

Cafeteria-Style Mineral Feeding

**“How and Why to Feed
Ground-Up Rocks to Animals
for Fun and Profit.”**

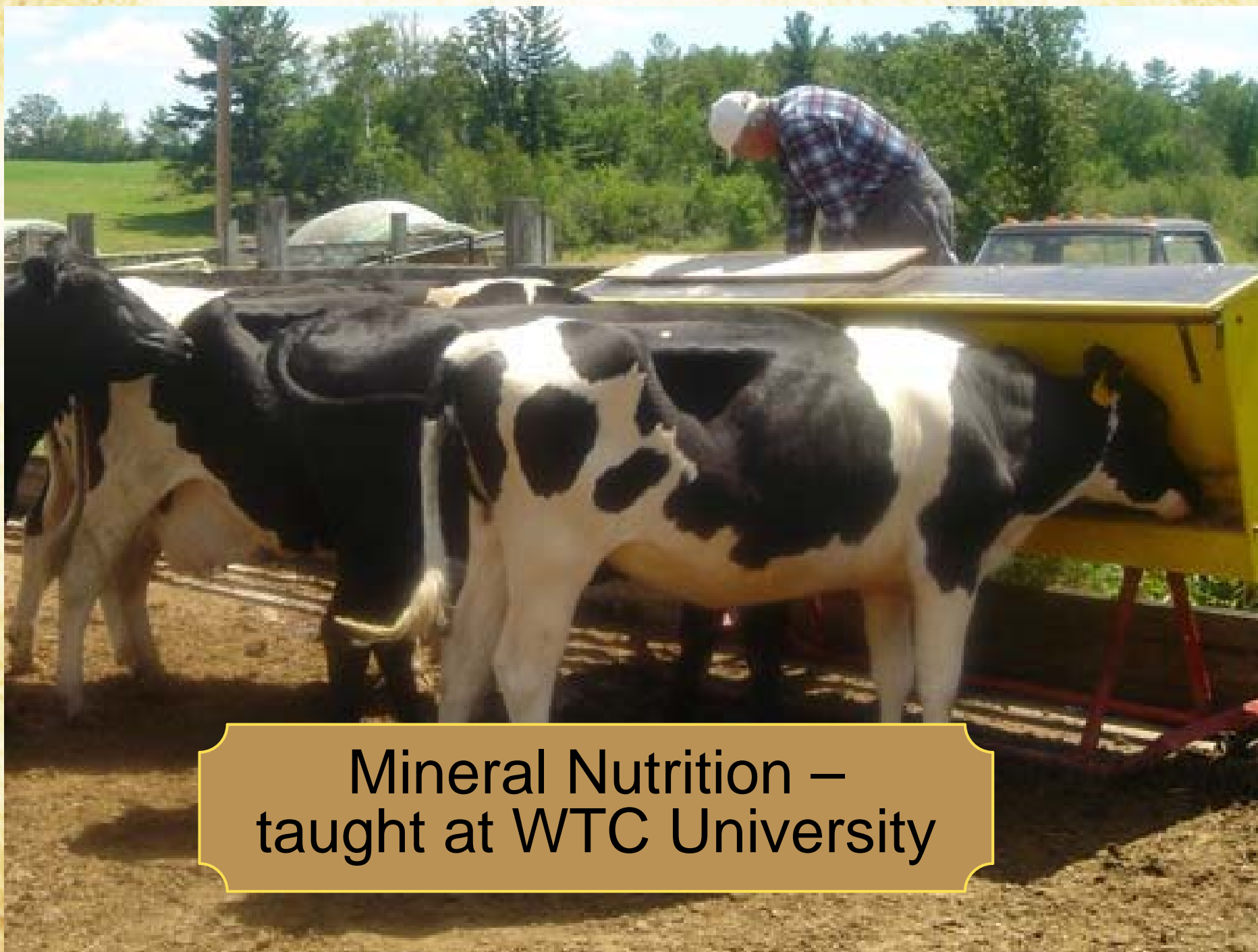


Wm. A. Albrecht, PhD
1888 - 1974

Albrecht's Adage

“Observe nature
and study books,
if they don't agree,
throw away
the books.”

The Father of Modern Soil Science



Mineral Nutrition –
taught at WTC University



“The health of
soil, plant, animal
and man is one
and indivisible.”

Sir Albert Howard
1873 -1947

The Founder of
Modern Organic Agriculture



He wrote: “I have several times seen my oxen rubbing noses with foot-and-mouth cases. Nothing happened. The healthy, well fed animals reacted to this disease exactly as suitable, properly grown varieties of crops did to insects and fungus pests – no infection took place.”



Eugene M. Poirot
1899 - 1988

“I don't know how to
"cure" these many
diseases - but
Mother Nature
does. That is why I
like to give her the
"tools" and keep her
on my side.”

“Our Margin of Life”

published in 1978

A Brief History of Cafeteria-Style Mineral Feeding

Dr. Albrecht was one of the first to propose animals could choose superior nutrition. See “The Other Side of the Fence.”.

Building on Albrecht’s concept, Talbot Carlson, Inc was started in 1957 by two men from Missouri. The company was successful, but was dissolved when Tully Talbot passed away.

A few years later, Bill Johnson, the General Manager of the old TCI company, resurrected the concept of individual free choice minerals and continued to develop and refine the technology under the logo of IDM.

“No two animals have the same mineral needs and no one bag of minerals meets all animal requirements.”

Bill Johnson

In 1988, Helfter Enterprises, Inc., dba Advanced Biological Concepts, started manufacturing the product line for IDM. Eventually, Bill Johnson retired and Advanced Biological Concepts purchased IDM. and continues to be the premier supplier of individual free-choice minerals and the supporting technology.

RESEARCH

“Reductionist” Thinking

Discovering more and more
about less and less
until finally they know
everything about nothing!

Linear or Conventional



Holistic



Sanborn Field

University of Missouri at Columbia



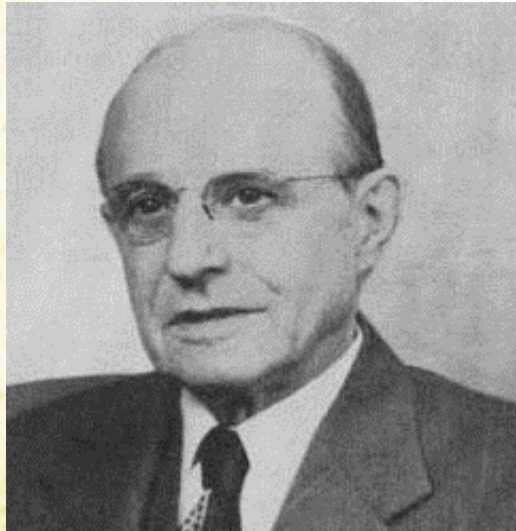


A Scottish physician, biologist, pharmacologist and botanist. His best known discoveries are the enzyme lysozyme in 1923 and the world's first antibiotic substance benzylpenicillin in 1928. Penicillin was developed by Howard Florey, Ernst Chain and Norman Heatley. Fleming, Florey and Chain received the Nobel Prize in 1948.

