

Doc's Blog

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“When you
change the
way you look
at things,
the things
you look at
change.”

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Mineralization of Baby Calves

January 1, 2018

I recently viewed a research paper entitled: "Mineralization in newborn calves contributes to health, improve the antioxidant system and reduces bacterial infections." The abstract is available at <http://www.sciencedirect.com/science/article/pii/S0882401017315164>

This study evaluated the benefits of an intramuscular mineral supplementation on the health of dairy calves. Ten calves were divided into two groups — a control group and a test group. On days 2 and 14 post-birth, the 5 animals in the test group were injected with 3 ml of a solution containing selenium, copper, potassium, magnesium and phosphorus. Blood was collected from all animals on days 2, 10, 20 and 30 of life in order to analyze the antioxidant enzymes that affect the immune system.

According to the researchers, mineral supplementation presented many beneficial effects including: an increase in the activity of antioxidant enzymes, improvement of immunity, lowered mortality, less incidence of diarrhea and anemia, and less need for the use of antibiotics.

I thought this was an interesting study, especially since it confirms what I have seen over the years in calves born to properly mineralized dams. The study would have been better if it had compared blood levels of calves from highly mineralized dams to those on a less than adequate diet. I hope no one uses this study to begin marketing trace mineral injection as a treatment for mineral deficiencies.

As Dr. Wm Albrecht pointed out decades ago, it takes healthy soil to grow the healthy plants necessary for healthy animals and humans. It would be accurate to replace the word "healthy" with the words "highly mineralized."

Unfortunately, confinement of animals and soil depletion necessitate some sort of



supplementation of minerals. Thus, feeding “ground up rocks” is a standard practice until soils and plants can become more mineralized. Some livestock owners feed a ‘one-bag-fits-all’ mineral mix. The smarter ones provide a variety of minerals so the animals can use their innate nutritional wisdom to balance their individual mineral needs.

Minerals & Spark Plugs—Team Players

January 10, 2018

I have often been accused of having a one-track mind

with regard to feeding minerals, since I usually recommend feeding cafeteria-style minerals as a vital element in the treatment of most herd health or nutrition problems.

There are several reasons for this:

Feeds are less mineralized today because of soil depletion and the adverse effects of commonly used herbicides.

Confinement of livestock in CAFO's restricts the exercise of an animal's innate nutritional wisdom to pick what it needs — if given the choice.

It is easy to dump excess minerals into a ration or a TMR, but extremely difficult to attain a suitable balance for each individual animal.

Cafeteria-style mineral feeding adjusts for all three of these situations.

Consider this: trace minerals are an intrinsic part of the enzymes that modulate most metabolic processes. Thus, trace minerals can be likened to spark plugs that modulate the function of gasoline motors. If some spark plugs are missing or out of time the engine will not operate efficiently or not run at all.

Trace minerals, like spark plugs, are team players — they all must be working together to be effective.



Walk the Farm

March 15, 2018

A presentation at a recent Dairy Conference was entitled, "Walk The Farm If You Want to Know the Truth." The speaker cited his experiences as manager of a large, up-scale, 14 floor hotel. Starting early each morning he would walk all of the halls, checking rooms, lounge areas, kitchen, restaurant, and even bookkeeping entries. He would then confer with the responsible staff and remedy any problems. He did this three times every day. He said as he did this problems diminished remarkably.

His point was, whether managing a hotel or a dairy, if you want to know what's really going on, you need to have an eyes-on presence in every key area — several times a day. The information he gets from personal observation is more valuable than verbal or written reports from subordinates.

For a dairyman, I think eye-balling the cows is a must. My friend and former colleague, Dr. Bob Scott, often said, "The most valuable time a dairyman spends on his farm is when he is leaning on a fence looking at his cows." I agree.

It's not only about being on-site and looking around — the very presence and subliminal mental input of the manager adds another element to the equation of success that makes

the whole operation more cohesive, more productive, and more profitable. As Dr. Marvin Cain, DVM, so succinctly put it, "Thoughts Are Things".



Marcus Porcius Cato
234-149 BC

In 160 BC an old Roman, Cato the Elder, wrote a treatise on agriculture titled 'De Re Agri Cola.' He wrote: "The master's eye doth fat the ox, his foot doth fat the ground". I interpret this to mean that in order to have healthy and productive soils, crops, and animals, the Master must be personally involved in caring for both. Walk the Farm!

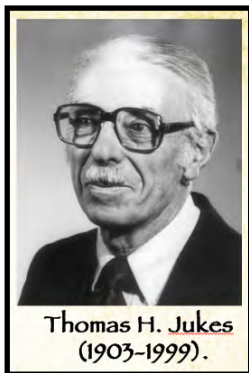
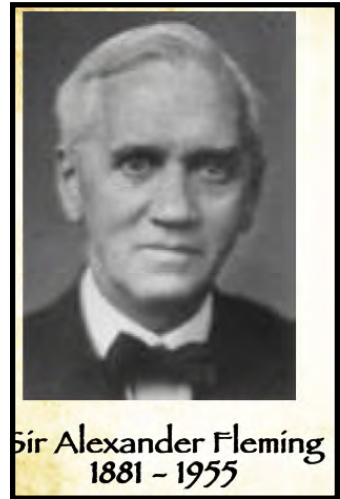
Antibiotics — Good or Bad?

March 21, 2018

I had a phone call from a fellow with a question about injecting his horse with antibiotics. His Vet had diagnosed a case of Strangles (*Streptococcus equi*) and recommended a course of antibiotic treatment. The owner wanted to know if that would upset his plans to be organic. I think he was concerned that using antibiotics would violate some basic precept of holistic thought. I assured him it would be a prudent thing to do.

I think antibiotics are a good and useful technology. Since Alexander Fleming's discovery of penicillin in 1927 it has saved many thousands, perhaps millions, of lives. Antibiotics, in and of themselves, are not bad. The problem we have with them is misuse. Fleming warned, early on, that if penicillin was used at too low a dose or for too short of a time it would lead to antibiotic resistant bacteria. We ignored his advice.

In 1947, a hospital in London experienced 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.

In 1948 Thomas Jukes, a poultry nutritionist at Lederle Laboratories, fed a few ounces of the left over growth medium from the production of the newly discovered broad-spectrum antibiotic tetracycline or aureomycin to a group of chicks. The results in increased growth rates were amazing as were the short-term health benefits.

Jukes shared his results with some colleagues and the practice of feeding low levels of antibiotics to livestock spread like wildfire. This enabled the start of the CAFO industry and was the beginning of the lethal game of leapfrog that organisms and antibiotics have engaged in ever since.

The Population Bomb

March 29, 2018

I had to chuckle when I recently read about Paul Ehrlich's new book - "The Population Bomb Revisited" - in which he predicts pretty much the same doomsday message he espoused in his original 1969 book, "The Population Bomb." Both books foresee a shattering collapse of civilization to be a near certainty in the next few decades.



For me, his reputation is somewhat tarnished by the fact that most of what he predicted 50 years ago has not come to pass — but some of it has. Back then he predicted mass starvation caused by rampant population growth. That hasn't happened — yet — but is happening. There has been a tremendous population increase in the last 50 years and there are parts of the world suffering from

famine - mostly caused by faulty global distribution systems and not so much by failure to produce enough food.

His new book adds the problems of our continuing destruction of natural resources and the contamination of the planet's farm land by products of Big-Pharma. Ehrlich wrote that the poisoning of our food may be more damaging than climate change. He also pointed out that chemical contamination has caused sperm counts to plummet world wide — which may contribute to population decline in the long run.

I started out to write this as a criticism of Ehrlich's lack of accuracy in his predictions — but I was wrong. Stick to your guns, Paul, the only mistake you made was in estimating the length of the time-line.

Minerals for Multiple Species

April 6, 2018



A fellow who grazes several species together, — cattle, horses, sheep, goats, llama, and swine — recently asked me if a cafeteria-style mineral feeding program was feasible for that many different species. I told him,



as far as the minerals themselves were concerned, there was no problem. All those species do well on a full array, self-select mineral program.

That being said, I told him I wasn't sure how the delivery system would work. Some things to consider.

Species compatibility. Animals tend to congregate at mineral feeders.



More aggressive species (or individual animals) may interfere with other animals having full access to the minerals.



A basic feeder may not be easily accessible to all species, thus requiring other feeders of different design.



Hogs tend to be messy eaters. Other species may not wish to eat at the same table.

I would appreciate feed back from anyone who tries this or anyone who already does this.



Animal Intelligence

April 16, 2018

There currently seems to be a lot of interest in animal intelligence or consciousness. Recently, a friend asked me which animal I thought was the smartest. My first thought was primates and then possibly elephants — but, since my only experience was with domestic animals, I opined that the pig was the smartest.

I am not an expert on animal behavior nor do I know how to scientifically rate their intelligence. I'm sure there are many ways to do this. I suppose one could compare their activities and reactions to humans. But, if we did that it would only be fair to examine and rate our ability to function in a pig's world!

Then too, we could rate animal intelligence on how well they integrated with their environment and society — finding food, reproduction, social structure etc, but that would be highly subjective.

Their ability to communicate within their species, as well as with other species(including humans) would be an important factor.

Having said all that, I don't know why I chose pigs. Pigs have an undeserved reputation as being a dirty animal (mostly when raised in close confinement). Pigs do not sweat and a cool mud-bath on a warm day protects them from dehydration and sunburn. Pigs are cute, alert and exhibit many different personalities. I believe that a face-to-face, look-me-in-the-eye involvement with any animal will provide insights into an animal's basic persona. Try it sometime.

Going back to my choice of the pig as the most intelligent domestic animal, consider this: Given the choice, most animals will select feedstuffs and minerals conducive to good health — but, given a choice, many humans will choose to eat junk food or Franken-food.



Given the opportunity, a pig will usually not soil its sleeping or eating areas with feces — but,

given the opportunity, humans poison their fields and food with toxic chemicals — all for the profit of Big-Pharma. It begs the question; "Are humans as smart as pigs?"



Iodine deficiency in Goats

April 25, 2018

A goat owner said to me: "This kidding season, the newborn buck kids were unusually large while the doe kids were unusually small. I have heard that this could be caused by a deficiency of iodine. Have you ever heard of anything like that?" I had not.

But, I did some internet browsing and checked a couple of books on goat medicine, and could find nothing on sex related birth size disparity in newborn kids.

After reporting this to the goat keeper, she sent me a reprint entitled, "RECORDS OF NUTRITIONAL FACTORS IN FERTILITY OF GOATS" — posted to my blog site as <http://www.dochollidaysblog.com/article-index/records-of-nutritional.html>.

