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UCD VET VIEWS
CALIFORNIA CATTLEMAN, NOVEMBER 1998

TRACE MINERALS FOR CATTLE: AN UPDATE

Many of you are finished with weaning calves, shipping yearlings, or completing other Fall work, hopefully, before winter arrives. It is a natural time to reflect on the successes of the year and also the less successful aspects with an eye toward making improvements for next year. Cattle prices have been down for longer than anyone predicted and hopefully, there will be an upturn in the months to come. Methods to maximize cattle health and production should be reviewed just in case prices do improve. One of the areas commonly found to limit health and production in California is trace mineral nutrition. Trace minerals are those mineral nutrients that cattle need in very small or trace amounts—usually less than one one-hundredth of an ounce per day. Small amounts of these minerals are very necessary (or essential) to cattle health and production. We usually talk in terms of parts per million (ppm) of the diet or in milligrams (mg) per day. For a point of reference, one (1) ppm is about one inch in 17 miles. If not supplied in the diet or in supplements, significant losses can occur. While only trace amounts are needed, deficiencies can be devastating to the cattle and to the operation. This month, we will discuss three trace minerals that are commonly deficient in California beef cattle and some of the newer information for each.

Copper

Symptoms: Common symptoms of copper deficiency in cattle include: chronic diarrhea, weight loss, poor weight gains in calves, sudden death in adult cattle, swollen joints, broken bones (ribs and legs), light hair coat (gray in Angus, yellow in Herefords), and increased susceptibility to disease.

Diagnosis: The best tissue for diagnosis of copper deficiency in cattle is the liver. In the last two years, many veterinarians in California have attended advanced training sessions on liver biopsy techniques in cattle. University of California Extension Veterinarians have designed a new liver biopsy instrument that is very practical for chuteside use. These diagnostic tools are widely available to the ranchers of this state. The use of serum (separated blood) samples can also be of valuable in screening herds for severe copper deficiency. If symptoms compatible with copper deficiency are observed, consult with your veterinarian and have he/she take the appropriate samples to determine the copper status of the herd. **DO NOT** start increased copper supplementation without an accurate diagnosis and a plan for follow-up testing. Copper has the smallest margin of error of any of the trace minerals. Currently, there are several dairy herds in California that have been over supplemented with copper and losses have been severe.

Treatment and Prevention: Many veterinarians in California prescribe and have compounded copper injections (copper glycinate) for their clients. These products are given subcutaneously and provide adequate supplementation for 6 to 12 months. Caution must be used when these products are given, as serious side effects can occur. Follow your veterinarian's advice carefully when using copper injections to avoid problems. Also available are slow release boluses that supply copper to cattle for a full 12 months. These products are now available through your veterinarian and come in two dosage sizes, 12.5 gram and 25 gram boluses. Copper can also be added to molasses mixtures, loose salt mixes and a variety of other supplements. Avoid relying on salt blocks to provide adequate copper supplementation.

Iodine

Symptoms: Goiter, weak calves, and an increased number of cases of foot rot, lumpy jaw, and woody tongue in cattle.

Diagnosis: Serum samples can be useful for diagnosis of iodine deficiency; however, most of the time the diagnosis is made on the basis of symptoms. **Treatment and Prevention:** Iodine is usually added to supplements that contain other materials (trace minerals, energy sources [molasses], protein supplements). Stable iodine compounds can be added to loose salt mineral mixes. Salt blocks are not a reliable source of iodine supplementation. The iodine compounds in the blocks are much more soluble (dissolve in water more readily) than the salt (sodium chloride) and move through to the bottom of the block before the cattle can "catch up to them" and ingest the iodine. The same problem occurs to a lesser degree with copper compounds and selenium compounds in salt blocks. My recommendation is: "do not to rely on salt blocks" to supply any meaningful amounts of trace minerals.

Selenium

Symptoms: Common symptoms of selenium deficiency include: white muscle disease in calves, abortions, infertility, retained placenta (afterbirth), chronic diarrhea, weight loss, poor weight gains (ill thrift), and decreased immune function (increased susceptibility to disease, decrease response to vaccines).

Diagnosis: Diagnosis is very simple in California, with the current diagnostic laboratory system (CVDLS). A blood sample submitted by your veterinarian to the diagnostic laboratory will quickly and cheaply determine the selenium status of the herd or animal in question. Serum samples are not appropriate samples for determining selenium status, however.

Treatment and Prevention: Selenium injections (Mu-Se®, Bo-Se®) have been used for some time to treat white muscle disease or other selenium deficiency syndromes. The injections provide selenium supplementation very rapidly and are very effective for therapy. However, they provide only partial supplementation for 28 to 45 days. Thus, if injectable selenium is the sole means of supplementation, injections would have to be repeated 8 to 12 times per year. Selenium added to salt mineral mixes at concentrations up to 120 ppm can be very effective at maintaining adequate selenium in the cattle. Consumption of the salt mixes at about one ounce per head per day will provide 3 mg selenium per day, which is the legal limit. Selenium can also be added to molasses products and other supplements. Again, the maximum legal amount is 3 mg selenium per animal per day. As with iodine and copper, I do not recommend salt blocks as a reliable means of supplementing selenium or other trace minerals to cattle. Selenium boluses that release no more than 3 mg per day are currently legal; however, no products are currently available. Selenium boluses or other forms of selenium supplementation may become available over the next few years.

Your veterinarian can be a great source of information regarding trace mineral nutrition for your beef herd. The new diagnostic methods, new products, and new information from research trials are very helpful for making decisions regarding these trace minerals that are so important in California.

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