Sir Alexander Fleming
1881 - 1955

Fleming discovered very early that bacteria developed antibiotic resistance whenever too little was used or when it was used for too short a period.

Penicillin's success ignited a search for additional antibiotics. Pharmaceutical companies solicited samples of soil or mold from around the world.



Benjamin Duggar
1872 - 1956

Lederle's chief pathologist, Benjamin Duggar, asked a former colleague at the University of Missouri to send him some random dirt samples.

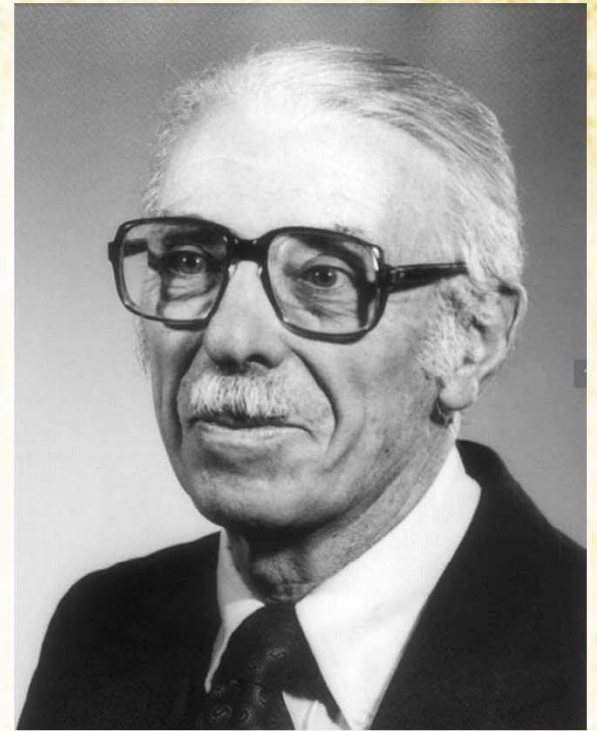
A sample from Sanborn field, contained a bacterium that exuded a golden-yellow chemical. In tests, the compound killed a wide array of disease bacteria.

American Cyanamid filed for a patent in 1948 for Aureomycin – chlortetracyclin - the first broad spectrum antibiotic.

In 1948 Thomas Jukes added 60 grams of the leftover aureomycin substrate to the feed of a group of chicks. The effects on growth rate and production were astounding. He shared the results with friends..

That event opened the door for CAFO's and changed the basic structure of agriculture in most of the world.

It was also the start of our problem with antibiotic resistant bacteria.



**Thomas H. Jukes
(1903-1999).**

By 1947, a hospital in London was experiencing an outbreak of staph infections that did not respond to penicillin.

By 1953, the same resistant bug sparked an epidemic in Australia.

In 1955 it crossed to the United States, infecting more than 5,000 mothers who had given birth in hospitals near Seattle and their newborns too.

Those illnesses marked the start of the lethal game of leapfrog that organisms and antibiotics have engaged in ever since.

In 1977 a study was done at
South Dakota State University entitled:

“Cafeteria Style Free-Choice Mineral Feeder
for Lactating Dairy Cows”

by L. D. Miller, L. V. Schaffer, L. C. Ham, and M. J. Owens.
1977 J Dairy Sci 60:1574-1582

In the summary the authors stated:

“Little evidence was found that dairy cows
offered minerals and vitamins free choice
consumed to a specific appetite or need under
the two nutritional regimes.”

- ◆ 2 groups of 10 mid-lactation cows/group.
- ◆ Trial ran for 16 weeks.
- ◆ Forage was either corn silage or alfalfa hay.
- ◆ All supplemental minerals and vitamins were provided free-choice. Intake measured weekly.

- ◆ Mineral and Vitamin mixes were:

| | |
|------------|---------------------|
| Calcium | Trace Minerals |
| Phosphorus | Vitamins A & D |
| Potassium | Bicarbonate of Soda |
| Magnesium | Sodium Bentonite |
| Sulfur | Sodium Chloride |
| Iodine Mix | |

“Intake of phosphorus, potassium, and vitamins differed between rations. A higher free choice intake of phosphorus by cows fed alfalfa was not expected.”

“Cows could possibly have been consuming more P to narrow the wide Ca:P ratio due to high Ca intake from alfalfa.”

“Cows fed corn silage consumed more potassium free-choice, but additional intake still was needed to meet requirements.”

The authors could not explain why this group's milk production exceeded the alfalfa group even with their assumed K deficiency.

“Little evidence was found in these two short trials that lactating dairy cows have a specific appetite for individual minerals.”

“ ... only in the cases of potassium and vitamins did cows fed corn silage consume large amounts free-choice possibly to compensate for a dietary deficiency.”

Given the above perspective,
it's difficult to understand how
the authors concluded that
cattle could not balance their
own mineral needs.

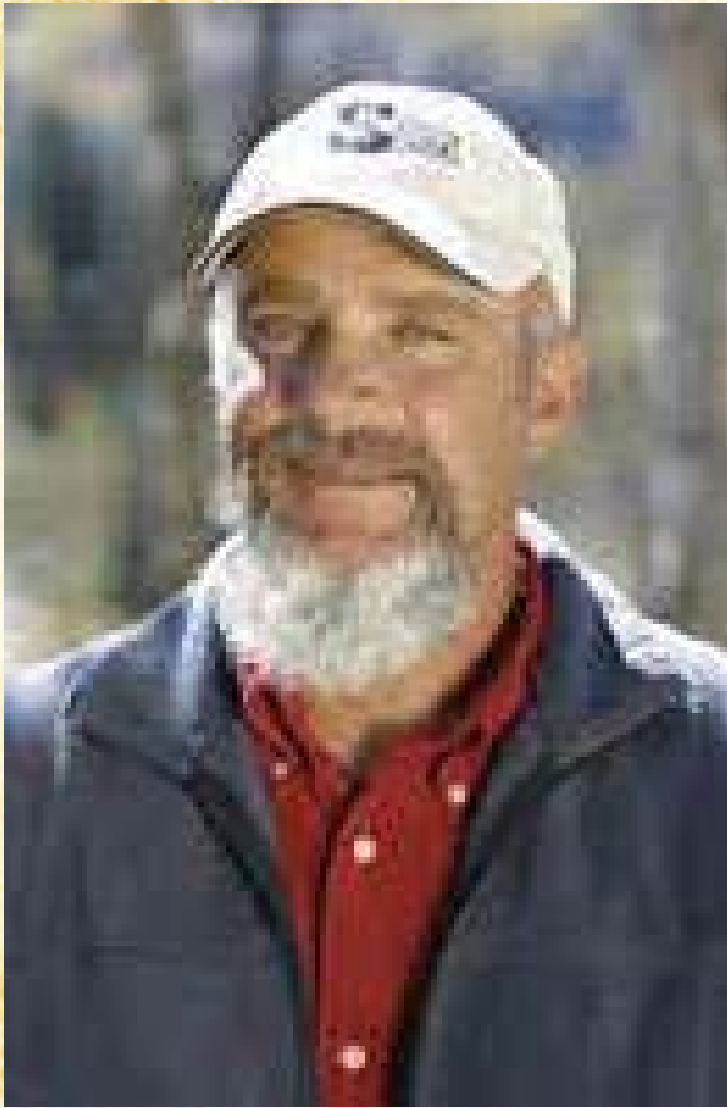
I wonder who paid for the
research grant?

