

MINERALS-FOR MAN AND BEASTS, AND PLANTS NOTWITHSTANDING.

PART TWO OF A THREE PART SERIES

by William G. Winter, DVM

Did you get your homework assignment done from last time? For those that don't remember, the assignment was to get soil sample testing done for your pastures, paddocks and fields. Extra credit is also applied if you asked for the full mineral profile which should include Iodine, Selenium, Vanadium, Chromium and Cobalt. You get even more credit if you did forage tissue sample testing as well. It is commonly said that "livestock don't eat the soil, they eat the plants", but yet we all know that ultimately there are no real shortcuts to fixing the soil problems. On the other hand, tissue samples are quite valuable because agronomists tell us that many soil minerals are abundant, perhaps even excessive, but may not be available to the plant. Many complex mechanisms lock up minerals. For example pH issues, which can be either too high or too low, mineral interactions which block uptake, or even issues with the lack or imbalance in soil biology or poor structure of the soil. Until we begin to "grow" our minerals in the soil, we supplement them. By feeding minerals and rewarding the soil with enriched manure, we find yet another way to accrue valuable assets on the farm.

Mineral deficiencies are one thing, but to add the wrong ones, or to contribute to pre-existing excesses can be even worse. At the very least, it would be wasting money to supplement minerals that already exist. This is the value of starting with the testing.

CHECK THE WATER

It's the most commonly forgotten "wild card" when we try to track the source of mystery herd health problems. When we do water testing, which is always a good idea, we are looking for a fairly neutral pH, around 6.8-7.2 and we hope there are not high levels of minerals such as sodium or iron. Unfortunately, pesticide, heavy metal or industrial contamination problems are becoming more common all across the US.

HOOFBEATS: IS IT HORSES OR ZEBRAS?

Meaning, we work with the most important minerals first, the most likely to be missing and the ones known to be critical for good health, immunity and fertility. We are not going to discuss the major cations and anions again, Calcium, Magnesium, Phosphorus, Sulfur, Sodium and Potassium but not much can occur without these hallmarks of full-farm soil balancing. When chronic health problems occur in a herd it's a "red flag" for something, then the eco-detective work begins.

So now it's time to get serious. Here's what you must know if you want both a successful holistic herd health program and vet bills that approach zero. Bear in mind that, like any nutrient, all of these minerals are toxic in excess. We are only going to talk about deficiencies today, the most common situation. But more than anything else, don't fear these minerals, they are our friends.

IODINE - When I was about 10 my mother had her goitrous thyroid surgically removed. We lived in the buckle of the Goiter Belt of the US but didn't know nuthin'. Of course, none of our livestock needs for iodine were addressed in those days either. Iodine is stored in the thyroid, prostate, udder and ovaries. We now know from research conducted by Jerry Brunetti that animals that get 50 mg/day will not be vulnerable to the twin nemeses foot rot and pinkeye. Gearld Fry has achieved similar results with levels as low as 25 mg/head/day. Supplementation at this level will also prevent many abortions, and stillborns and will help animals breed back as well as assure good libido. Iodine also protects the udder, prostate and uterus from cancer. Iodine deficiency is related to Actinomycosis (lumpy jaw), mastitis and pneumonia. Iodine deficiency will also predispose to spirochete infections (hairy heel warts, Borrelia (Lyme disease) and the various forms of Leptospirosis. Do I have your attention yet?

SELENIUM- This is called the "Protection Mineral" for a good reason, because the body requires it, along with a trio of amino acids to make glutathione peroxidase, perhaps the strongest anti-microbial in the body. Dramatic deficiencies cause white muscle disease along with other disabilities of the nerves and muscles. Huge tracts of land in livestock-growing areas are severely deficient. Many studies show that just by giving adequate selenium one can slash mastitis rates by more than 50% and high somatic cell counts can plummet 70%. Additionally, many serious viral agents are stopped cold by selenium. A truly healthy rate would be about 12-15 mg per head per day. If there was a drug that worked this good the findings would be shouted from the front page of all the major newspapers!