This paper summarized over a decade of fertility records in an Australian goat herd from the late 1960s and 1970s. The herd experienced the same size disparity in newborn buck and doe kids as stated in the original question.

The problems were apparently associated with feeding clover or alfalfa hay along with a mineral supplement containing a generous limestone base. It was thought the phyto-estrogens in the legume hay (containing goitrogens which depress the production of the hormone thyroxin) along with the high calcium content of the hay and mineral limited the uptake of iodine by the thyroid gland.

The elimination of clover hay and ground limestone from the diet resulted in a remarkable improvement in fertility but the sex ratios still favored males 1.4 to 1. This ratio was improved when iodized salt and copper-cobalt licks were offered.

Classic signs of Iodine deficiency in newborn goats are being born dead, abnormal hair coat, and enlarged thyroid glands, located in the throat area — goiter. Since this lady's goats showed none of these signs, I doubt if an iodine deficiency was involved.

Some folks recommend giving oral doses of Lugol's iodine as a supplement. I think this is a bad idea. It is difficult to know the exact amount needed by individual animals. Force feeding could lead to an excess of iodine, which can also cause thyroid gland problems.



If you suspect your animals are low on iodine and need a supplement, you could provide a free - choice source of iodized salt AND a free-choice source of regular white salt. This allows animals to match their individual needs without over-loading them.

In the last analysis, the best plan is to provide a full-course, cafeteria-style mineral feeding program.

Cattle Massacre in New Zealand

May 30, 2018

I see where New Zealand is planning to kill 150,000 cows in an attempt to eradicate *Mycoplasma bovis*. This bacteria can cause cows to develop mastitis, pneumonia, arthritis — all of which result in production losses. Of the 39 herds known to be infected, they plan to slaughter some of the cows for human consumption, exterminate the rest and bury them on the farm. The estimated cost is over 600 million USD.

I think this is a bad idea for several reasons. If there is a possibility of other domestic or feral animals also harboring the disease, there is always the possibility of reinfection from these sources. In the US, Brucellosis and Tuberculosis have been eradicated in most domestic herds but are still endemic in feral bison, elk and deer.

I also wonder if it is a good idea to arbitrarily kill the exposed, unaffected animals in the infected herds. It seems to me, the fact some animals in the herd are not affected indicates a degree of natural immunity to the disease that would be beneficial to preserve.

In the last analysis, it often is not a bacteria that causes a problem but an impaired immune system. If New Zealand cows are not managed any better than US cows they, too, are probably under a lot of stress, force fed too much protein and suffer from grossly unbalanced minerals in their diet. An animal with an impaired immune system is more susceptible to any germ that comes along — if you eradicate one germ another will often take its place.

In 1961 the USDA mandated a Hog Cholera eradication program which successfully resulted in the US being declared free of Hog Cholera in 1978. This was hailed as a great success. Unfortunately, it wasn't long before other,

heretofore almost unknown, virus diseases of swine such as pseudo-rabies began to cost the swine industry almost as many dollars as had Hog Cholera before eradication. This is a good example of the way nature uses germs as 'censors of nature' to eliminate substandard individuals.



Imprint Training of Foals

June 29, 2015

In a conversation with an equestrienne friend, I asked if she had ever read any books written by Robert M. Miller, DVM — she had not. She also was not familiar with the concept of imprint training of foals. I guess she was mostly focused on her horse's performance rather than early training of foals.

Dr. Miller wears many hats — veterinarian, equine behaviorist, author, and cartoonist. My first exposure to his work was his whimsical cartoons on veterinary life published in Vet magazines. (one of which is displayed below).

He is best known for his



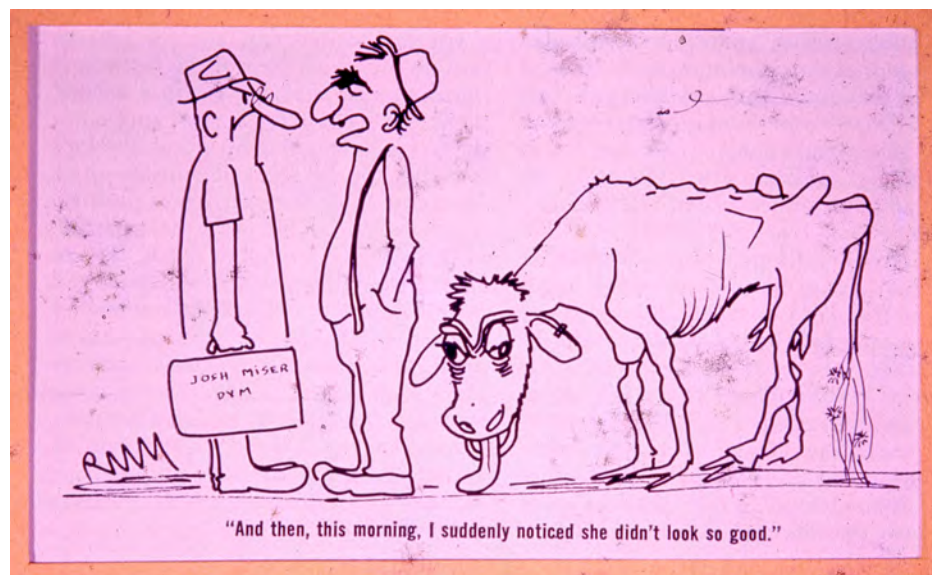
pioneer work in the concept of imprinting foals. Early in his practice, Dr. Miller observed how dangerous it was — to vets and horses alike — when adult unbroken horses were first handled for treatment. He developed a protocol of handling foals at birth to imprint an acceptance of human contact in the newborn foals. The lessons learned in the first few days of life persists to adult and makes the grown horses comfortable around humans and safer to train and treat if necessary.

The process is quite simple. The newborn is touched everywhere from ears to including feet and legs. The foal may be haltered and taught to lead. Feet may be picked up and examined, mimicking future activities. The goal is to get the youngsters used to all the handling they will experience as adults. Horses have exceptional memories and will remember early lessons for life.

Imprinting occurs in most species. Ducklings hatched by a chicken will imprint on the hen as their Mom and follow her around. — a strange sight to see a line of ducklings following a chicken.

I don't know of anyone deliberately imprinting dairy calves but raising calves in individual hutches is a close second as it allows the animals to bond with their human caretakers. It does, however, lack the actual physical touching associated with imprinting.

Dr. Miller has written several books on this subject and there is a lot of information available on the internet.



Trouble Shooting Mineral Deficiencies

July 6, 2018

I occasionally get phone calls something like this, "Hey, Doc. My horses have 'XYZ', what mineral should I be feeding for that?" Further conversation usually reveals they are being fed a bunch of different supplements — some force fed in the ration and some fed free-choice.

It is not usually possible to prescribe appropriate minerals just on the basis of symptoms, but there are situations when symptoms or signs do point to a certain mineral deficiency. For example, if the normally black hair coat of a cow is tinged with red it almost always signifies a copper deficiency. Hoof and hair problems may be associated with deficiencies of zinc and copper. Then too, certain environmental conditions influence consumption of certain minerals — some animals take more sulfur in the spring and fall when building new hair. Cattle on lush spring growth pasture usually need more magnesium.

When encountering questions similar to the one above—and knowing that an accurate diagnosis is based on good information—I immediately start asking questions.

1. What are you currently feeding? I am often amazed at the number of supplements some folks give their animals. I sometimes suspect a bunch of different supplements can cause problems with mineral interference. What I am looking for here, is any obvious incompatibilities or gross over feeding, Resulting in metabolic deficiencies even with adequate minerals.



2. Have you tested the water for livestock suitability and especially for nitrates?
3. Do you provide separate sources of calcium and phosphorus?

4. Do you have a separate source of plain white salt available?
5. I usually ask the owner or caretaker, "What do you think is the problem?" Since I am sitting at a desk hundreds of miles away and they are right next to the animals, I believe their observation and impressions should be factored into the decision mix.

Answers to the above questions will usually identify some things to be changed or improved. Many times, that involves the removal of some of the duplicated supplements and I always recommend providing a full-array, free choice mineral feeding program.

Bumble Bees Can't Fly

July 17, 2018

When I was a youngster there was some research making the rounds that said; "Bumble-bees can't fly." I guess some budding aerodynamic scientists had tried to compute the weight/lift ratios for these big bees and come to the conclusion that, mathematically, "bumble-bees can't fly."

While the report was probably issued 'tongue-in-cheek' it was good for some chuckles as it was obvious bumble-bees were still flying. The phrase has stuck with me over the years and even today, when I see some research that defies common sense, I say to myself; "Yeah, right! and Bumble-bees can't fly either."

Our society seems really enamored with science. If we read "Laboratory tests show..." or "University research proves ..." or "Scientists claim..." — most people believe it. I don't!

For any research to have credibility with me, I have to know, at a minimum, the credentials of the researcher and, most importantly, who paid the bill. It is also interesting to know where the person worked before and after the research was published. A lot of research today reflects the bias of the

author and some is down-right fraudulent. Proof of impartiality is hard to find.

Consider the ongoing controversy over the safety of Glyphosate. There is a multitude of peer reviewed studies on both sides of the issue. Which is right? How does one decide? Finding out who funded the studies would give us some clues.

At some point we need to invoke common sense or, better yet, the *Precautionary Principle* which implies that there is a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk.

In conclusion, when you encounter outlandish statements from Big-Ag or Big-Pharma, join me in saying; "Yeah, right! and Bumble-bees can't fly either."



An Environmental Disaster

August 22, 2018

A recent report from Wisconsin indicates 54 Wisconsin dairy farms sold out in June (2018), bringing the yearly total to 338. Although the report did not specify, it seems safe to believe it is small, family-farm type dairies being dispersed.

It's sad to see the demise of the small dairy farms. Back in the day, small dairies of 40 to 60 cows were the backbone of the industry. One family could grow and harvest crops, tend the cattle, and do the milking. They were an almost perfect example of a cycle of nature, wherein crops were fed to animals and the manure recycled to the land to grow more crops. Those small farms had little environmental impact.

After World War II everything changed. That's when war-time munition plants began switching to agricultural products — NPK fertilizers, and other highly toxic fertilizers, herbicides, and pesticides. Feeding antibiotics allowed the assembly of large Concentrated Animal Feeding Operations (CAFO's) to gain "efficiency of scale". To keep up with the post-war boom economy, dairy farmers were advised to, "Get big, or get out" — starting a trend that has resulted in the rise of huge mega-dairy operations containing thousands of cows.

