

Proper Mineralization of Beef Cattle for Optimal Health, Performance and Profit:

By: Bill Roberts

Cattle are amazing animals. They are designed by their Creator to consume an abundant regenerative resource, green growing grass and other herbs. Cattle consume these fibrous green growing plants which are generally of little use to mankind as a primary food source, and turn it in to a delicious and nutritious food. In the proper growing environment, the meat is rich in protein, high energy essential fats, vitamins, enzymes, phytonutrients, and a wide array of life-giving minerals.

History records that beef has long been acclaimed for its protein benefit. Recent nutritional science has revealed vistas of understanding about the health-giving value of beef's essential fatty acids. However, this discourse will focus on the phenomenal benefit of colloidal minerals available to mankind through consumption of beef and how to assure that value is maximized.

Linus Pauling was a nutritional scientist who received the Nobel Prize for his work twice, the only man to ever do so. He summed up the value of proper mineralization for human health in this statement, "You can trace every disease and every infection to a mineral deficiency from unequally yoked energy fields." Meditate on that statement for a minute or two and the impact is monumental. The economy of our nation and world are being rocked by the declining health of its people. If Dr. Pauling's statement is true, perhaps we ought to be addressing the reasons for ill-health more than financing a band-aid to cover the costs of ill-health.

There are 109 elements listed on our Scientific Chart of Known Elements. 92 of those are minerals. It is worth noting that in the total composition of a beef animal, all 92 are present. This presents beef as a tremendous source of minerals for mankind for two reasons:

- 1) The total complement of different minerals in the beef**
- 2) The bio-available form that they are in**

The total complement is important when one considers that most vegetable and fruits in nature generally contain 16 major minerals and only 30 to 40 total minerals when trace minerals are included. Grasses are unique in that they include all 92 known minerals. Is it not interesting and significant that

the very food stuff designated by the Creator as intended for cattle (the green growing herb), there are all 92 minerals present? Cattle consume that mineral enriched fibrous feed and convert it to a delicious and palatable food for man full of those same minerals.

Bio-availability is also a significant factor for mineral rich beef. Minerals occur in three forms in nature. Minerals in their pure form are called Elemental Forms. They are only 2 to 5 % digestible and absorbed by man. Chelated minerals are bound in a complex, usually with a protein, that is as much as 35 % digestible and absorbed. Colloidal minerals are those that have been incorporated in to a biological form in plant or animal tissue that is as high as 98 % digestible and absorbed by man. Properly fed beef has the preferred colloidal minerals for mankind. As noted previously, cattle that are raised on the green growing herb in an unrestricted environment as nature intended have a full complement of minerals available to them and therefore can yield a full complement to the people who consume that meat. This is one of the many distinctions of grass fed and grass finished beef over conventional grain feeding of cattle. Logic would dictate that the array and quantity of minerals have to be available to the cattle to be in the meat.

Beef cattle have been domesticated for service to mankind since Biblical times. Herdsman the world over have tended their herds primarily in a free-ranging management system that allowed the cattle's access to a diversity of grasses, legumes, forbs and other green growing herbs. That diverse smorgasbord diet was as nature intended for a complete diet and especially mineralization. It is pivotal in our understanding to realize that soils and plants vary in their mineral composition. Free range grazing environments like the buffalo utilized in North America, allow ruminants to cover much ground and seek out nutrients that their instincts recognize through, sight, smell, taste, and internal bio-feedback once ingested. These instincts are partially learned from their parents and herd mates, and partially intrinsic functions designed in nature to allow discernment on what is good and what is not. The roaming ruminants derived minerals not only for the variety of plants they consume, but from natural salt licks and from eating soils with varying mineral profiles. The unrestricted environment provides a wide variety of mineral sources for nutritional completeness.

Dr. William A Albrecht was a soil scientist from the University of Missouri whose work has done much to reveal the secrets of soil fertility and mineralization as it impacts animal health and human health. His work is a

wealth of insight in how free ranging ruminants like cattle and buffalo prospered in a free ranging state but suffered when restricted in their movement by man's management techniques and abuse of soils. Dr. Albrecht observed that buffalo covered certain areas in their migrations and stayed away from other areas. His soil surveys revealed that the buffalo wandered about in search of high quality soils that produced nutrient dense forage where their cravings were appeased and stayed away from areas where their cravings were not appeased due to poor quality soils. He learned that ruminants left to their own devices will seek out the nutrition they need. He also learned vividly that all soils are not created equal. The buffalo grazed on soils with high organic matter content in the top soil. These findings are imperative to understanding the need for mineralization in poor soils and restricted grazing environments. They also are the basis for understanding that a cafeteria mineral supplement program will allow the opportunity to have cattle use their "natural selection instincts" to balance their mineral diet if the choice to do so is present.