COPPER- Parasites hate it and it's called "Nature's fungicide". Pat Coleby's Australian husbandry books have done a good job of making us aware of the need for copper to prevent external and internal parasites. She is particularly adamant that the small-ruminant browsers such as goats and even sheep get their copper. Additionally, Mark Purdey's landmark work with bovine spongiform encephalopathy (mad cow, scrapie, chronic wasting, and nvCJD) and shown us how pollution, toxins or other environmental disasters combined with low levels of copper cause the condition. It's important to remind ourselves that high levels of iron in the forage or water can bind copper as well, the same being true if molybdenum levels are excessive. Animals need copper to make hemoglobin and critical enzymes such as catalase and tyrosinase. Copper is also a crucial mineral to prevent foot rot and hairy heel wart. Adult cattle need about 150-250 mg a day.

ZINC- One ejaculation from a male animal depletes as much zinc as can be consumed in a day so this mineral is essential for fertility. It's no wonder so many animals are depleted and suffering. A good daily dose is about 1200-1600 mg. The body needs it for

making protein, collagen, and for skin health. The classic symptom of deficiency is Parakeratosis, a flaky, dry, cracked skin, and since the horn and hoof come from skin, deficiency can also result in foot rot or lameness.

COBALT- We are just waking up to the fact that this B-12 (cobalamin) synthesizing micronutrient really is critical and animals that are deficient will be anemic, will have poor growth, infertility and won't live as long. Two miserable conditions, ketosis and Johne's Disease are related to deficiency and can be banished from the farm, just by keeping the minerals adequate. The desired intake should be around 5 mg daily

MANGANESE- An essential mineral for running the immune system, the nervous system and making B vitamins and cartilage. Deficiency usually shows up first in the fertility department as silent heats, low conception rates, abortions, cystic ovaries and too many male calves. So if you want more heifer calves, ewes and does, keep the Manganese levels adequate, that dose being a total of 1200 mg daily. Make sure your levels are low before adding it however, and be sure to keep the copper levels adequate.

MAGNESIUM- Runs over 300 known enzyme reactions and yet 80% of the animals are deficient in it. It's involved with muscle tetany when deficient and deficiencies cause problems with the parathyroid and with regulation of calcium in the blood. A fairly large dose is required, about 5000-10,000 mg daily.

MOLYBDENUM-Hard to spell and trouble if deficient as particularly evidenced in reproductive health. Closely related to copper levels and, if deficient, will allow copper to become more toxic. Also if sulfur is in excess it will tie up the molybdenum. The ideal amount should be about 1/6 the copper level and 1/100 the SO₄ level. Adequate molybdenum drives down the toxicity of nitrate if it's excessive in the forage.

MINERALS TRUMP DRUGS, FEAR AND HYSTERIA

I'll leave you with something to ponder. Charles Walters quotes William Albrecht in his book "Grass-The Forgiveness of Nature" saying "infectious Brucella abortus is about as infectious as a stomach ache" and Albrecht, in his day, taught farmers how to "feed brucellosis out of their herd" before the eradication sharpshooters got to them. The hysteria-fueled and idiotic eradication programs don't really cure anything anyway, they just shift the problem to another disease. By giving animals a cocktail of the salts of manganese, copper, cobalt, zinc, magnesium and iodine, either by correcting the soil or in the form of supplements, early nutritionists such as Dr. Albrecht and Dr. Ira Allison ("the Miracle of the Ozarks") were able to prevent or cure all the serious, infectious diseases of the day. Repeat, *minerals, in adequate levels and ratios can prevent or cure all the infectious diseases of the day.* You can take that to the bank.

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IN PART THREE, we will discuss simple but powerful mineral formulations, some really good sources of minerals, and easy methods for providing minerals to livestock.



## MINERALS: For Man and Beasts, and Plants Notwithstanding

Part 3

by William G. Winter, DVM

Once one determines that mineral supplementation is in order, which is what we do until we get our soils and forages fixed, the question arises “How do I get minerals in them?” Since it’s virtually unheard of for animals to over-consume minerals, even if given free-choice, we need to focus on delivery systems and palatability. I’ve had several ranchers call me, almost upset, saying “you told me my cattle showed signs of mineral deficiency and I went out and bought the minerals you recommended, but THEY WON’T EAT IT!” What does that mean? As we shall see, sometimes it’s as simple as “monkey see-monkey do”.