As an example of the ill effects of mega dairies, consider the plight of Lost Valley Farm, the second largest dairy in Oregon.



Started in the spring of 2017, it is owned by Greg te Velde, and funded by Rabobank, a Dutch agriculture lender.

From the start, te Velde failed to conform to regulations and was cited for improper waste management practices resulting in contamination of adjacent groundwater and nearby wells. His waste management permit was revoked and he was given 60 days to remove 13,000 cows and 75-acre feet (approximately 24.4 million gallons), of manure and wastewater from his lagoons. Earlier, te Velde agreed to disperse his cattle, but one day before the sale he filed for bankruptcy effectively putting everything on hold. The dairy is now for sale priced at \$95 million.



Te Velde owns two other failing dairies in California, and is facing foreclosure from Rabobank. Te Velde is currently receiving treatment at a drug and alcohol rehab clinic. It was not specified if he entered the clinic before or after this disaster.

Bottom line: Any assembly of a mega-number of animals in one area is an environmental disaster waiting to happen. The profitability of mega-livestock operations depends on raping the environment. When forced to pay the damages, bankruptcy results.

For more information, check out these links:

<https://www.dairyherd.com/article/oregon-mega-dairy-loses-waste-management-permit?>

<https://www.dairyherd.com/article/wisconsin-loses-another-54-dairy-farms-june?>

Eat Lab-grown Meat or Starve

September 8, 2018

I read a recent report from the Adam Smith Institute, a think tank in the UK, that opined if we did not switch to lab-grown meat the world would face a massive food crisis. It seemed to me, many of the claims were questionable — perhaps even frivolous.

Here are some of the claims along with my comments:

- Lab-grown meat (LGM) would need less land for farming. If lab-grown meat became the norm, 99 per cent less land could be used thus releasing millions of acres of pasture land for other uses. The source of this figure is not given.
- LGM would give the world access to a low cost, high protein diet, the cost of a lab-grown burger pegged at about \$10.50. Undoubtedly, it will continue to get cheaper but is still out of reach for people in many countries.
- LGM could help solve the housing crisis by freeing up land currently used by farmers! I don't know where this came from. I can't imagine how removing some grazing cattle from marginal pastures could free up land someplace for a person to build a house!
- Beef takes a hectare (2.47 acres) to feed one person whereas nineteen people are fed per hectare of rice produced. They did not specify the origin of these figures, nor did they indicate how many people could be fed on a hectare of LGM's.
- As much as 96 percent of agricultural green-house gas emissions could be cut by switching to LGM — taking a further step towards tackling climate change. It sounds good but in reality most of the gas emissions are associated with mega-farms - CAFO's - and not from pastured, grass-fed beef.
- The looming antibiotic resistance crisis could be prevented by cultured meats which do not use antibiotics. Antibiotic resistance started way before livestock were routinely fed antibiotics. Fleming discovered penicillin in 1928—he predicted bacteria would develop resistance if the antibiotic was not used at high enough levels or for too short a time. There was an outbreak of penicillin resistant staph in London in 1947. It spread to Australia in 1953. In 1955 it crossed to

the U.S., affecting over 5000 mothers and children in a birthing hospital in Seattle. The new broad-spectrum antibiotic - aureomycin — was first fed to a tiny group of chickens in



1948, which practice gradually escalated into today's wide-spread feeding of antibiotics to livestock. Curtailing antibiotic use in animals may alleviate, but will not eliminate, the problem of antibiotic resistance.

All these claims predict great environmental damage from the rearing and slaughter of animals, but do not address the environmental impact from lab-grown meat — surely there is some. I wonder what is the down-side of LGM's?

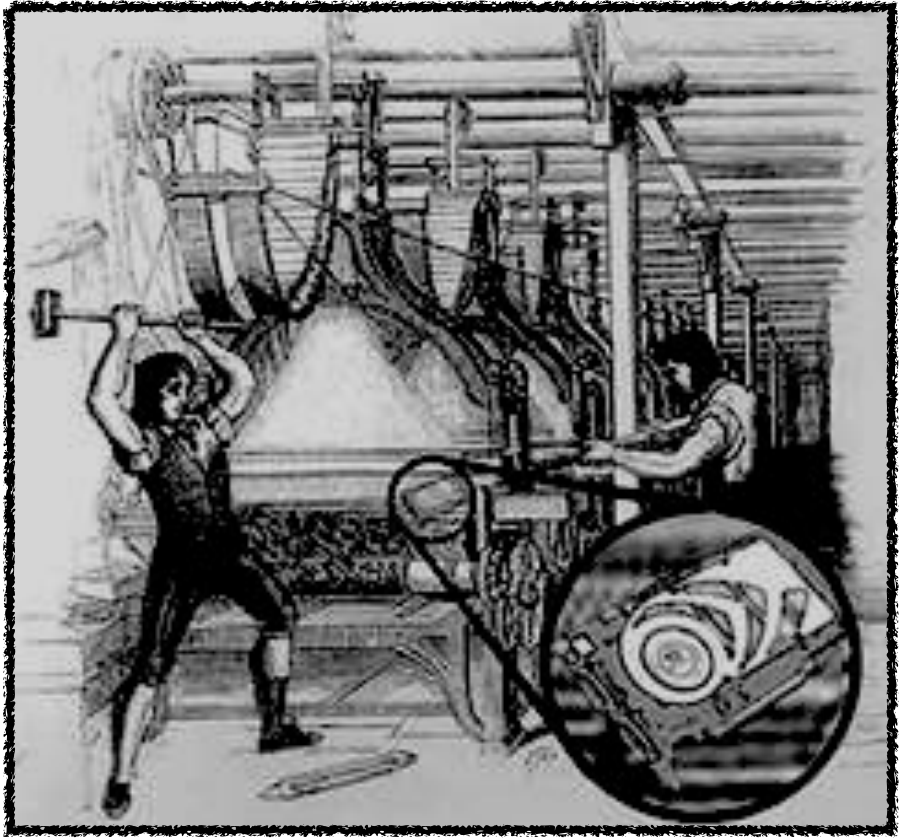
Learn more: <https://www.thesun.co.uk/news/7135261/meat-should-be-grown-in-labs-by-scientists-or-the-world-faces-a-massive-food-crisis-report-says>

Am I a Luddite?

November 1, 2018

I was recently accused of being a Luddite. I looked it up and found that the original Luddites were a group of radical English textile workers. During the early 1800s they protested by destroying new weaving machinery that was replacing them as weavers. After five years, the region-wide rebellion was quelled by military force in 1816. Today the term Luddite has come to mean anyone opposed to industrialisation, automation, computerisation, or new technologies in general.

I guess I have to admit it, I am a Luddite in some ways at



least — but not in all areas.

For example, I am not a Luddite in the areas of electronics and communications. To be able to have a real-time video conference with friends and family almost anyplace in the world is a boon to mankind that overshadows many of the negatives. The ability to have the knowledge of the world at our fingertips via the internet is akin to a miracle.

I am not a Luddite when it comes to the advances in travel—automobile engines operate cleaner—tires are safer and last longer. While it took the pioneers months to travel in wagon-trains from St. Joseph, Missouri to Oregon in the mid 1800s, we can now make the journey in an automobile in a few days or mere hours in a jetliner.

I am definitely a Luddite when encountering many of the facets of today's so-called conventional agricultural technology. I am encouraged by the revival of holistic farming but alarmed by the pervasiveness of GMO

technology and the associated herbicides. I believe the keyword here is 'irreversibility'. It is a slippery slope like a ski-slope with a swamp full of alligators at the bottom. Once you are on it there's no turning back.

Today, it is almost impossible to buy food that is not contaminated with GMO's, glyphosate, and myriads of other toxic agricultural chemicals. These substances do not just go away. Even if we stopped using them today, it would be decades, and probably generations, before they are completely cleansed from our soils and crops.

Consider this quote from Dr. Don M. Huber, Professor Emeritus, Purdue University. "Future historians may well look back and write about our time, not about how many pounds of pesticide we did or did not apply; but about how willing we are to sacrifice our children and jeopardize future generations with this massive experiment we call genetic engineering that is based on false promises and flawed science, just to benefit the 'bottom line' of a commercial enterprise."

Drying-Off Dairy Cows

8 November 2018

I recently read an article entitled *"5 common mistakes farmers make when drying off cows. The author discussed many items of concern to insure a healthy dry-off."* It is a good, informative discussion that is well worth the time to read. It can be viewed at www.independent.ie/business/farming/dairy/dairy-advice/5-common-mistakes-farmers-make-when-drying-off-cows-37495977.html.

While drying-off dairy cattle can be a daunting task, it is also an opportunity to prepare the cow for the next lactation. If done right it can affect the health and productivity of the cow as well as her calf and future generations. Done wrong it can have devastating results.

Here is my prescription for drying-off a dairy cow. I know some of the steps may not be acceptable to some dairy professionals but it does conform to the innate physiology of the cow. Give it a try, I think you will be pleased at the results.

At Dry-Off

1. Milk out a 4 quarters, then quit milking (After cessation of milking, it takes 5 or 6 days for the hormonal system of a cow to get the message



to actually quit producing milk. During that time, if the cow is milked to relieve the tight udder, the clock starts again — and it takes another 5 or 6 days. The only valid reason to milk a cow during this critical period is if she shows signs of an udder infection.)

2. Administer a natural immune stimulant. After 5 - 6 days, when the swelling in the udder begins to recede, check the milk and milk out completely.
3. If milk is normal, dip the teats. The transition from a lactating cow to a dry cow was successful.
4. If milk is of questionable appearance, repeat steps 1 to 3 above until the milk appears normal.
5. Moderately restricting feed and water at this time will hasten the dry-off process.

Two Weeks Before Freshening

1. Administer a natural immune stimulant.
2. Pre-Partum Milking. Check the milk in each quarter. If pre-fresh secretion is of questionable appearance, start milking all 4 quarters, twice a day. At first, the secretion will look like honey gradually changing to look like skim milk and then regular milk.
3. The colostrum is produced when the cow starts to calve. Save the milk right before and right after calving and give it to the calf.

Fresh Cows

1. If indicated, for extra support, administer a natural immune stimulant.
2. Avoid letting the fresh cow eat the placenta.
3. Seven days after calving, infuse the uterus with a natural uterine flush.
4. Check for elevated temperature daily for 10 to 14 days to get a head start on any problems that may be developing.
5. Check for sub-clinical milk fever.

