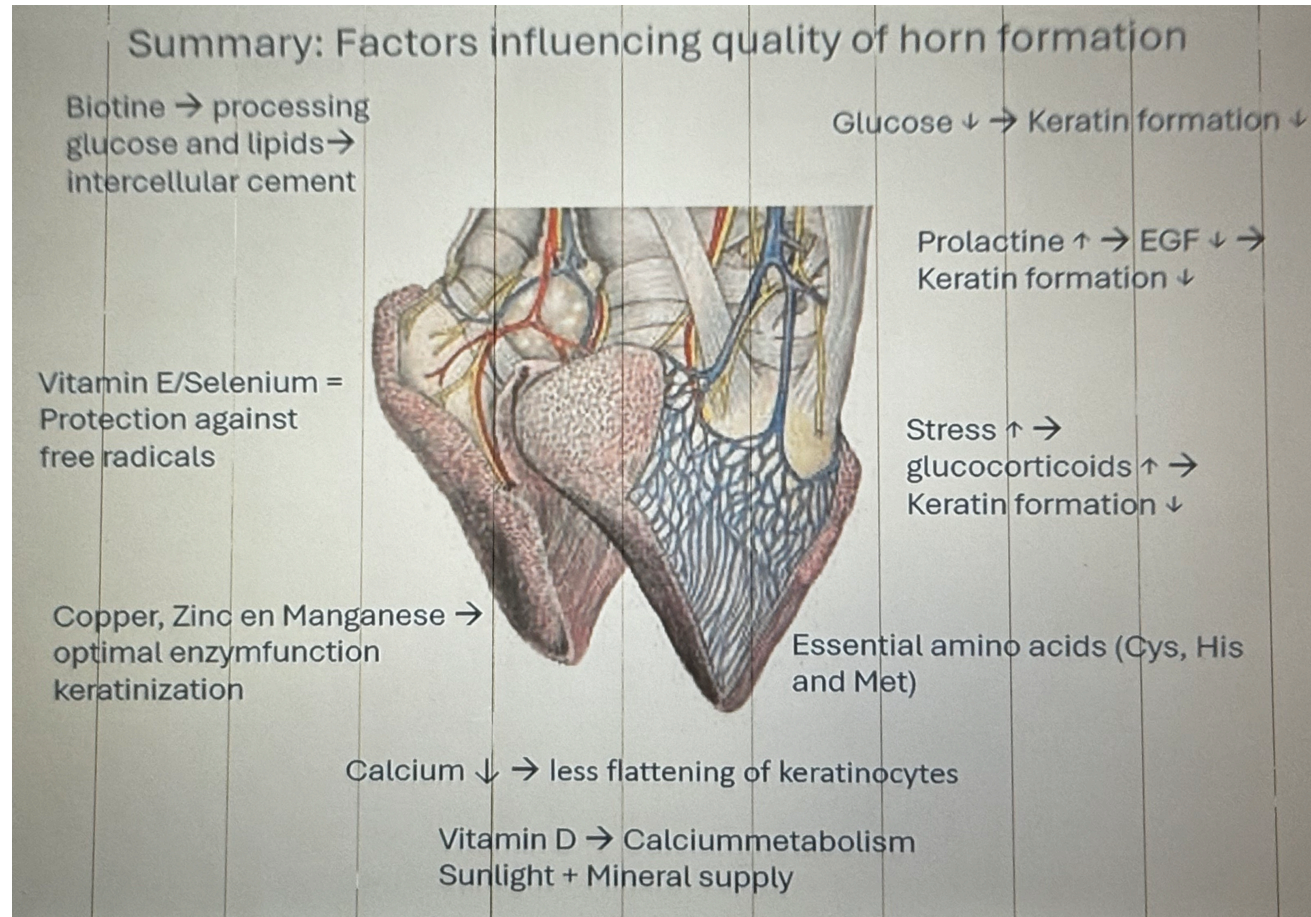
- Hay of Italian rye-grass
- Clippings of old grazing pastures
- Concentrates of milking cows

***What do you think about this and what do you see in the barn?***

Indication of requirements					
	Milking cows	Dry cows far off	Dry cows close up	Young stock <1 year	Young stock > 1year
Total ration					
DM intake		15	12	11.4 tot 6	8
VEM need		980-800-850	800-850	750-800	
VEM norm		105	100	100	100
DVE		85-55-65	55-65		70
OEB		15-100-200	100-200		0
Rough protein		150-12 of 13	12 of 13		
Starch (total g/kg DM)		180-1200 g per dag	1200-1500 g per dag		
of which rumen undegradable	50-60				
Sugar g/kg DS	tot 70				
P g/kg DS	3,4*	<3	<3	3,2-3,5**	3,2-3,5**
Ca g/kg DS	4,7-7	2,8-4,5*	2,8-5,5*	4-7**	4-7**
Mg /kg DS	2,4-4,5	2,1-5	2,1-6		1,8
S g/kg DS		2	1,5	1,5	1,5
NDF		450			
ADF		300			
ADL		20			
FOS		550			
RC		240			
RFAT		50			
RAS		80			
Na mg/kg DS		1,2-0,6-2,0	0,6-2,0		0,55
K		7,5-5-20	5-20		4,5
Cl		2,5	0,8	0,8	0,6
Cu		12-12-25,2	12-25,2		15
Co	0,3-0,5	0,3-0,5	0,3-0,5	0,3-0,5	0,3-0,5
J		0,5	0,5	0,5	0,5
Zn		28-25,2-100	25,2-100		27
Mn		40	40	40	25
Fe		10	31,4	31,4	75
Se		0,17-0,13-0,4	0,13-0,4		0,11
Vitamine A i.e.	3500-5000/kg DS	3500-5000/kg DS	3500-5000/kg DS	3000-4000/kg DS	3000-4000/kg DS
Vitamine D i.e.	1000-2000/kg DS	20000/koe/dag	25000/koe/dag	300-500/kg DS	300-500/kg DS+1000 (hoogdrachtig)
Vitamine E i.e.	750-1500/koe/dag	1500/koe/dag	2000/koe/dag	35 i.e./kg DS	35 i.e./kg DS



# Broader relations from the presentation of Erwin de Heer



# Success of rearing young stock

- Capacity of the farmer on rearing young stock from 1-2 years with his own silage, hay or pasture grass with even slight correction of vitamins, minerals and trace elements.
- In that sense:

*good quality of young stock in the broad sense is an excellent figure for good management of soil and plant on the farm.*