### YUM YUM, EAT ‘EM UP!

A few years ago two adrift sailors were rescued on Lake Superior after several days of being lost following a bad storm. They were suffering from acute *dehydration* in spite of being on the largest and most pure fresh water lake in the world! They didn’t drink the water because they thought it was salt water. Sometimes it can be like that with livestock, the minerals are there, but, as we have scientifically proven, they won’t work if they aren’t consumed.

If you have been following the work of KATHY VOTH in this magazine, and I hope you have, you will note that she discusses fully the art of using animal behavior science to overcome “neophobia” in animals, that is, the reluctance to try anything new. The common array of pasture “weeds” happen to be one of the least appreciated and least expensive sources of minerals on the farm, a story we will elucidate further in subsequent columns. The animal with the most neophobia, by the way, is a farmer! But that’s another story as well.

I’ve frequently recommended the livestock husbandry books by PAT COLEBY who also gives methods she uses in to introduce new concepts to livestock. She teaches how to basically override their natural instincts so that supplemental minerals will be gobbled up. Since her homeland Australia is so devoid of essential minerals she has become a leading world expert in managing mineral intake, I recommend her book “Natural Cattle Care”.

We also have to make sure that the MINERAL BOXES are convenient and accessible, and that the minerals are fresh, dry and tasty. In general the box should be hooded to prevent rain from entering, with a wind-vane to face it away from blowing rain or snow. Don’t use salt to “inhibit” over-consumption, keep that in another box. Mixing them actually punishes animals for trying to access the minerals they need. If you get creative with a welding torch and farm scrap metal, box-making can even turn into a cottage industry. The ideal grazer mineral box should be on wheels (or skids) so it can be moved around pastures to encourage even grazing and pasture wear. Make sure the box has

separate compartments. If you don't have oiler rags hanging over each bin you are missing an excellent opportunity to administer herbal fly repellants. You can see photographs of state-of-the-art mineral feeders on my website [www.willwinter.com](http://www.willwinter.com)

We also have some tricks to assure good mineral intake. For instance DYNA-MIN (see below) is a fine powder that when first introduced will not always be consumed, even in the presence of mineral starvation. Solution? We measure out the amount we want to have consumed, usually 4 oz/head/day and sprinkle it with something delicious like a good drizzle of MOLASSES. They lick it up like candy! Every day use less molasses and the rest is simple. When new stock or offspring see the elders eating, they will know it's safe and good.

## THE BASICS FOR EVERY GRAZIER'S TOOLBOX

These are simple mineral supplements that I've used to cure and prevent almost all the common livestock issues such as foot rot, pinkeye, mastitis, high somatic cell count, bovine TB, BSE, Johne's, shipping fever, and parasites. Hard to believe anything can be so simple, but it is.

1) A good TRACE MINERAL MIX. Almost all feed mills and farm coops have one and it's almost always best to find a local source. Try to match the CALCIUM to PHOSPHORUS ratio to that which your particular soil specifies, most are 2:1 ratios on down to 1:1. Buying local keeps transportation and shipping costs down. Some are better than others (most are pretty inadequate actually) and it might take time to get a reliable source and recipe. Both GEARLD FRY and JERRY BRUNETTI have time-tested recipes that I recommend and, for the Thousand Hills Cattle Company producers, we have found a great source. We always boost the IODINE, SELENIUM, COPPER, MANGANESE, MAGNESIUM and ZINC to the amounts I listed in part 2 of this series. E-mail me direct if you need a referral or if you have a good recommendation in your area.

2) KELP, Seaweed, if you will. As we've stated, many of our soil minerals have been leached or mined and have run off into the ocean. Bringing back good sea vegetables is an excellent way to get natural, chelated, organic minerals into the body in a form that is imminently digestible and assimilable. Iodine is one of the most important and most deficient minerals on every farm and kelp is loaded with it. Try to find a good source that is sustainably harvested and processed naturally. Most animals love kelp and it can be used to enhance other minerals. It's fine to mix kelp with the seasalt supplement 50:50.