Research — Reading Between the Lines. November 24, 2018

We rely on university research in many of our management decisions. Unfortunately, often the conclusions or summary statement in a research report does not match the actual data or results. Here is an example of erroneous conclusion drawn by some researchers.

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

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."

Let's take a closer look of some of the excerpts from that study along with some comments (comments in red).

"Trial 1 was 16 weeks in which two groups of cows in mid-lactation (10 cows / group) were group-fed rations with either corn silage or alfalfa hay as the sole forage, and all supplemental minerals and vitamins were provided free choice." **This is too small a group and too short a time to evaluate the nutritional wisdom of animals. A full 12 months would be better as that**

would encompass the gamut of lactation, dry period, parturition, and back to lactation. Even better would be a multi-year experiment that examines the health and productivity of the calves born to the two research groups, thus evaluating the multi-generational effect.

"Minerals and vitamins were provided in a "cafeteria style" mineral feeder, one feeder per group. The feeder was sheltered and afforded protection from wind and rain. Mineral and vitamin mixes were: calcium, phosphorus, potassium, magnesium, and sulfur trace mineral, bicarbonate of soda, sodium bentonite, sodium chloride, iodine mix and vitamins A, D, and E. Intake of each individual mineral was determined weekly for each group."

"Intake of phosphorus, potassium, and vitamins differed between rations. A higher free choice intake of phosphorus by cows fed alfalfa was not expected." *It should have been expected as it is well known that cattle need to balance their Ca/P ratio.* "Cows could possibly have been consuming more P to narrow the wide Ca:P ratio due to high Ca intake from alfalfa." *Of course they ate more P to balance the high Ca in alfalfa. That's what free choice is all about — giving them the opportunity to self regulate their needs.*

"Cows fed corn silage consumed more potassium free-choice, but additional intake still was needed to meet requirements." *Whose requirement are they trying to meet, NRC standards or what the cow actually needs? 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. Where corn silage and alfalfa, forages that differ in mineral content, were fed as the sole forages to two groups of cows, 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." *Actually the main mineral ratios were balanced by the cow's mineral preferences. They balanced the critical Ca/P ratio by eating more P to compensate for the high Ca in alfalfa. The cows in*

the alfalfa group took almost no K while the corn silage group consumed 36 times more K than the alfalfa group.

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

It pays to "read between the lines" when evaluating research reports. It is also helpful to know who paid for the research, who did the research and where did the researcher worked before and after he did the research. A good dose of common sense is also indicated.

Why Isn't There more Research on Self Select Minerals for Livestock?

November 28, 2018

Our current scientific culture is almost totally enamored with reductionist research. Typical investigators try to divide everything into smaller and smaller portions and then research the tiny remaining part. As one pundit put it, "They seek to find out more and more about less and less until they finally know everything about nothing."

Another side of reductionist thinking is it allows short term, small sample evaluation of new drugs or agricultural chemicals. This enables Big Pharma to quickly get government approval for toxic products before the appearance of the almost inevitable side-effects. Monsanto's original safety test to gain approval for Glyphosate — two small groups of rats compared for three months — is the epitome of reductionist research.

I believe it is impossible to research the effect of holistic practices using reductionist thinking. The very term "holistic" indicates the concept must be taken as a whole.

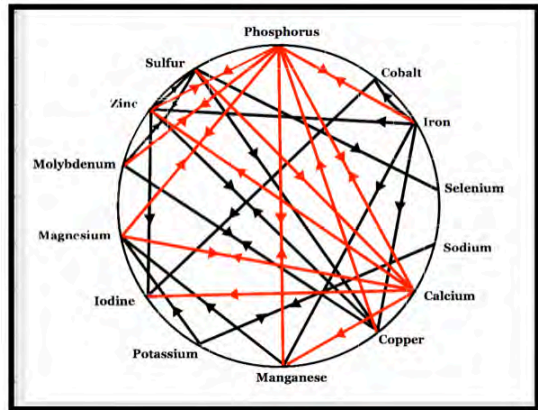
The mineral wheel is a simple way to illustrate the complicated interrelationships of any holistic model. Each mineral has a relationship with most of the others. Any change in one mineral changes at least two others, those two each affect two more, and so on.

For example, investigating the single relationship of Calcium to Phosphorus is meaningless if the other minerals are not also considered. A change in one element of a holistic system causes a ripple of changes in all the rest.

The same is true in any milieu, whether it be the health of one animal or of the entire farming operation and human community. As Barry Commoner once stated, "Everything is related to everything else."

I believe the only way to assess the value of holistic principles is common-sense observation of the results of using those methods over a long period of time. All one needs to do is to take a look at the health benefits to crops, animals, humans, and the environment resulting from the practice of holistic, sustainable agriculture.

There are many good researchers today. One of the best is Fred Provenza, PhD. He is professor emeritus of Behavioral Ecology in the Department of Wildland Resources at Utah State University. He is the author or co-author of 230 publications in peer reviewed journals and books. He does not specifically address the value of self select minerals, but his work



gives considerable insight into the ability of animals, and humans, to self regulate their nutritional needs. Fred's newest book, *"Nourishment - What Animals can Teach Us About Rediscovering Our Nutritional Wisdom"* was recently published. It contains the essence of his life's work and contains much valuable information for anyone that eats food or feeds animals.

What Goes Around, Comes Around

December 7, 2019

"What goes around, comes around" has a couple of meanings. One is that there are consequences to everything we do — we reap what we sow. Another connotation has to do with the cyclic repetition of events, thoughts, or activities. The length of time for the cycles to occur is variable.

When you are 85 a lot of things "coming around" have already "gone around" — maybe more than once. When you're younger, many significant cycles have not had time to 'go around' and they are not readily apparent to the casual observer.

The periodic changes in clothing styles, especially the length of women's skirts is one example. Changes in scientific perception is another. — "The scientific 'truth' of today becomes the discarded error of tomorrow."

There are also cycles in agricultural practices. As an example, there is a commentary in EcoWatch entitled *"Soil Health: The Next Agricultural Revolution"*. It is a good article and well worth reading. (Check it out at <https://www.ecowatch.com/soil-health-as-the-next-agricultural-revolution-2625362894.html>)

The opening paragraph reads, *"By adopting three practices—no-till farming, cover crops and diverse crop rotations—farmers worldwide can help preserve the world's soils, feed a growing global population, mitigate climate change and protect the environment."* This may

sound revolutionary to the current generation but for me it harkens back to the beginning of the organic movement.

Sir Albert Howard's book *An Agricultural Testament* was published in the US in 1943. It described his research on composting in India. He stated, "*The health of soil, plant, animal, and man is one, and indivisible.*" Sir Albert is now known as the *Father of Modern Organic Agriculture*.

Howard's book inspired J. I. Rodale to begin publishing the innovative magazine "*Organic Gardening and Farming*" which popularized the organic concept nationwide. Also in the 1940s, Louis Bromfield wrote many books about how he rejuvenated several farms in his native Ohio. His tales not only explained his methods but also romanticized the results. Dr. William Albrecht, at the University of Missouri, was one of the first scientist

to promulgate the idea that healthy animals and man depended on healthy soil and plants.

The common thread here is that all these pioneers from 70 or so years ago advocated similar agricultural practices almost identical to those cited in the above article – build organic matter, minimum tillage, cover crops, crop rotations, and eschewing the use of chemical fertilizers, herbicides and insecticides.



Hopefully, we will be able to break out of the stranglehold government now has on true organic agriculture and allow the new “revolution” to succeed. What goes around, comes around.

Why DO Nutritionists’ Reject Animal Wisdom?

December 29, 2018

I have often wondered why more main-stream livestock nutritionists do not embrace the concept of animal nutritional wisdom and shun the use of cafeteria-style mineral feeding.

When questioned about this, many will opine, “Well, animals in the wild may have done this, but domestic animals have been bred-up to the point they have lost this ability.”

Some will point out our domestic animals often overeat grain or protein supplements. This is true because these feeds are not inherently natural to ruminants. They rarely, if ever, overeat pasture or minerals.

Other nutritionists and dairymen give lip service to the need for a better way to quickly adjust for the ever changing mineral needs of animals but continue to reject self-select, cafeteria-style mineral feeding — possibly because of peer group pressure to conform to conventional industry standards.

I do not deny nutritionists are able to wring out a lot of milk from a herd of cows — but at a huge cost when one considers the average dairy cow in our country is ‘burned-out’ at an early age and rarely completes even two lactations.

Modern nutritionists rely heavily on computer generated Total Mixed Rations (TMR). Data from feed testing is entered into the ration balancing program. These

figures may indicate chemical composition but not necessarily bio-availability. A ration is then generated that conforms to the nutrient requirement tables published by the NRC (National Research Council). These recommendations may or may not apply to the situation at hand. The computer 'crunches the numbers' and spits out a recommended ration that purports to meet the nutritional needs of all the cows in the group.

Upon receipt of the print-out, the dairyman or his workers still must assemble the feedstuffs, properly measure and mix the ingredients, and then deliver the final ration to a feed bunk adequate to accommodate all the cows. This series of steps is fraught with opportunities for mistakes. What the cows actually get into their metabolism may bear little resemblance to the computer print-out. Check out: <http://www.docholldaysblog.com/docs-blog/what-are-you-really-feeding.html>.

The problem is that a TMR fails to allow for variation in individual nutritional needs. There is no such thing as an "average" cow. With a TMR only a few cows may get precisely what they need — but some get too much of one thing or another and others get too little. When thinking about averages consider this: "If you have one foot in boiling water and one foot in freezing water — on the average your feet are comfortable."

The bottom line is there is no way to ascertain and correct the nutritional state of the animals unless and until obvious signs of malnutrition occur. If I were a dairyman or a dairy nutritionist I would insist on the presence of a full array of separate self-select minerals.

A properly installed and managed cafeteria-style mineral feeding system provides many benefits.

- It is an excellent method to insure precise, balanced mineral intake for each individual animals. It allows for the immediately adjustment for changes in the daily and seasonal needs of the individuals in the herd.

- It is a safety net and diagnostic tool that highlights problems associated with mineral imbalances caused by changing feed quality or environmental conditions.

I think we should continue to use our accumulated scientific knowledge when compounding rations for animals, and also to let our animals exhibit their nutritional wisdom to fine-tune the computer generated ration — thus combining the best of the two concepts.



Epigenetics: "... the 'blood' is still there."