Cafeteria-style Research conducted at Cornell by water-quality expert Dave Beede has been published in the Journal of Dairy Science.

Researchers set up a series of water tubs **cafeteria-style**, with different iron concentrations so they could see which tubs the cows preferred.

Lactating dairy cows tolerated iron concentrations of 4 ppm without a reduction in water intake; however, water intake was reduced with concentrations of 8 ppm.

They also indicated the laboratory livestock suitability water analysis underestimated the amount of (bound) iron in the water.



Fred Provenza, Ph.D.

“The Web of Life”

A Ph.D. in Range Science.

Currently is Professor Emeritus
in the Department of Wildland
Resources at Utah State
University.

Author or co-author of 250
publications in peer-reviewed
journals and books

BEHAVE:

<http://extension.usu.edu/behave/>

"All of us who are turning increasingly to alternative medicine will find this book particularly compelling . . . Absolutely enthralling."

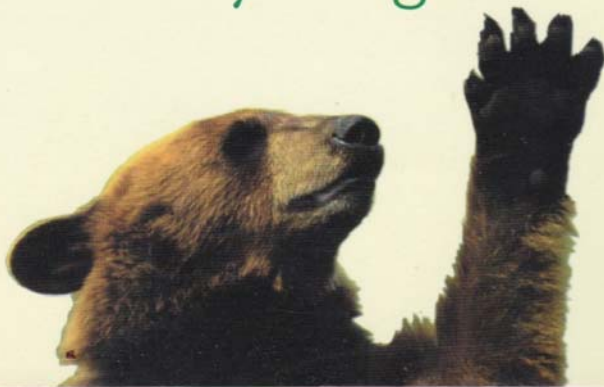
— JANE GOODALL

*Lessons in
natural wellness*

*from the
animal kingdom*

wild health

Cindy Engel



Animals have the ability to regulate their nutrition and even to self-medicate, if given the chance.

Fencerows and woodlots are a grazers pharmacy. Weed growth concentrates some elements.

Zoopharmacognosy:

Refers to an animals innate ability to seek out plants and herbs that possess healing compounds.

Derived from the root words zoo ("animal"), pharma ("drug"), and gnosy ("knowing").

The Need for Mineral and Trace Mineral Supplementation



Linus Pauling
1901 – 1994

The only person
to ever win
two unshared
Nobel prizes.

"You can trace
every disease
and every
infection to a
mineral deficiency
from unequally
yoked energy
fields."

Could
that really
be true ?



Consider this:

All domestic animals
today suffer from 4
main problems that
affect mineral balance.

1 Soil Depletion

... results in lower nutritional value of crops.

2

Varying degrees of confinement

... allow less
nutritional diversity.

3

College Educated
Feed Company

Nutritionists

... who recommend excess
protein and force fed minerals.

4

Contamination of
our soils, crops and
feeds with toxic
insecticides,
GMO's, and
herbicides such as
glyphosate.



Mineral
deficiencies
are difficult
to correct.

Mineral Balance is Essential

Either excesses or deficiencies can have serious metabolic side-effects. For example, high Iron ties up Copper, Cobalt, Manganese and Zinc ... all essential to immune response.

RUBES®

By Leigh Rubin



No two
animals
have the
same
needs.

All soils
differ in
mineral
content.

