

MEDICINE AND MANAGEMENT

By CARL TROOP, VMD



Minerals are essential to life

Animals, while amazing creatures in their ability to convert grass and grain into meat, milk, and eggs, are by no means as versatile as the green plants themselves. In other words, the chemical substances required by animals to adequately nourish them are much more numerous and generally more complex than those needed by plants. Let us simplify these groups of substances and call them "food factors," that is the simplest chemical substances which will adequately nourish an animal.

Last column we discussed one of the most important food factors, protein; it being made up of the elements carbon, hydrogen, oxygen, some sulfur, and most importantly, nitrogen. These elements, except nitrogen and sulfur are also supplied by carbohydrates, fats, and water of the diet. The remaining elements necessary to life are usually thought of nutritionally as minerals. They are different from other food factors in that they are available to the animal when ingested as the element itself, and not combined with other elements to make more complex compounds.

Minerals are essential to life, but it is also essential to have them in a proper balance. Overfeeding minerals can have as bad an effect as a ration that is deficient. An imbalance can have a marked effect on the health of the animals. Mineral mixtures should not be fed indiscriminately.

Lets take the dairy cow for example. Minerals make up about 5 per cent of a cow's weight. Milk produced by that cow contains about .8 per cent minerals. A cow producing 15,000 pounds of milk a year will secrete about 120 pounds of minerals into the milk, plus what she needs for growth if not mature, maintenance, and development of the unborn calf.

If maximum production is to be obtained, mineral supplementation is very important. A large part of the needs can be supplied by forages and grains. Additional minerals can be supplied with simple mineral supplements. There are no "special additives" or "secret ingredients" claimed by some companies at great expense to the farmer. There are only so many essential minerals (both major and trace minerals) and these should be available in low cost simple mineral supplements.

Lowered production and toxicity can result from low quality or improperly formulated minerals or even from misuse of good minerals. The major feed suppliers are usually the best source of well formulated mineral mixes with sufficient testing behind them to have proven dependable.

The mineral elements required by dairy cattle are calcium, phosphorus, magnesium, potassium, sodium, chloride, sulfur, iodine, iron, copper, molybdenum, cobalt, manganese, zinc, and selenium.

Salt is one of the most important, containing sodium and chlorine. Most common dairy feeds have a very low salt content and should be supplemented. A half to one per cent salt in the concentrate or grain mix will supplement the needs of a producing dairy cow. Salt toxicity can result

from overconsumption if fed free choice, but is usually not a problem if adequate water is available.

Calcium, phosphorus, and vitamin D are involved together in bone and tooth formation, synthesis of milk and normal reproduction. The utilization of calcium and phosphorus depends on the level of each, the ratio between the two and an adequate supply of Vitamin D. An imbalance of the two minerals and vitamin D usually results in milk fever at calving time and rebreeding problems later. Calcium to phosphorus ratios of 1.5:1 or 2:1 are necessary to maintain proper balance. Phosphorus deficiency is probably the second most common deficiency in cattle, next to a lack of total feed. Phosphorus deficiency will be even more greatly aggravated when an over-abundance of calcium is fed. Calcium deficiency as such is not commonly observed in cattle. It usually occurs when too little roughage is fed. A good source of calcium is green, leafy legume hay and pasture. Good sources of phosphorus are oil meals. Grains are poor calcium sources, intermediate in phosphorus.

Magnesium is closely associated with calcium and phosphorus in body metabolism. Deficiency results in what is called "grass tetany" or "winter tetany" in cows. A level of .2 per cent magnesium figured on a complete dry matter basis is usually adequate.

Potassium is likely to be deficient when high levels of concentrates are fed. Suggested levels of potassium are about 1 per cent, again figured on a complete dry matter basis.

Sulfur is essential for certain proteins, and when high protein roughages and natural protein supplements are fed, sulfur deficiency is rarely a problem. But when heavy corn silage or urea diets are fed, sulfur can become critical, as you are substituting natural sulfur containing protein with sulfur free non protein nitrogen. Suggested level is .2 per cent of ration dry matter.

The only known function of iodine is formation of a compound in the thyroid gland which helps control animals metabolism. Very minute amounts of iodine in the ration are necessary, and an overabundance can be provided if a trace mineral premix plus a trace amount of salt is fed, plus iodine containing compounds to aid in rot and lumpy jaw control. One source of iodine is adequate.

Iron, copper and molybdenum are also required in minute amounts. In adult cattle under usual management and feeding conditions deficiencies do not often occur. Calves restricted to an all milk diet iron deficiency can result in anemia and poor growth.

Manganese requirements are low but suggested requirements range from 20-100 PPM (parts per million). Common rations usually supply sufficient manganese. Manganese is known to have many functions, and to ensure against deficiency it is usually included in most mineral mixtures.

Cobalt is required for proper functioning of rumen micro-organisms as they use cobalt to synthesize vitamin B12 which is required in their growth and multiplication. Vitamin B12 in turn is required for blood formation. Legume hays are good sources of cobalt, grass hays 10 PPM is adequate.

Zinc is essential for normal skin condition and wound healing. 40-80 PPM is adequate.

Last of the minerals is selenium, probably the mineral about which the least is known at the present time, also the most research being conducted. Deficiency of selenium has been suggested for many problems including twisted stomachs to retained afterbirth. Much work is being done at the present time on its importance in disease conditions in many species of animals and its relationship with vitamin E. It is a vital but also a poisonous trace element. Selenium is being pushed, fortunately, as an illegal feed supplement in some areas. It can be very toxic and should be used only with professional consultation. Only one tenth part per million in the diet will safely prevent selenium deficiency in animals. Toxicity or poisoning can occur at only five parts per million. Where selenium deficiency is known or suspected of existing, intramuscular injections of selenium supervised by your veterinarian is recommended by Penn State and found to be quite satisfactory. Selenium cannot legally be added to cattle rations and is strongly discouraged, except on a prescription basis.



In the early 1900s Anton Haislan spent 22 months with his wife and daughter in a carriage a total of 15,000 through the streets of Paris.



It's the season for barbecuing chicken - an American tradition that's gaining popularity around the world. In Spain, for instance, the National Broiler Council reports that there are little shops serving nothing but barbecued chicken, and that they're as popular in some Spanish cities as pizza parlors are in the United States.

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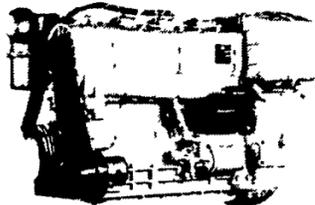


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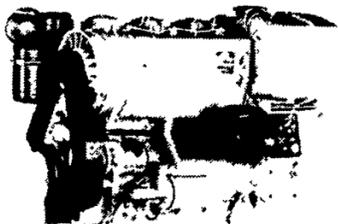
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