Monday, January 28, 2019

In the early and mid years of the last century it was not uncommon for folks with lots of money to spend to buy a ranch and stock it with pure-bred cattle. Many of these enterprises were successful and many were not. Novice ranchers were prone to make mistakes in managing the

care, breeding, and nutrition of their cattle. This usually led to a degradation of the appearance and productivity of the once fine looking breeding stock. The end result was frequently a dispersal sale — selling the cattle at auction.

My good friend and client, Evan, was a prominent and successful breeder of pure-bred polled-Hereford cattle in Missouri. His knowledge of the bloodlines and families of Hereford cattle was unsurpassed. Moreover, Evan was an innovative herdsman. He fed his cattle well and was innovative in his approach to animal nutrition. He was adding Wheat Germ Oil to the ration of his breeding a long time before livestock nutritionists recognized the value of Vitamin E.

If the dispersal sales mentioned above involved Hereford cattle with bloodlines compatible with those in his herd, and was located within a reasonable driving distance, Evan would attend the sale. He rarely came home empty handed.

Evan would keep his new purchases separate from his main herd for a week or two just as a precaution. During the quarantine period he would call me to do a health evaluation. The first time I did this, I was somewhat taken aback, as the new animals were not good specimen of the breed. Evan noticed my dismay and said, "Yeah, I know they look like Hell, but they didn't cost much and the blood is still there." He explained that by 'blood' he meant the bloodlines or genetics were intact and opined that good nutrition could build them back up. I was not convinced.

After some years, though, whenever I made a farm visit, Evan would point out individuals in his herd that would have graced any Hereford show-ring. With a grin on his face he would remind me, "Those are all direct 2nd or 3rd generation descendants of the animals you ridiculed years ago."

Evan may not have understood the fine points of epigenetic as we now understand it, but he intuitively

employed the basic concept of epigenetics decades before it appeared in the scientific press.

In simple terms, epigenetics is the study of changes in gene expression that occur without changes in the genetic code itself — genes are not set in stone as previously thought, but are like switches that can be turned off or on by various factors such as nutrition, stress, drugs, and sundry environmental factors — “and the ‘blood’ is still there.”

The resulting change in genetic expression may persist for generations. As one researcher noted, “If you are of reproductive age, whatever you take into your body— food, drink, drugs, air — may affect the health of your great grandchildren.” These alterations can be good or bad — going down hill in the aforementioned mismanaged herds or climbing back uphill in Evan’s herd.



A Tribute To Mules

Monday, April 15, 2019

Missouri has been famous as a producer of quality mules for many decades. The mule has been designated as the official state animal of Missouri. Having been born and

raised as a Missourian, I have always been fond of mules. The sight of a splendid, matched team of mules all decked out in their parade regalia moving out at a fast trot is as inspiring to me as the Anheuser-Busch Clydesdale's.



Surveys both here and in the UK indicate that most people, even those in equestrian circles, do not know very much about mules. Here are some nuggets of information about these unusual and fascinating creatures.

A mule is the offspring of a male donkey or jack, and a female horse. Horses have 64 chromosomes, donkeys have 62, and mules and hinnies have 63. Because of this odd number of chromosomes, mules are 99.9 percent sterile.

The size of a mule depends largely on the breeding of the mule's female parent.

Mules can live up to 50 years, with an average lifespan of 30-40 years.

A male mule is called a john or horse mule. A female mule is called a molly or mare.

A group of mules is called a 'barren', probably because of their reproductive sterility.

A female donkey is called a jennet and can be bred with a male horse to create a hinny.

Throughout history mules have played major roles as beasts of burden during wars. Mules were used to carry artillery, food, supplies and even wounded soldiers on the battlefield in WWI, and subsequent conflicts up to and including Afghanistan.

There are just under 10 million mules in the world, and the majority of these are working in agriculture or as pack animals in isolated areas.

Legend has it that George Washington is “The Father of the American Mule.” In 1785, King Charles III of Spain presented Washington with a large Spanish jack. Another gift of a Maltese jack and two jennets from French General Lafayette was received in 1786. These animals provided the genetic base for the American mule.

Mules are prized for their hybrid vigor, strength, endurance, and resilience. Mules are reputed to be more intelligent, patient, hardy and long-lived than horses. Mules have a reputation of being stubborn. I believe this is unwarranted and stems from the fact a mule is too smart to work itself beyond the bounds of healthy behavior.

The expression ‘kick like a mule’ stems from the fact that, unlike horses, mules have no accessory ligament that limits lateral movement in the hip joint. This allows them to kick sideways or as some say ‘cow-kick.’ Horses can only kick backwards.

Famous Americans—including Mark Twain, Buffalo Bill Cody, Harry Truman, Ronald Reagan—have ridden mules. Ken Curtis in his “Gunsmoke” role as Festus rode a male mule named Ruth.

Finally, for those concerned about climate change, mule farts contain less methane than horse farts.

It has been said that the mule is an animal with no pride of ancestry and no hope for posterity—Nevertheless, these

noble animals seem to go through life with a regal equanimity that belies their humble beginnings.

Change the Way we Look at Things.

Tuesday, April 23, 2019

The noted Dr. Wayne Dyer once said, "If you change the way you look at things, the things you look at change." The ever unfolding science of Epigenetics has certainly changed the way we look at many aspects of genetics and health in both humans and animals.

A good example of this is a recent internet item entitled, *"Growing Up Poor Not Only Affects Your Health, It Changes as Many as 1 in 13 Genes."*¹ This article provides new insights into the already known problem of 'growing up poor'. Poverty not only effects physical and mental health but has the potential to alter the expression of your genetic makeup.

Epigenetics involves chemical changes to DNA that prevent or enhance the effect of a gene sequence. The study revealed nearly eight percent of our genome can be affected by chemical edits that could stick with you for life. These changes have the potential to be passed to future generations.

The World Health Organisation estimates some 1.2 billion people across the globe are making their way through life on less than a dollar per day. The persistence of the by genetic changes passed down through the generations does not bode well for a quick fix to worldwide poverty.

I think most of the principles illustrated here apply to our animals as well as humans. I don't know how to describe what 'growing up poor' means to our domestic animals. I suspect it has mostly to do with poor nutrition along with some environmental or emotional stress. Young animals suffer from malnutrition or severe illness during their early years

¹ <https://www.sciencealert.com/being-poor-not-only-affects-your-health-it-changes-as-many-as-one-in-13-genes/amp>



never to reach their full potential for health and production. As in humans these traits are passed to succeeding generations.

In times past it was not uncommon for some dairies to have five or six generations of animals in the herds. I attribute this to the beneficial epigenetic effect of stable nutrition and environment over the generations. Obviously this does not happen much today. The average dairy cow in this country dies at about 54 months of age without reaching adulthood. This is a sad commentary on our dairy industry.

Years ago a study was done on groups of Iowa pigs. Young pregnant gilts (Gen 1) were fed a diet deficient in nutrients and minerals. The offspring of these animals (Gen 2) were evaluated for any adverse effects from the poor diet. Amazingly these pigs performed as well as their dams and showed no obvious bad effects.

Then, gilts from the Gen 2 group were fed the same deficient diet and their offspring (Gen 3) were evaluated. These animals showed a multitude of effects, including low weight gain and unthriftiness. Many of them seem to revert back to an almost primitive 'razer-back appearance and did not show typical appearance of their breed.

Gilts from this group (Gen 4) were then fed an adequate diet to see if they would reverse the previous damage. They did not.

Gilts from this group were also fed a good ration and their offspring (Gen 5) again exhibited characteristics of the breed with good production and health.

The above study provides a good example of the epigenetic effect of good nutrition or bad nutrition in several generation of swine.

Providing good nutrition and balance minerals to our livestock has no downside. <https://www.sciencealert.com/being-poor-not-only-affects-your-health-it-changes-as-many-as-one-in-13-genes/amp>

Looking for "Tells"

Tuesday, April 30, 2019

I am not a poker player but I do enjoy reading about people playing poker and watching some of the famous poker games in old movies. I am amazed how the professional poker player, after a few beginning hands, can predict which of the other players have good or bad hands-on subsequent deals. They do this by observing slight, almost subliminal, gestures, eye movements, posture, and other body language clues that "tell" the condition of his opponent's poker hands. These "tells" allowed poker players to have a better idea about what's going on at the poker table.

This reminded me of my old friend Dr. Bob Scott who often said "The most productive time a dairyman spends, is leaning on the fence watching his cow." I think it's another way of saying he is looking for "tells" in his cows. There are many ways for an astute dairyman to be on the lookout for "tells" of his cows in the same way poker player reads the cards held by his opponents. They both benefit immensely from the knowledge thus gained.

There are many obvious "tells" known to most dairymen — body condition, eating habits, breeding efficiency, lameness, and others. I would like to suggest another procedure that will give valuable 'tells" into other often overlooked areas.

The procedure is to provide a full array of self-select cafeteria-style minerals to your cattle and observe what they



eat. Here are some “tells” other dairymen have noticed.

Sudden changes in the eating pattern of the mineral can be an early warning of problems and a safety net for problems that can creep into a herd — faulty nutrition being a common one. Animals will change their eating habits over night when the nutritional value of their ration changes.

An unusual appetite for eating dirt and chewing on wood is common. Animals eating dirt, especially clay, can indicate a problem with rumen acidosis. If available, they will consume a lot of buffer. They will also benefit from free choice access to old hay with low protein and high fiber. Chewing on wood is thought to be associated with a phosphorus deficiency.

Animals forced to eat moldy feed will often eat a lot of I-Mix.

While we usually think of mineral consumption in terms of deficiency, excesses also influence consumption.

Animals under any kind of stress will usually consume more BVC Mix.

High nitrates in the water, coupled with high protein in the ration can result in nitrate toxicity and increase the need and consumption of A-Mix.

Most TMR's use dicalcium phosphate as a mineral source.

The higher calcium level will usually result in high consumption of P-Mix (Phosphorus) to balance the Ca/P ratio. Watery eyes in dairy cattle is a "tell" indicating either a toxic condition wherein they are shedding down some of the toxins in their tears or it could be a vitamin A deficiency.

When starting on a self-select mineral program, animals will not only consume minerals for their daily needs, but also to replenish the low mineral reserves in bone and tissue caused by mineral deficiencies in previous rations. It may appear for a while they are eating excess minerals, but they only eat what they need.

Do Cafeteria-Style Minerals Work Better in Organic or Conventional Dairy Herds?

Wednesday, May 15, 2019

I have often been asked to compare results of smorgasbord mineral feeding in different situations. Since there is no clear meaning to either 'organic' or 'conventional' — my quick answer would be, "That depends."