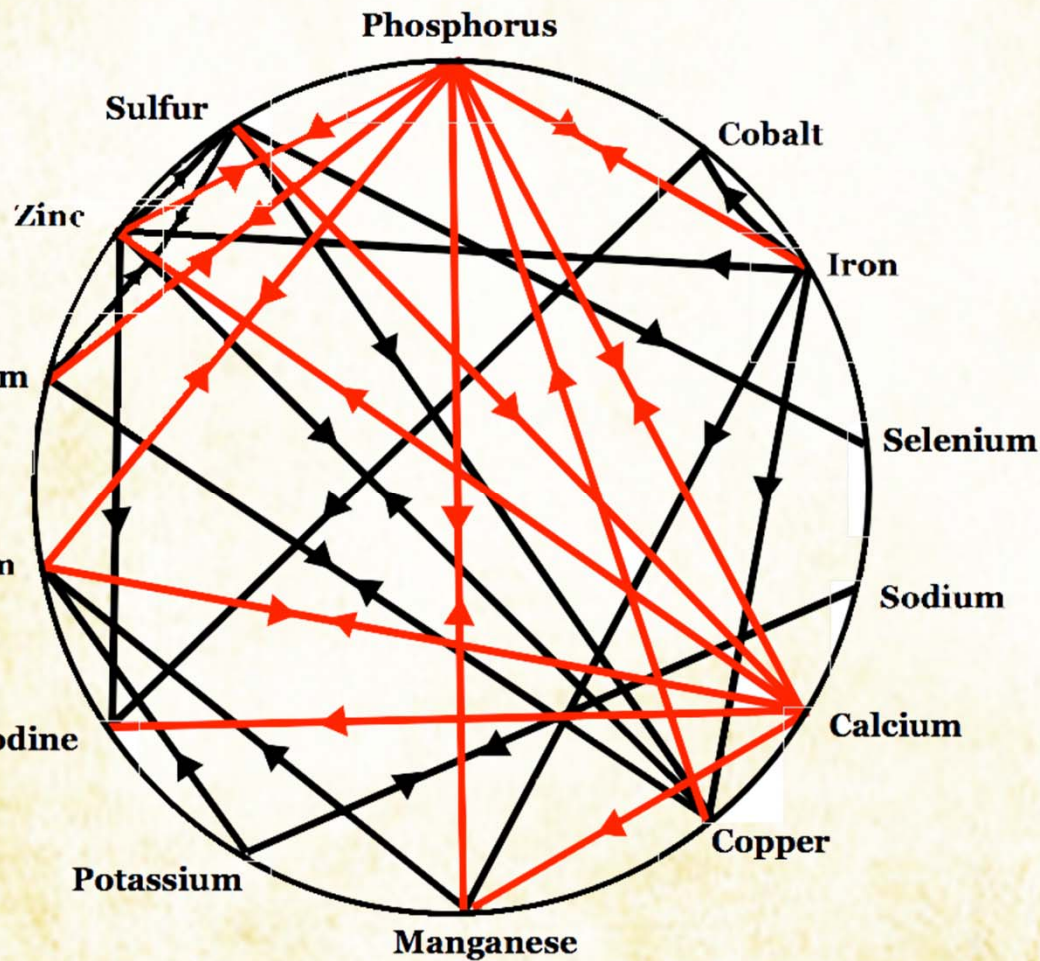
Mineral Wheel

Mulder's Wheel

Illustrates the
complexity of mineral
interrelationships.

The Mineral Wheel

Commonly Accepted Mineral Interrelationships in Animals



How to Interpret the Mineral Wheel

An arrow pointing from one element to another indicates that an excess of the mineral from whence the arrow originates may interfere with the absorption or metabolism of the mineral to which the arrow points.

For Example: An excess of Calcium may interfere with the utilization of Zinc.

Two major elements, Calcium and Phosphorus, (shown in red), affect the utilization of most other elements.

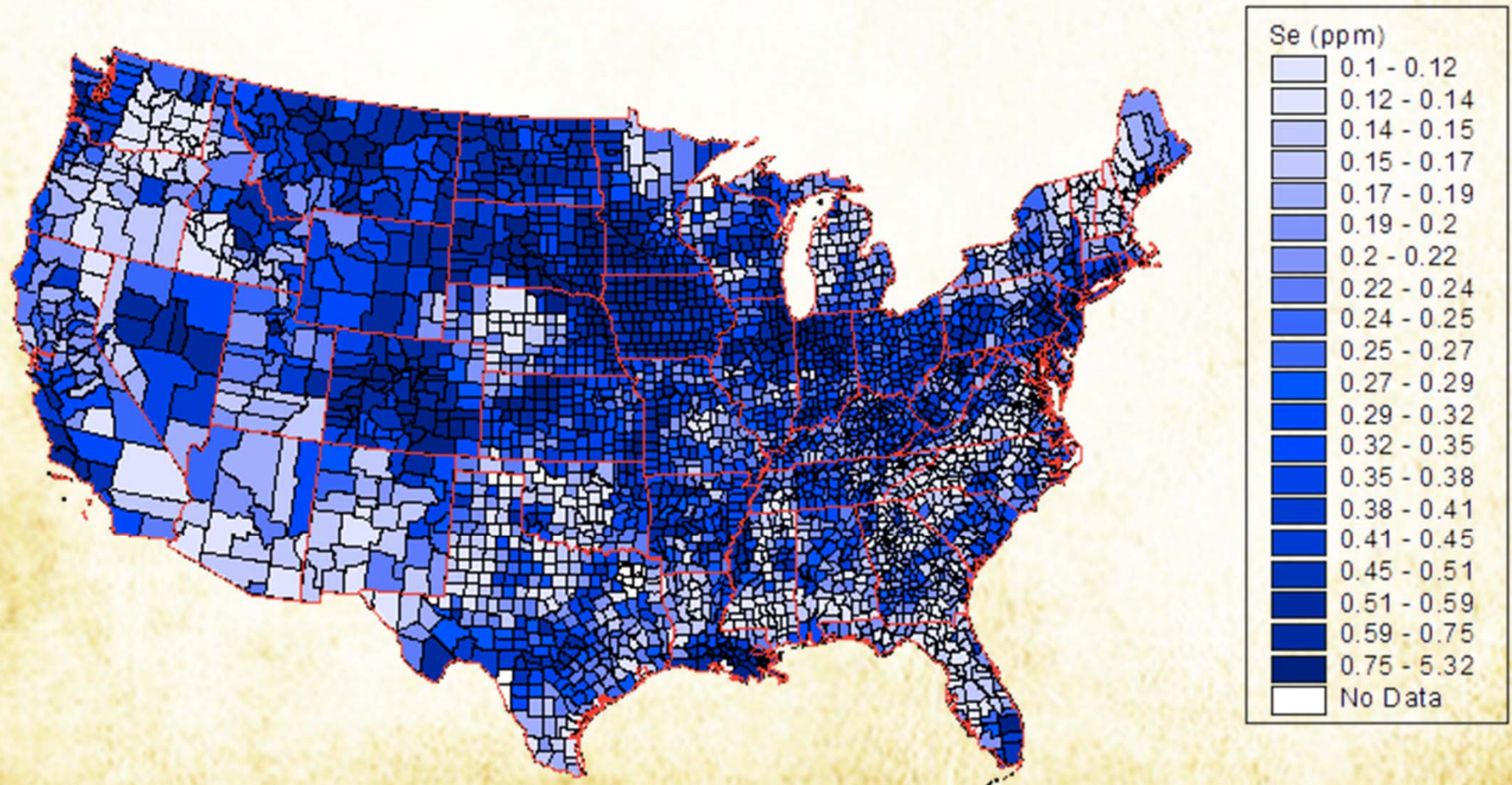
A mineral cannot be affected without affecting at least two other minerals, each of which will affect two others and so on.

There is a great
variation in mineral
concentration in soils
across the country.