3) SEASALT- I like to use a good brand like Redman's or others but be sure it's real sea or earth salt, not purified white salt. Keep seasalt readily available to all livestock year round. The usual intake will average around 2 oz/head/day.

4) DYNA-MIN (made by Agri-Dynamics) This ancient seabed clay deposit is mined in California and ground into an easy-to-use powder. It's a tasty combination of colloidal and ionic trace minerals for the production of essential amino acids, enzymes and tissue

cells. The clay also is a detoxicant (mold, heavy metals, pesticides) and it reduces parasites. It also makes a great buffer for acidosis problems. I couldn't do holistic herd health without a product like this. (should be accepted for organic but always check with YOUR certifier).

5) HEMO-CELL 100- (Agri-Dynamics) Everyone has the occasional weak animal, stress episode, emergency infectious disease outbreak or chronic nagging problem. This is where we need to have the appropriate remedial product on hand and ready to give. This is a mineral and vitamin concentrate but much more, with digestive bitters and enzymes, probiotics and other herbs and nutrients. When it comes to dry cows, this is like hiring a tutor for your slow student. Almost all mastitis organisms strike during the dry period so it's that period when special help is needed. Reproduction and lactation are stresses on the body and this is the soothing balm animals need. Shipped animals need Hemo-Cell 100 as do any animals that have broken or may break with pinkeye, foot rot or other infectious disease.

Remember that the unabsorbed portions of all these orally fed minerals will be naturally recycled back onto the pastures of the farm via manure. Since you no longer have need for pour-ons or toxic wormers like Ivomec, you will soon have DUNG BEETLES in every manure patty to assure an even and rapid spread of the minerals into the soil. Incidentally, I'm starting a brand new "Dating Service" to help introduce lonely dung beetles to healthy farms that need them. Call me.

## GETTING SERIOUS

Many producers such as DOUG GUNNINK have had success with the soluble mineral supplement SOLMIN which is an inexpensive additive for the water tank, check out his website [www.grassfedisbest.com](http://www.grassfedisbest.com) for more details. Top of the line grass-fed beef producers such as DAN COUGHLIN of Lonsdale, MN have also had amazing results adding a trace amount of COPPER SULFATE directly to the water tank, especially for the cow herd, and it only requires addition on about every 3rd tank. This also keeps the tank clean. For details on that contact [www.thousandhillscattleco.com](http://www.thousandhillscattleco.com).

GEARLD FRY at [www.bakewellrepro.com](http://www.bakewellrepro.com) has more information on how to interpret a mineral bag tag, how to convert milligrams to per cent to parts per million and back and forth. He can explain minerals for reproduction down to a gnat's behind.

JERRY BRUNETTI cut his teeth on dairy nutrition where minute deficiencies can lead to total farm collapse syndrome. Over the last 30 years he has developed an entire line of organic products that are designed to fill every gap in the production cycle. Contact him at [www.agri-dynamics.com](http://www.agri-dynamics.com) to inspect the new website and get their catalog, an unusual publication that includes great amounts of free information.

There are many other good suppliers of information and products. The ones I've listed here are the ones that I have used and that I know to work. We are in an evolving new arena of intensive grazing and grass-based production so I always appreciate hot tips and testimonials. Check out the Stockman Grassfarmer advertisers and exhibitors at grazier events and try to overcome a tiny bit of your well-earned farmer neophobia!

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William G. Winter, DVM is a free-lance journalist and teacher. He is primarily interested in awakening the world to the human health benefits and the environmental bonus that comes from raising 100% grass-fed livestock, particularly those who are using sustainable practices and the magic of holistic herd health. He is also the herd health consultant for producers of livestock for Thousand Hills Cattle Company and lives in Minnesota where the grass grows green and lush, and all the producers children eat right and are therefore above average. Contact him with your concerns, grand concepts, and rave compliments at [holistic@visi.com](mailto:holistic@visi.com) or [www.willwinter.com](http://www.willwinter.com).