First of all, it is important to understand that feeding 'ground-up rocks' to supplement minerals is, at best, just a bandaid. The real problems are low mineralization of feedstuffs (from decreased soil fertility) and reduced nutritional diversity (from confinement).

It helps me to envision a spectrum or range of mineralization levels in feedstuffs with highly nutritious feeds at one end and lower quality feeds at the other end. On this continuum it is possible to plot and compare different response to cafeteria-style mineral feeding situations.

Animals being fed nutritious, highly mineralized feeds from the top end of the range will generally have low mineral consumption or perhaps eat none at all. Many, but not all, 'organic' dairies fall into this category, as do rotational grazers. Minerals consumed will probably be used to correct minor



imbalances rather than gross deficiencies. Many of these dairy farms will have a long record of soil building.

On the other end of the spectrum, animals in large, intensive, high stress dairy operations will normally consume more minerals to compensate for the lower mineral content of the feedstuffs. Most of their rations will be composed of feeds of variable quality purchased from various sources.

Then too, feeding a TMR often provides too much calcium and protein. Excess protein (along with high nitrates in the water) increases the need for Vitamin A. The excess Calcium forces the cows to eat more phosphorus to balance the important Ca/P ratio. Stress of any kind, especially stray voltage, increases the need for Vitamin B.

When starting out, all animals will eat minerals to satisfy their daily requirements and enough extra to begin to replenish previous long term deficiencies. Excess mineral consumption in any herd may be a sign of other problems such as stray voltage, geophysical influences, bad water, weather changes or other environmental influences.

If any of these problems are present, it would benefit the dairyman to at least partially correct them before starting to feed cafeteria-style minerals.

So where does it work the best? I think it is a toss-up! The farm with fewer problems and less mineral consumption benefits from the superb animal health achieved. On the other hand, 'conventional' herds have more room for improvement and will be greatly rewarded as many of their problems are reduced.



A "Paleo Diet" for Livestock

Wednesday, August 14, 2019

The popular Paleo Diet, also known as the caveman or stone age diet, is an intriguing concept. It purports to mimic the diet of hunter/gatherers in the Paleolithic era. However, recent studies have revealed some of the same potential health problems associated with other similar high protein/low carb diets.



I believe the diet would be more effective if it encompassed some other aspects of the paleo world. For example, I doubt paleo-man always enjoyed three square meals every day — thus adding intermittent fasting to the regimen would be of benefit. Likewise, paleo-man had to work harder than today's office dwellers just to eat and survive — so adding a strenuous exercise program would be indicated. Like a three-legged stool, a program involving diet, fasting, and exercise is more stable and would come closer to duplicating paleo-man's environment and ancestral lifestyle.

While they cannot always be controlled, there are other variables to consider.

The nutritive value of paleo-foods has undoubtedly changed over 10 millennia since paleo times. Soil depletion over the centuries mandates some form of mineral supplementation for good health in any era.

Ethnic groups evolving in different parts of the planet would develop specialized digestive abilities to match their different food choices. For example, Inuit's from close to the Arctic Circle as compared to a native living in an equatorial rain forest.

Digestive efficiency has changed but not so much as to prevent the animal's return to an ancestral diet if provided.

Pondering the ramifications of the cave man diet led me into some interesting byways of speculation about the applicability of this concept to how we manage our animals today. I wonder;

Do animals have an inherent species-specific metabolism that thrived on a certain nutritional and lifestyle environment? If so, are we meeting those needs?

Have their nutritional needs and digestibility's changed over the millennia?

Would animals be benefited by a return to an ancestral diet and lifestyle and, if so, how?

According to scientists, there were clusters of animal domestication in different places about 10,000 BCE, give or take a couple thousand years either way. This generally correlates to the times when humans were transitioning from a hunter-gatherer society to agrarian society or stay-in-place form of agriculture.

There is evidence dogs were tamed in Europe and Siberia 33,000 years ago. Being carnivores by nature, there is a lot of similarity in their ancestral diet and that of today. There is controversy even now about including grain in a canine diet.

Some findings show cats living in close proximity to man in Cyprus around 9500 BCE. I doubt there is any confirmed evidence cats have ever actually been domesticated to the point of being subservient to humans. .

Pigs domesticated 15,000 years ago. As omnivores, pigs are extremely adaptable as evidenced by the ease at which escaped pigs can revert to a feral lifestyle.

The lifestyle of sheep and goats as grazers and browsers is not much different than when first tamed about 12,500 years ago.

One of the greatest lifestyle changes occurs in some horses. First domesticated in the Eurasian Steppes around 3500 BCE, horses were prey animals and led a nomadic life, ranging over wide areas because of predator pressure and the quest for food and water. Their forage was low in moisture and low in nutritive density.

Now our pleasure horses are fed a totally inappropriate diet of high-moisture, high nutritive density grain and forage. They spend most of their time in a small paddock or box stall and get little exercise — a lifestyle totally different from their native environment, and then we wonder why they have health and emotional problems.

Cattle were domesticated from the wild aurochs in the areas of modern Turkey and Pakistan around 10,500 BCE. Today some range cattle still enjoy that environment, but many do not. In my opinion the huge mega dairies are not only an environmental disaster

but also a blatant example of animal abuse.



The average dairy cow in the US rarely completes two lactations, never reaching adulthood. At calving time, an astounding 50% of the cows suffer from either a metabolic disease or an infectious disease, and sometimes both. Many of the rations contain

high amounts of grain which causes rumen dysfunction. Most of these poor beasts are raised, from birth, in total confinement and never even see grass — a sad commentary on animal welfare in this country.

A bright spot in the dairy industry is the grazing movement. Animals are allowed to graze pastures when available. Forward thinking dairymen transitioning to this program see a multitude of benefits to animal health and productivity as they begin providing dietary and lifestyle condition, compatible to the inherent needs of the animals.

Bottom line: Even small steps to duplicate a native diet and environment will be beneficial to the health and productivity of our animals.

Do Animals Eat Minerals Because They Need Them or Because They Taste Good?

Thursday, August 22, 2019

Animals eat minerals because they taste good, but they only taste good when they are needed. I know that sounds like gibberish, but consider this: Appetite for any given mineral is governed by a biological feedback loop that involves taste buds, the cellular tissue concentration of the mineral, and the solubility of that mineral in the feed. When the taste buds are triggered by deficiencies of nutrients in the tissue they are able to recognize the needed nutrients. In this case, solubility equates to palatability - it tastes good if you need it. When the animal reaches satiety for that mineral, it doesn't "taste good" anymore and they quit eating it.

This is the innate physiological ability of animals that allows them to pick and choose the elements they need from a properly presented, cafeteria-style mineral program. It is this same trait that allows grazing herbivores to balance their ration for energy, protein, and minerals in one 6 to 8 hour grazing cycle — if the proper nutrients are available in the pasture.

When beginning a self regulated mineral program, it is not uncommon for some animals to consume considerable amounts of certain items. In addition to filling their immediate requirements, animals will also eat to compensate for previous deficiencies; e.g. to replace bone mineral loss or liver reserves. It may take 3 to 6 months for this apparent over-consumption to taper off. If it does not taper off, one needs to check other issues as described below.

Animals will seldom over consume minerals unless forced to do so because of improperly formulated rations or mineral supplements. For example, if there is too much Calcium in a TMR ration, animals will eat excess Phosphorus from a cafeteria-style mineral program, to balance the Ca/P ratio. Consumption of P will go down if some Ca is removed from the force-fed ration. If feeding a TMR along with a cafeteria-style mineral program, it is best to add only about 50 to 75% of the computed amounts of minerals. This allows the animals to fine tune their mineral balance with out over consumption.

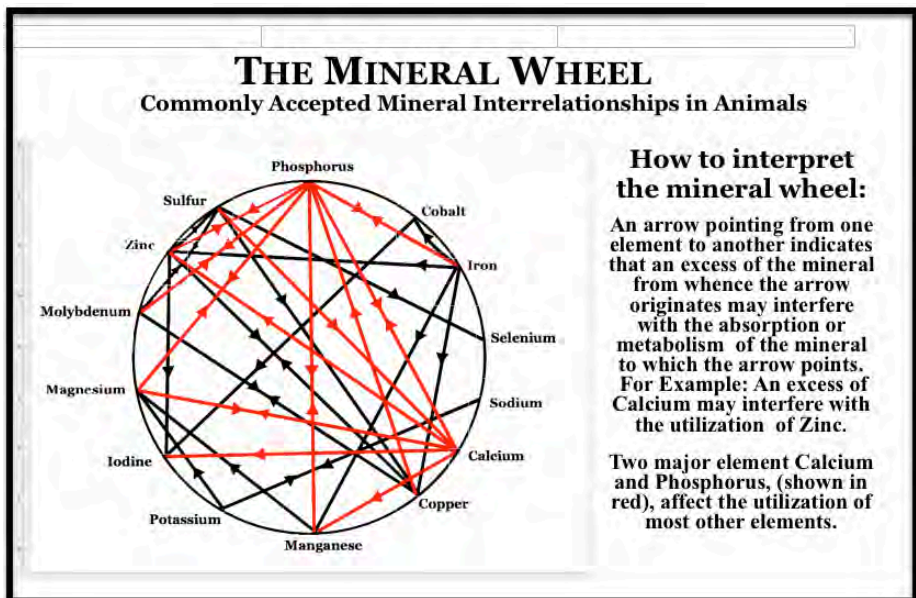
ADE consumption goes up if there are high nitrates, excess protein or basic deficiencies in the feeds or ration, e.g. consumption goes up as hay and forages age and deplete in vitamin content.

BVC and Vitamin C intake increases with stress. Stress can be caused by many situations; including bad weather, extreme high production or performance, relocation, bad water, stray electrical currents, and geo-thermal events.

Iodine consumption increases if nitrates are high, if subjected to stray voltage or geo-magnetic fields, or if they are fed moldy feed.

Animals will often change their mineral consumption overnight in response to ration changes or anticipated weather changes. If consumption changes after stabilizing on the FC system the changes could be caused by changes in seasonal needs or ration changes. e.g animals frequently take more sulfur when the are building a new hair coat in spring and fall.

There is the possibility that some animals may possess or develop a taste for a particular ingredient. Little weight should be given to that opinion unless and until the other factors listed above are investigated and eliminated.



Right Under Your Nose.

Sunday, August 25, 2019

For months I had been bothered by strange noises coming from outside my upstairs office. When it was windy out, I would hear thump, thump, thump of varying intensity. Listening with the window open gave no clue as to where the sound emanated. Could it be a tree limb banging on the rain barrel or a wire tapping on the roof or garage wall? I would even stand for several minutes, outside on the deck or drive, hoping to triangulate the direction of the sound's source. All to no avail.