Using Selenium as an example

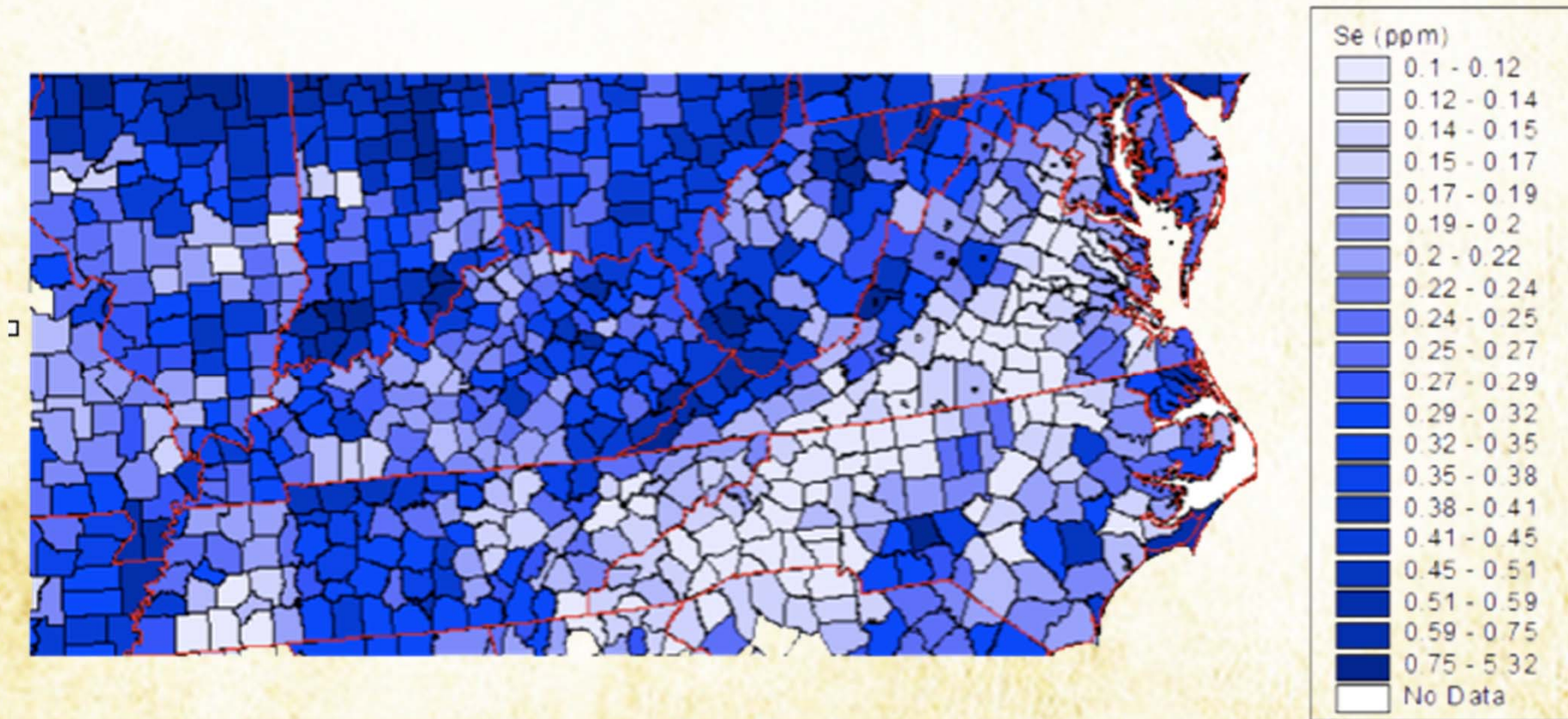


Selenium in Counties of the Conterminous States



- and zeroing in on regional amounts.

Selenium in Counties of the East-Central US

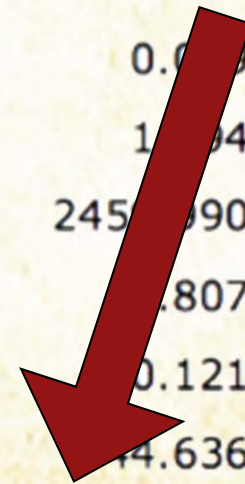


... finally the
differences in each
individual county.

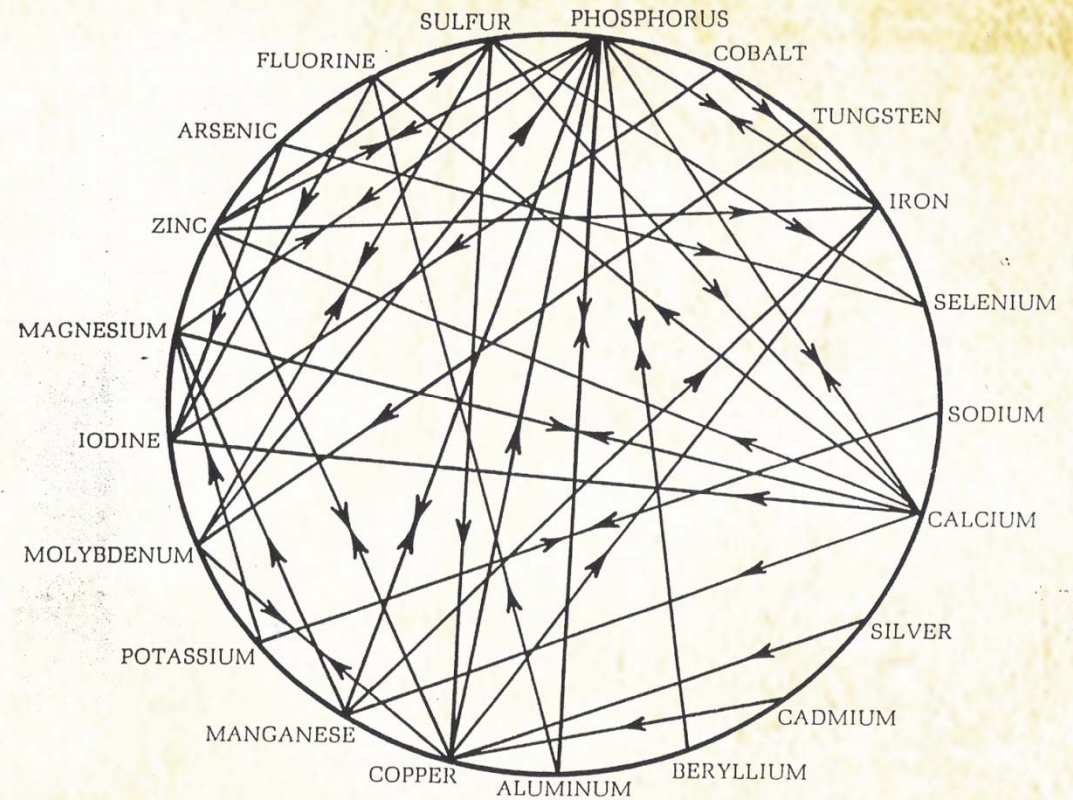
Average concentrations of elements in Fulton County, Illinois

| Element | Symbol | Mean | Std. dev. | Minimum | Maximum |
|-----------------|-----------------|--------------|--------------|--------------|--------------|
| Aluminum | Al (wt%) | 3.611 | 0.508 | 2.736 | 5.557 |
| Arsenic | As (ppm) | 7.719 | 2.439 | 3.424 | 12.371 |
| Calcium | Ca (wt%) | 1.275 | 0.294 | 0.727 | 2.357 |
| | | | | 5.269 | 18.917 |
| | | | | 1.522 | 4.081 |
| | | | | 0.010 | 0.010 |
| | | | | 0.385 | 1.094 |
| | | | | 25.881 | 245.090 |
| | | | | 0.585 | 1.807 |
| | | | | 0.031 | 0.121 |
| Lead | Pb (ppm) | 19.381 | 6.379 | 8.284 | 44.636 |
| Selenium | Se (ppm) | 0.476 | 0.272 | 0.107 | 1.390 |
| Titanium | Ti (wt%) | 0.288 | 0.035 | 0.185 | 0.426 |
| Zinc | Zn (ppm) | 127.384 | 100.929 | 28.853 | 536.057 |

Note that even in the same county there is a 13 fold difference in the amounts of selenium present.