It is critical to understand that minerals in the soil come in three forms: rock, clay and water soluble minerals. Only the water soluble forms of minerals are available to plants. In order for rock or clay to be converted to water soluble forms of minerals, they need to be acted on by the multitude of biological workers in the soil like bacteria, fungi, protozoa, nematodes, arthropods, earthworms, and the plants roots themselves. In a pristine environment over time, microbial action on rock and clay coupled with plant residues result in soils increasing in nutrients. However, when man abuses land, the microbial life and its ability to increase soil fertility decrease. These abuses include overgrazing, erosion from wind and water, poor tillage practices, toxic chemicals and salt fertilizers, leaching, burning, etc.. Where soil biology has been limited, so is the nutrient capacity of the soil and forage. One could track the migration of buffalo by the high biology content soils. It is important to note that most agricultural soils in the US today are far below the 6 to 10 percent organic matter characteristic of much of our soils when the white man arrived. Today many of our agricultural soils are below 2 % organic matter. We expect our cattle to graze and be healthy and happy on soils any self-respecting buffalo would avoid.

Another key concept from Dr. Albrecht was that minerals ingested by cattle and buffalo often need to be in a specific ratio one to another. He developed a graphic "mineral wheel" that showed inter-relationships of certain minerals one toward another. Certain minerals need to be present to allow metabolism

of other minerals. Likewise, excess of certain minerals can cause a deficiency of others. These unique inter-relationships illuminate the need by and the ability of the ruminant to pick and choose mineral enriched forage that complements other aspects of their diet. By "intelligent choice," they arrive at a balance for dietary harmony and completeness. In today's methods of restricted management of livestock, an option to balance mineral intake has been taken away. The exponential increased demand for pharmaceuticals as crutches to prop up animal health exactly parallels US farmers and ranchers increased restriction of beef cattle's grazing environment and/or feeding system. Man has attempted to supplement this problem with free choice mineral mixes that include his best estimate of what the cattle need to complement their incomplete diet. The very fact that disease incidence is still as high as it is, tells us that these attempts have room for improvement.

Tremendous inroads have been made in the last few decades on natural soil amendments and management to build soil fertility. It is available today to restore worn out soils to a high level of organic matter and the resultant soil fertility for mineralization in cattle. Unfortunately, these practices have not been universally implemented primarily due to man's propensity to remain uneducated and/or to avoid change. Until the time that restored soil fertility and forage diversity returns as the standard for grazing systems, there is a solution originated by Dr. Albrecht. He initiated a cafeteria system for mineralizing cattle. The system involves providing many choices of different minerals and vitamins to allow cattle in a restricted environment the opportunity to seek out the minerals they are lacking to balance that which they are getting in their available forage source. It is a proven system that has been successful since the early 1940's.

Mineralization in conventional beef cattle production systems in the US since WWII have centered on supplementation through a blended mineral containing all the major minerals deemed as necessary in a beef animals diet. Dr. Albrecht's work depicts this "all-in-one" mineral system as inferior to the cafeteria system where individual options allow the animal to balance their mineral intake as previously explained.

Until recent history, most minerals used in livestock were simply ground up rocks and provided poorly absorbed elemental minerals. About 40 years ago, chelated minerals became popular. Blended minerals are often made up of more absorbable chelated forms. Today, the premier mineral programs often use enzymes, liquors and yeasts to make a more highly bio-available form of

specific minerals. Those blended minerals were most often made up in a "one-mix-fits-all-environments" format. There was not adjustment for different soil profiles region to region, farm to farm. A cattleman usually was on a trial and error process to find out what particular mineral worked for their particular farm. The more progressive mineral manufacturers would take soil samples and/or forage samples and make up an all-in-one mineral to more accurately meet the needs of cattle on a given farm or ranch. Even that method falls short, recognizing that there can be quite a variation in soil mineral profiles field to field and pasture to pasture on any given ranch. Plus, none of these systems take in to account the seasonal increased needs for certain minerals due to environmental factors (i.e. increased need for sulfur every time the cattle change hair coats, the increased need for magnesium during the spring and fall lush periods, etc. etc.).

The premier format to assure proper mineralization for today's beef cattle is the cafeteria system that allows the animal to choose that which it needs to complement its dietary intake. Unless an unrestricted free range grazing system is available, this most closely resembles that kind of environment. It still does not preclude the need to develop pasture soils to their highest potential and to provide a diversity of grasses, legumes, forbs, and palatable shrubs to complement a beef animal's diet. It is merely a supplemental aid until a large extremely high quality forage grazing system is achieved. The right grazing system with the right forages on the right soils should minimize or exclude the need for any mineral supplementation. Until that optimum is achieved, cattle operations ought to consider the cafeteria mineral system. It is designed to maximize:

- 1) Animal health and animal performance
- 2) The nutritional benefits to humans who eat the nutrient dense and nutritionally complete meat
- 3) Profitability via optimal production performance of the cattle and when optimal nutritional value are realized by the consuming public

The old adage that "something cannot give up what it does not possess" applies to soils, the plants grown on those soils, and the meat from animals that graze those plants - truly all agricultural production. The cafeteria mineral program is an excellent complement to a livestock grazing program that wants to be sure animals have the choices necessary for their personal health and the health of those on down the food chain.