Finally, I called in our friendly handyman, Bruce. He climbed out the window onto the porch roof and said, "Ah ha. Here's the problem". It was a loose section of the eave trough. He fastened it down with a screw and the problem was solved. I could have reached out of the window and touched the offending noisemaker. As my mother used to say, "I don't know why you couldn't find it — it was right under your nose."

I wonder how many other situations we encounter where the problem, and possibly the solution, is right under our nose — if we would just look for them closer to home and not in some far-off more glamorous place.

We live in violent times, rightfully appalled by school shootings and other acts of public violence. Violence is ingrained in our society. Could it be because our children are subject to visual, graphic violence on TV and in the movies, from the first day they are propped up in front of the TV? A recent study calculated that children viewed about 8,000 murders while watching public media — before they leave elementary school! The report did not include the number of attempted rapes or other acts of personal violence available for viewing.

When children grow up and act violently we look for causes in politically expedient places and ignore the commonplace TV programs and movies that are, figuratively speaking, right under our noses.

TV advertisers know how easily we can be influenced by the media, but we ignore the apathetic attitude toward violence it fosters in our society.

Modern agriculture also has some “right under your nose” problems — or in this case, perhaps it would be more accurate to say “right under your toes”. Much of our once fertile soils have been depleted and contaminated to the point that much of our land no longer produces healthy, life-sustaining crops.



“Science” proposes many seemingly innovative solutions — but as Albert Einstein so succinctly put it years ago, “Problems cannot be solved at the same level of awareness that created them.” Most soil scientists realize the main problem is a deficiency of highly carboniferous organic matter (OM) in the soil. Building back OM has many benefits, not the least of which is removal of Carbon from the atmosphere. This pleased those fascinated with climate change and

allows them to promote the process by using the catchy phrase ‘carbon sequestration.’

In closing, here is another quote from Albert Einstein, “Technological progress is like an axe in the hands of a pathological criminal.”

Hey, Doc! Waddya got for worms?

Monday, September 2, 2019

“Hey, Doc! Waddya got for worms?” — or something similar is often heard by large animal veterinarians. It usually indicates they have a parasite problem in one of their animals or in the whole herd. It is a simple question, but one with a complex array of answers depending on host species, parasite species, whether the animals are being managed by organic or conventional practices, and many other variables.

This is not an exhaustive discourse on parasitism in large animals but rather a brief exploration of some natural principles to help avoid parasite problems without resorting to toxic chemicals.

First of all, it is important to remember that parasites, bacteria, insects, and weeds are “censors of nature” whose function is to do away with sick or undernourished animals. Check out: <http://www.dochollidaysblog.com/docs-blog/censors-of-nature.html>

For example, insects will seek out damaged or poor quality vegetation while animals will seek out and eat the most nutritious, highly mineralized, grain or forage they can find. In the same way, internal parasites are attracted to animals of sub-standard health. Thus, a malnourished or unhealthy animal is the ideal host for any lurking parasites. The two main things to consider here are a healthy gut with a good population of beneficial organisms and a balance of internal, cellular mineral.

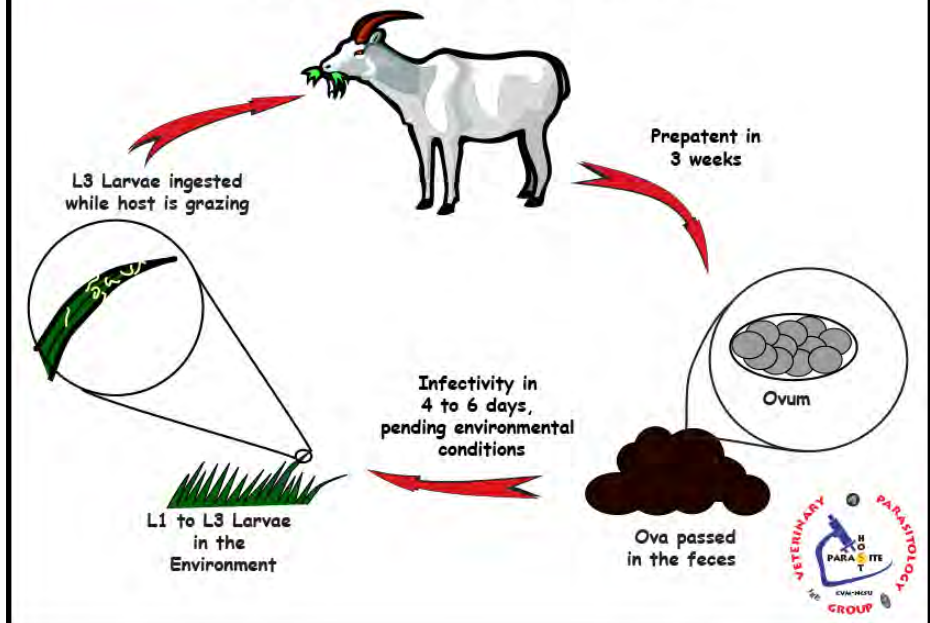
Don't overlook the role of genetic immunity in controlling parasites. Genetic resistance can be improved over time by selective culling of animals showing the greatest susceptibility to worms. It is interesting to note that healthy animals will often test positive for some intestinal worms. Low level infestation seems to be Nature's way to provide a reservoir of antigens that stimulate immunity in the host.

Some environments are not conducive to raising livestock. Avoid wet, marshy areas. They are prime locations for exposure to worms and flukes — difficult to control under most circumstances. In any case it is advisable to correlate pasture occupancy with the life-cycle of the worm.

There are natural alternatives to chemical wormers available. These products do not kill parasites but act to make the intestinal environment unsuitable or uncomfortable for adult and juvenile parasites. Some items to look for:

- A broad spectrum self-select individual mineral program.
- Probiotic and prebiotic sources of lactobacillus cultures.
- Chinese herbs -used as an aid to parasite control for over 2000 years.
- Bentonite, proven to condition the digestive tract, creating an environment that is not accommodating to parasites/worms.
- Diatomaceous Earth is a time-tested aid to parasite control.

Haemonchus contortus



"I dunno, I guess there's
sumthin in it they need."

Tuesday, October 1, 2019

In the early 1960s, shortly after I began a vet practice in Missouri, I was called to treat a sick animal on a hill country farm NW of town. The owner, Glenn, had called me several times in the past, so I was somewhat familiar with Glenn and his operation. This time, as I was getting ready to leave, he said, "If you have time, I'd like to show you something interesting." I said "Sure", and we climbed into his 4WD pickup and drove up into the hills on the back side of his farm. We came to a ravine or coulee several yards wide, and with almost perpendicular walls, you could easily see the different layers that made up the soil profile. Several cows were in the gully and some were licking at

one of the layers. Glenn pointed out that this layer had been stripped out to the depth of a cow's tongue.



Glenn said that every spring, when he first turned out his herd they would all congregate in this gully and lick on one narrow layer of the clay walls. They would occasionally visit the gully during the grazing season. The exposed layer did not look much different than the rest of the walls but Obviously had a great appeal to the cattle.

As this was several years before I encountered the concept of self select minerals, I was at a loss to understand what I was seeing. I asked Glenn, "Why do you suppose they do that?" He answered, "I dunno, I guess there's sumthin in it they need."

Looking back, that's a pretty good explanation and still valid today when someone asks, "Why do animals eat what they do?'. All our nutritional knowledge is no match for the nutritional wisdom of our animals.

I never did find out the ingredient the cattle were after. It could have been a layer with a high level of an essential mineral or more probably it was a particular type of clay similar to bentonite, attapulgite or montmorillonite clay. It is not uncommon for cattle or horses to eat plain dirt (probably for its clay content) to alleviate digestive problems. Many different

types of clay have a long history of use in humans and animals. Some of the effects and benefits follow:

Clays physically bind to acids and toxic substances in the stomach and digestive tract.

Clays provide a source of silica, essential to all body tissues.

Clays absorb heavy metals.

Clays detoxify by reducing mineral imbalances.

Clays bind aflatoxins, mold and fungal toxins, de-wormers, and antibiotics.

Clays have antidiarrheal properties and may work by adsorbing the diarrheal pathogen.

If you do not have a source of clay on your farm, I suggest you provide some clay products for your animals. The health benefits may surprise you.

How Many Will Starve?

Saturday, October 26, 2019

In 1971, then US Secretary of Agriculture Earl Butz uttered these unsympathetic words: "Before we go back to organic agriculture in this country, somebody must decide which 50 million Americans we are going to let starve or go hungry."

In almost 70 years, things have not changed much. A new study from the UK's Cranfield University repeats basically the same old tune when it says, "Organic practices can reduce climate pollution produced directly from farming – which would be fantastic if they didn't also require more land to produce the same amount of food."

While the study acknowledged the benefits of organic farming their basic premise seem to be that because of the alleged lower yield of organic crops more land is needed to feed the world's burgeoning population.

Here are some statements from the articles:

- The switch to 100% organic practices would require 1.5 times more land to make up for the declines.

- Organic farming produces more climate pollution than conventional practices (ONLY) when the additional land required is taken into account. Note; I added the above 'ONLY' to clarify the meaning of the sentence.
- Organic farms tend to produce less food than non-organic ones. The big problem, for both crops and livestock, is that these practices end up requiring a lot more land to produce the same amount of food.
- Some earlier studies determined that organic farming yields are between 5% and 34% lower than those from conventional agriculture, depending on the specific crops and practices. A 2017 Nature Communications study estimated that switching to organic farming would increase land use by only 16%.
- Some sources cite an average 20 per cent lower yield for organic crops compared to conventional crops.

The conclusion of this report is predicated on the assumption that conventional crown crops out yield organic crops and that conventional crops have the same nutrient density as organic crops.