Remember,
this is
only one
element.



Consider how the interactive complexity
increases with the addition of each other
element.

A Feeding strategy
to utilize the value
of your own feeds.

Feeding a variety of feedstuffs minimizes toxins and maximizes feed intake. 100's before domestication vs 4 or 5 today.

“Average” is a myth.
A TMR negates the ability of the animal to select for individual needs.

“Feed the rumen bacteria and the rumen bacteria will feed the cow.”

Step 1 Feed an effective
prebiotic/probiotic/enzyme product.

allows the maximum **D**igestion,
Utililzation and **A**bsorption of your
grain and forage.

Step 2

Offset the effects of
soil depletion and
confinement
by providing a
free choice source of
individual minerals.

Feeders

Plans are available





Self-Select Mineral Feeding Strategies

Animals don't need access every day.

Cattle will follow and stay close to the feeder.

A Basic Self-Fed Mineral Program

1. A mineral mix that is high in calcium with little or no Phosphorus. You could use ground limestone (Calcium Carbonate) or oyster shell flour or combinations.
2. A mineral mix that is high in Phosphorus with little or no Calcium.
3. Loose salt (not block salt), the more unrefined the better.
4. Kelp. This is a rich source of all trace minerals and iodine.

More Complex

Supplemental Magnesium and Potassium may not be necessary in all areas, but it does not hurt to make a feed-grade source available. Magnesium Oxide and magnesium sulfate are common sources -- can be mixed with salt to improve palatability so long as a separate source of plain salt is also available. An alternative is to provide dolomite limestone that contains Mg carbonate and Ca carbonate.

In many areas, potassium is already adequate or excessive. Potassium chloride or potassium bicarbonate is commonly used in commercial mixes to supply this mineral.

Sulfur is often deficient. Elemental sulfur can be provided free choice or mixed with salt.

Copper and zinc are often lacking and can be provided by mixing either copper sulfate or zinc sulfate with salt.

Baking Soda or Sodium bicarbonate free choice may be beneficial, especially if a lot of grain is being fed.

If not already present in some of the other mixes, provide a source of vitamins A, D & E and some B vitamins.

Commercial

Advanced Biological Concepts

301 Main St. P.O. Box 27

Osco. Illinois 61274

800 373 5971

www.abcplus.biz

Free Choice Enterprises

10055 County K

Lancaster, Wi 53813

608 723 7977

FCE@CHORUS.NET

Don't Forget Water!

Water stands alone as the most important nutrient.

For every 1 lb. of dry matter,
3 lbs. of water should be consumed.

Milk is 87% Water

Some Things to Notice

- ❖ Calcium consumption may go down in summer and up in winter.
- ❖ Magnesium consumption increases when on spring Grass.
- ❖ Copper consumption goes up in young stock or with moldy feed. Copper deficiency causes a red tinge to the otherwise black hair on affected animals.
- ❖ Zinc is associated with feet/hoof health.

- ❖ Sulfur is involved in hair and hoof growth.
- ❖ Animals will often drastically alter their mineral consumption within one day of ration changes and will often take more minerals in advance of imminent weather changes.
- ❖ Potassium may be a cellular detoxifier, if consumption goes up you may want to change rations.

Apparent Excess Consumption

- ◆ Excess minerals in TMR. For example, if there is excess Ca in the ration animals will eat excess P to balance the Ca/P ratio. Consumption of P will go down if some Ca is removed from the force-fed ration.
- ◆ ADE consumption goes up if there are high nitrates, excess protein or basic deficiencies in the feeds or ration, e.g. consumption goes up as hay and forages age and deplete in vitamin content.

- ◆ BVC intake increases with stress.
- ◆ Iodine consumption increases if nitrates are high or if there is stray voltage or geo-magnetic fields.
- ◆ Animals will eat to compensate for previous deficiencies E.g. replace bone mineral loss or liver reserves. Months up & down

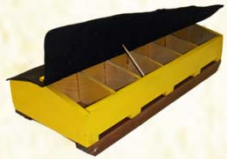
All Minerals Are Not The Same

- ✓ Cheap sources of some minerals are not as readily available to the recipient animal.
- ✓ Some minerals contain consumption limiters to limit consumption of the more expensive items.
- ✓ Some minerals contain flavor enhancers to force consumption of some items so that they conform with University Standards for mineral consumption.
- ✓ Some cheap sources of minerals imported from foreign countries are more likely to be contaminated with toxic heavy metals.

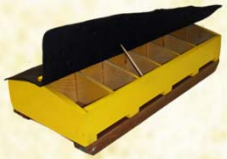
Benefits of Cafeteria-Style Minerals



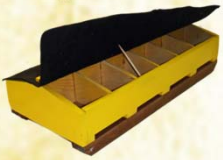
Provides a safety-net or early warning system if nutrition changes.



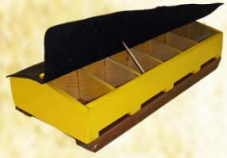
Feed costs go down as animals utilize feedstuffs more efficiently.



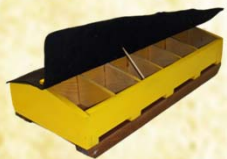
Animals stay in herd longer.



Reproductive efficiency improves.



Health care & Veterinary costs go down.

