Texas Dairy Matters
Higher Education Supporting the Industry

MINERALS: SMALL AMOUNTS, MAJOR IMPACT

Kevin Lager, Todd Bilby, Ralph Bruno, and Ellen Jordan
Extension Dairy Team
Department of Animal Science
Texas A&M AgriLife Extension Service
The Texas A&M University System

Minerals comprise a small percentage of the diet, but can have devastating consequences if removed or supplied at inadequate levels in the ration. The major minerals, macro-minerals, required by the cow include: calcium, phosphorus, magnesium, potassium, sodium, chlorine and sulfur. Micro-minerals, required in smaller quantities, include: iodine, iron, cobalt, copper, manganese, zinc and selenium.

Forages and concentrates provide a substantial portion of the mineral requirement. However, supplemental mineral sources are required due to insufficient levels provided by the dietary ingredients and the variability in bioavailability of minerals from forages and concentrates.

Dietary components should be tested for mineral content using approved methods of analysis. Wet chemistry analysis accurately measures mineral content for a greater number of minerals, followed by inductively coupled plasma (ICP) and near infrared reflectance spectroscopy (NIR). Samples analyzed by ICP and NIR are checked against samples analyzed through wet chemistry methods.

The question is often asked “Is there an ideal time to eliminate or reduce mineral supplementation, and if so, what stage of lactation allows for this adjustment?”

- In early-to-peak lactation, the cow is depleting body stores of calcium and phosphorus and is at her greatest need for adequate mineral levels due to the body’s inability to store

large quantities of available minerals. Selenium and zinc promote cow health during a time when the body is recovering from calving, maintaining a high level of production, and also preparing reproductively for pregnancy. Minerals, such as sulfur, copper and cobalt, promote intestinal health to assist with digestion of the large amount of feed being consumed that eventually becomes milk.

- In mid-to-late lactation, the cow is still producing milk, but is also replenishing body mineral stores utilized in early-to-peak lactation to prepare for when she must utilize those stores at and following her next calving. In addition, during late lactation the cow must be able to support a growing fetus.

- The dry period is also a critical time for adequate mineral supply, since calf development is at its greatest during the later months of gestation. Improper nutrition in the dam during fetal development can significantly affect the health of the unborn calf.

Thus the answer is really "NO" there isn't an ideal time.

Effects of inadequate mineral levels may not be realized for months after ration adjustments. These effects may surface as lameness issues, since a weak point in hoof development may take three months or longer to materialize when the hoof grows enough to display lameness. Reproduction may suffer as well, with inadequate mineral supply leading to greater days in milk before conception and increased breeding costs associated with increases in the number of services per conception and drug costs for synchronization.

Tight economic times provide an incentive to improve efficiency. Test for mineral content of dietary components and formulate rations to supply adequate mineral levels based on cow production. Reduce mineral supplementation only if the mineral content of the dietary components, based upon the lab test, will support production. Continue to work with a nutritionist to find the proper balance. Cutting corners when "times are tough" may very well cut into profits down the road.