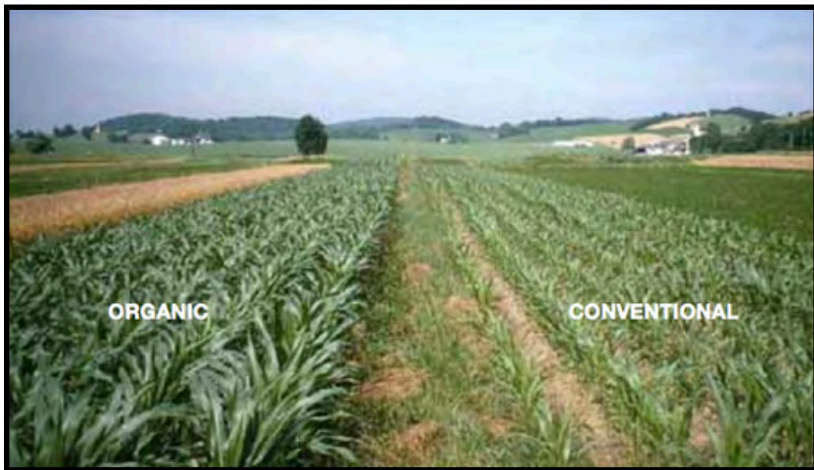
There seems to be a lot of ambiguity about land needs and crop yields in the above statements. I believe the 'so called' difference in yield would disappear if nutritive value per acre were compared.

Earl Butz, the folks at UK, and many others, all make the same mistake. They apparently believe all crops, organic or conventional, have equal nutrition. If yields were measured in nutritive value per acre rather than pounds, bushels or tons per acre it would be a more accurate picture of productivity.

For example, conventionally grown corn (maize) will frequently test 1 to 3 percent lower in protein than organic corn (a 20% reduction in nutrients). Chemically grown corn tends to retain moisture at harvest and needs to be artificially dried, further reducing its digestible protein — and burning a lot of fossil fuels to provide the heat. In this example, allowing for a 20% reduction in yield, the organic corn still provides more nutrition per acre. I believe this same concept can be applied to many, but probably not all, of our crops.

I know of no research that has addressed this issue so I don't have any study to quote, but I do know this — animals know the difference between nutrient rich food and look-alike but not so nutritious food. Deer will walk past miles of conventional corn to feast on organic corn. The same is true of any domestic animal if it escapes confinement and seeks out nutritious sustenance. I have seen hogs starve themselves for two or three days in protest to being switched from organic feeds to conventional.

We bemoan the fact of soil depletion but tend to overlook the fact that nutritive value of crops has also declined especially the mineral content. This is apparent in animal feeding. Back in the day when we were still almost all organic, a basic mineral mix for animals was equal parts salt, ground limestone, and steamed bone meal. It was adequate for most situations as the crops and soils were still highly mineralized. Not so today, as livestock now need well-balanced mineral supplementation. Many innovative livestock owners have opted to take advantage of their animal's nutritional wisdom by providing self-select or cafeteria style mineral programs.



Some footnotes:

6. I do not like the term organic.. It has so many different meanings and connotations it is almost useless. It is even more ridiculous when used in terms such as, "Certified Organic Hydroponically Grown Lettuce." Sheesh! Give me a break.

7. <https://www.technologyreview.com/s/614605/sorryorganic-farming-is-actually-worse-for-climate-change/>

8. <https://www.newscientist.com/article/2220659-going-fully-organic-would-raise-greenhouse-gas-emissions/>

Lactobacillus—the Sour-milk Bacteria

Tuesday, November 12, 2019

Lactobacilli are almost ubiquitous in our natural environment, being present in milk and on growing plants. Considering that our use of yogurt and cheese goes back into antiquity, lactobacilli have benefited mankind for a long time.

My first recollection of lactobacilli use in animals goes back to the 1930s. My Uncle Gustave was a seasonal grazer and dairyman in central Missouri. During the summer months, he and his wife, Aunt Anna, milked 8 or 10 cows — twice a day — by hand. They didn't have a dairy barn or stanchions but milked their cows out in the cow lot. The only restraint was a few randomly placed feed boxes to keep the cows occupied while being milked — very bucolic.

The milk was put through a hand-cranked cream separator. When they had filled a 10 -gallon cream can they would take it to the railroad station in town where it was picked up and shipped to St. Louis. While at the station, he retrieved an empty can or two to take home for the next batch of cream.

The skim milk, loaded with natural occurring lactobacilli, soon turned sour, clabbered up, and eventually was fed to the chickens or pigs. Skim milk, corn, and wheat shorts, was a balance ration for swine. Given the high protein content of the corn back then, soy-

bean meal was not needed to balance the ration. This scenario, repeated thousands of times, was probably the start of feeding lacto to animals. While many folks observed the benefits of feeding sour milk, it was not commercialized as it is today.

After Fleming's discovery of penicillin, in 1927, the search for other antibiotics was on. A soil sample from Sanborn Field at the University of Missouri in Columbia, contained a bacterium that exuded a golden-yellow chemical. In tests, the compound killed a



wide array of disease bacteria, and Aureomycin or Chlortetracycline, the first broad-spectrum antibiotic was patented in 1948 by Lederle Laboratories, a division of the American Cyanamid Company.

At about the same time, a poultry nutritionist at Lederle laboratories added a couple of ounces of the left-over growth medium used in the production of aureomycin to a pen of chicks. The increased growth rate and health of the birds was amazing. He shared the result with colleagues in the animal nutrition community. It didn't take long for the idea of feeding antibiotics to animals to catch on. The feed additive, "Aureomycin Crumbles" could soon be found in almost any livestock facility.

You probably wonder what all this has to do with Lactobacilli! Consider this: the use of antibiotics in livestock started a tsunami of changes in agriculture that still affect us today.

The ability of antibiotics to control bacterial infections, common when animals are crowded together in unsanitary conditions, opened the door for the rise of the common and controversial CAFO's (Confined Animal Feeding Operations).

In combination with antibiotic abuses by the Medical profession, feeding low-levels of antibiotics to livestock started the leap-frog contest between the resulting antibiotic resistant bacteria and new antibiotics.

Lactobacilli and other related beneficial microorganisms have the ability to alleviate and to some extent repair the damage done by the antibiotics. It also has a beneficial effect on intestinal bacteria damaged by glyphosate. There is also some evidence Lactobacilli and related microbes might take the place of antibiotics in the treatment of diseases.

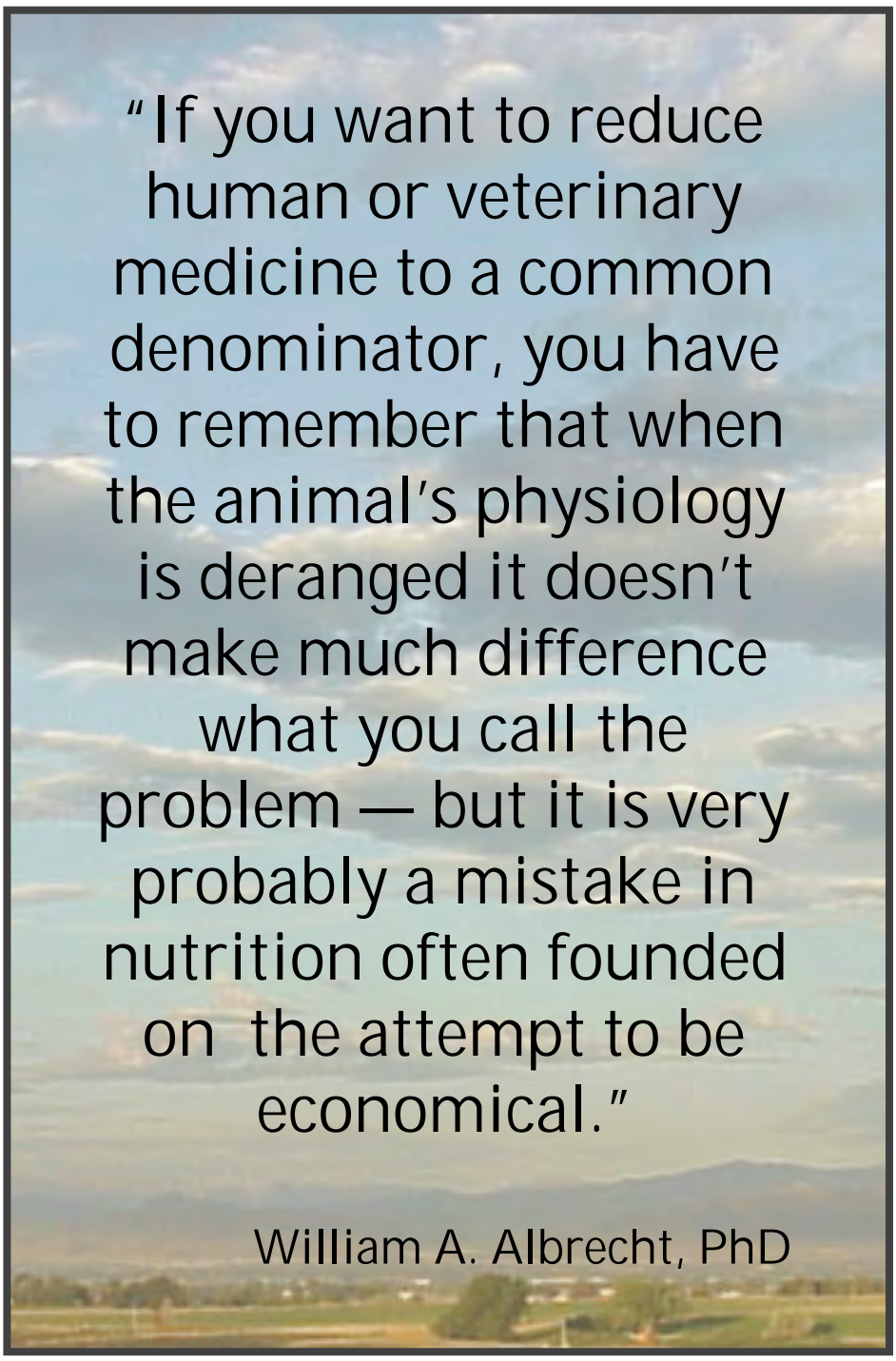
I don't remember when the commercialization of lactobacillus fermented products really started — it was a gradual thing. In the beginning it received a lot of negative feedback from university nutritionists as well as other people in the feed industry.

Nevertheless, innovative companies and individuals began to support the use of concentrated lacto products with varying results as the knowledge grew of how to best use these products. Soon there was a wide range of Lactobacillus products available for use in animals and humans alike.

In my vet practice in the late 70s I used a condensed cultured whey product. It was a highly acidic liquid for oral use. Since it did not contain any live organisms, in today's terminology it would be classified as a "pre-biotic". It had the ability to normalize and promote the growth of beneficial intestinal microflora. I used it in any of my patients with digestive problems. It worked well whenever I used it.

There are many new lactobacillus products available. It is gratifying to know many of the old tried and true formulae are still available — and still effective. The product I referred to above is one such product that has stood the test of time. It is known as "Pro Bi" — available from Advanced Biological Concepts.





“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.”

William A. Albrecht, PhD



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