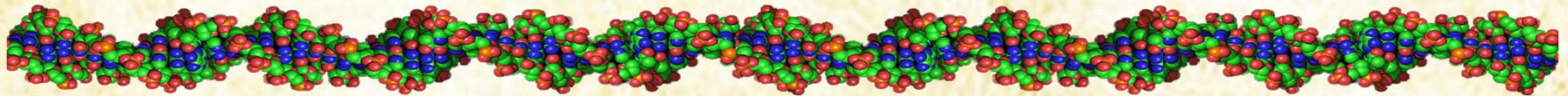


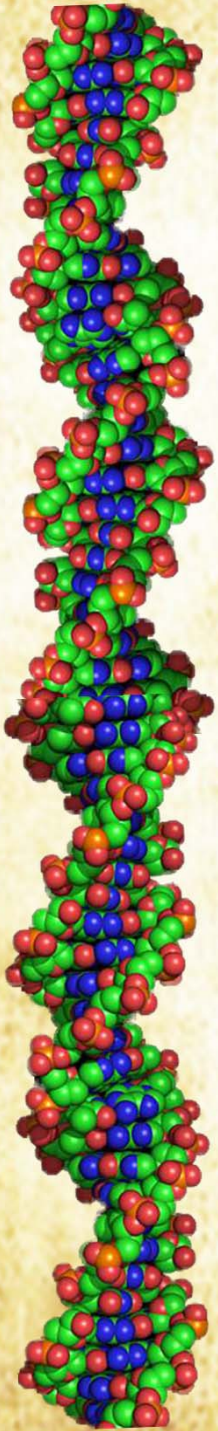
Allows animals to adjust minerals for seasonal changes & reproductive cycle changes



"If you want to reduce human or veterinary medicine to a common denominator, you have to remember that when the animal's physiology is deranged, it doesn't make much difference what you call the problem—but it is very probably a mistake in nutrition often founded on the attempt to be economical."

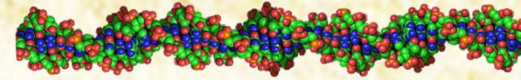
Epigenetics



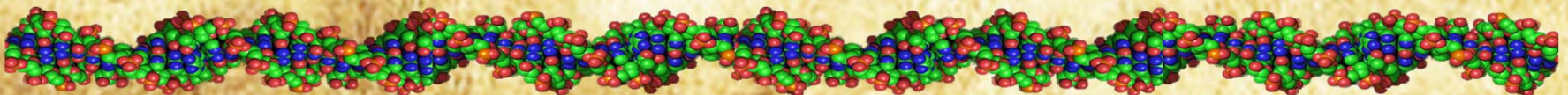


Identical Genetics but
Parents had different
nutrition & environment before
and during pregnancy

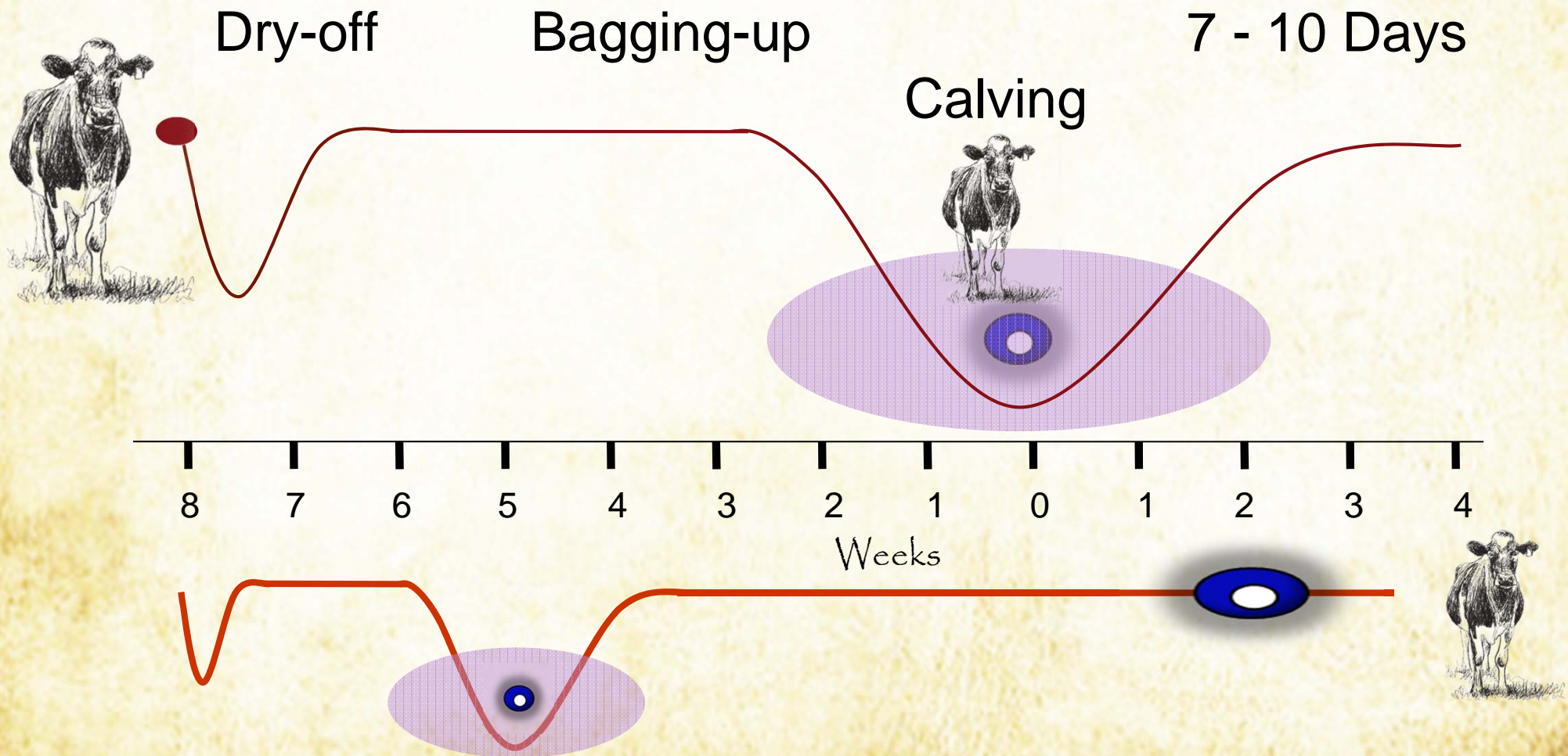
Epigenetics



- Epigenetics is the study of changes produced in genetic expression without changes in the underlying genes or DNA sequence.
- If you think of a computer as a collection of genes (hardware), then epigenetics would be the computer program (software) that runs the computer.
- Stress, diet, behavior, toxins and other factors activate chemical switches that regulate gene expression.
- These changes can be inherited by future generations.



The Critical Dry-Cow Period



A window of opportunity
that may affect the next several generations.

Generational Timeline

...tracing the health of
embryos through many
generations.

Grand-
mother

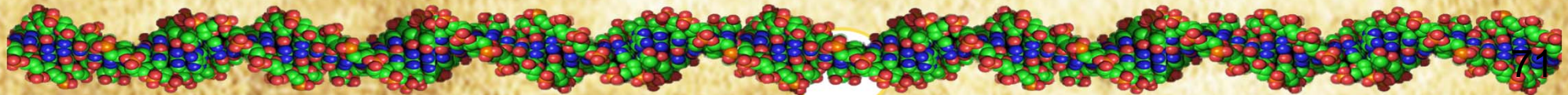
Mother

"Bossy"

Daughter

Grand-
Daughter

Epigenetics



A Different Perspective

Some Effects of Mineral Feeding on Soil Fertility


Natural Mineral Cycle




Soil & Grass
stays
reasonably
balanced.

Manure deposited back on the soil after having been acted upon by rumen bacteria, enzymes, pre & probiotic., Animals die and bodies are recycled.

Soil & Grass
reasonably
balanced



A variety of plants and natural occurring licks allow grazers to fine-tune their mineral balance.



Deer, bison, elk and other wildlife lick minerals and carry it to other areas improving the soil balance.



Force Fed Minerals Cycle

Soil & Grass
unbalanced

Soil & Grass
Becomes more
unbalanced

Manure contains
the excess
residue of un-
utilized force fed
minerals

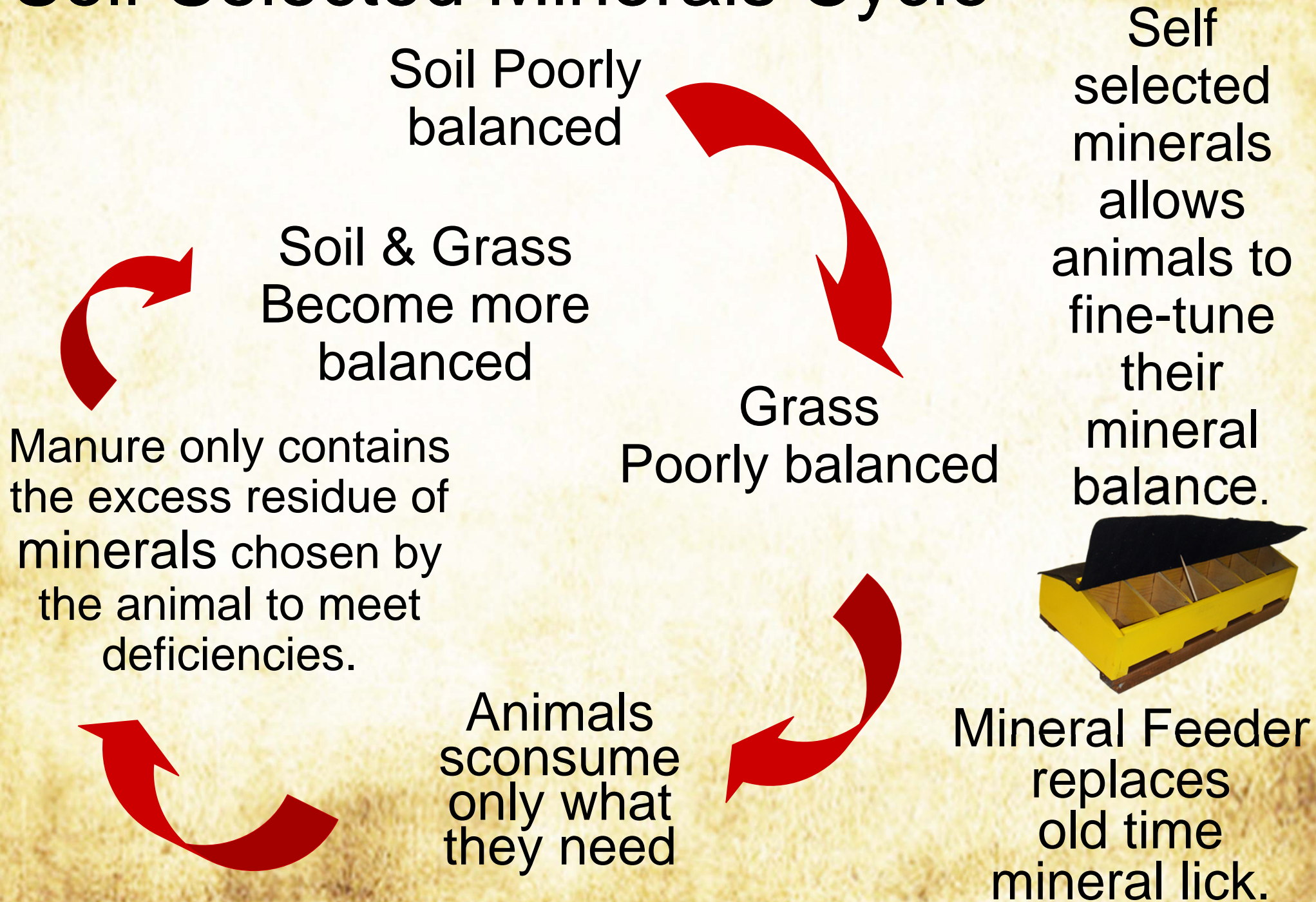
Animals forced to
eat an unbalanced
mineral

Grass and
minerals
not in
balance

If you force
feed an
inappropriate
mineral mix,
animals may
attempt to
balance their
mineral needs
by eating dirt,
chewing wood,
or eating dead
rabbits.



Self Selected Minerals Cycle



Manage the Cause

Check-List

- ◆ Fertile, highly mineralized, biologically active, high organic matter soils. Soils and crops free from herbicides, insecticides, antibiotics and GMO contamination. Beyond Organic!
- ◆ Nutritious, high forage diet. Use only feeds that are inherently “natural” to the species ... feeds that are appropriate to the species, age and intended production. Avoid urea, animal fats, cottonseed and excess protein.

Manage the Cause

Check-List

- ◆ An environment or lifestyle as close as possible to one inherently natural to the species.
- ◆ Free choice individual minerals, trace minerals, salt and kelp.
- ◆ Immune support at critical stress periods. Focus on the pregnant female & the newborn.
- ◆ Regular, frequent checks of water quality, stray voltage, production equipment and handling procedures. Avoid stress.

Manage the Cause

Check-List

- ◆ Genetics - avoid inbreeding and cull vigorously.
- ◆ Ponder on the wisdom of Bromfield, Albrecht, Howard and our other pioneers!
- ◆ Be skeptical of bought-and-paid-for research. Who paid for the research?
- ◆ Believe in and have faith in what you are doing. Trust your own powers of observation. Thoughts are things!

If you don't feed a balanced mineral program,
your animals may have to eat dead rabbits
to satisfy their mineral needs!



The Penultimate Symptom
of Phosphorus Deficiency



Advanced Biological Concepts®

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Email: jgh@a-b-c-plus.com

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