



## **Importance of Copper for Fertility and Health**

By Jackie Nix

### **Copper Deficiency a Common Problem**

Marginal to severe copper deficiency in goats is widespread across the United States. Typical deficiency symptoms include: rough, discolored hair coats (faded color around the eyes, red tinge on black hair, etc.); winter coats that are slow to shed; decreased conception rates; increased days open; hoof problems; depressed immunity; anemia; reduced growth rate and, in some cases, diarrhea. Copper deficiency in goats is brought on by a combination of factors including: low soil copper levels, high soil concentrations of antagonistic minerals and plant effects.

Forage surveys conducted across the United States overwhelmingly reveal forage samples that are marginally to severely deficient in copper. Additionally, a high number of samples contain levels of antagonistic minerals (sulfur, molybdenum and iron) high enough to induce copper deficiency. These antagonistic minerals bind with copper making it unavailable for use by the goats. Excessively high levels of these minerals will increase copper requirements in goats. In other words, when these antagonistic minerals are excessive goats will need more copper in order to meet their nutritional needs.

Copper levels in forages are not only dependent on mineral levels in soils but also the forage type and maturity. Grasses tend to be lower in copper than legumes grown under the same conditions. Also, copper concentrations are higher in leaves compared to stems. Therefore, as a plant becomes more mature (stemmy) its value as a copper source decreases. For all of the above reasons, it is important to provide supplemental copper to goats.

### **Why is Copper so Important?**

Copper is needed by a variety of key systems in the body. Numerous enzymes necessary for reproduction, immunity and growth need copper. In addition, copper is necessary for proper metabolism of iron, maintenance of connective tissue, pigmentation of skin and hair, maturation of hoof tissue, and many other functions.

### **Copper and Immunity**

Proper copper nutrition is essential for a healthy immune system in goats. Copper is needed for proper development of antibodies and white blood cells in addition to antioxidant enzyme production. Copper deficient goats are more susceptible to infections and do not respond as well to vaccinations. In addition, they tend to be less resistant to parasitic challenge. Goats receiving proper copper nutrition tend to be less susceptible to infections and have less severe infections when disease does occur.

## **Copper and Reproduction**

It is widely known that copper deficiency results in reduced reproductive efficiency and performance. It is theorized that low copper levels alter enzyme systems involved in reproduction. Typical copper deficiency symptoms include decreased conception rates, increased days open and delayed puberty and decreased libido and semen quality in bucks.

Proper copper nutrition in pregnant females is critical to the health of newborn kids. Newborns are very dependent on copper acquired during the prenatal period since milk is a poor source of copper. Kids have a high copper demand during the first few months of life. Additionally, copper status in the dam is critical to the production of high quality colostrum. Colostrum provides passive immunity for the kids until their own immune systems develop fully. Also, copper nutrition has been shown to be an important component in a newborn's ability to withstand cold stress. Kids born to copper deficient dams experience increased death losses, reduced growth, reduced immunity and poor production efficiency.

## **Copper and Stress**

Stress increases an animal's mineral needs and tends to exacerbate existing mineral deficiencies. This is especially important during weaning. Studies have shown that copper deficient calves have more health problems, gain weight less efficiently and have lower net returns. These same principles apply to goats. Therefore, it is vital that goats receive adequate mineral nutrition BEFORE weaning because even a proper mineral program cannot overcome existing mineral deficiencies once stress sets in. Market kids will perform better when they have received adequate copper nutrition prior to weaning.

## **How Can I Provide Enough Copper for My Goats?**

The key in providing adequate copper is to provide YEAR-ROUND access to a free choice mineral supplement that contains sufficient copper. The amount that is sufficient will vary according to current mineral status of your goats, soil mineral levels, season, etc. Do not skimp on mineral supplementation during spring and summer months when forage quality is good. Remember that most soils are deficient in copper so the forages grown on those soils will be deficient too. Keep track of mineral consumption. Supplements do your goats no good if they are not consumed at recommended levels. It is also important to eliminate use of yellow sulfur salt blocks. These sulfur blocks can artificially increase sulfur levels to the point of inducing copper deficiency in your goats.

Sweetlix offers a complete meat goat mineral called the **16:8 Meat Maker™ Mineral**, a complete dairy goat mineral called **Caprine Magnum-Milk** and a protein block called the **20% All Natural Goat Block**. These supplements provide recommended levels of copper supplementation. Sweetlix supplement products for goats help goats attain maximum performance by providing complete vitamin and trace mineral supplementation designed especially for the nutritional needs of goats. All of these products will deliver 100% of the daily trace mineral needs of goats, including copper, selenium and zinc when fed according to label directions. Ask for Sweetlix by name at your local Sweetlix dealer or call 1-800-325-1486 to learn more about Sweetlix supplement products for goats.

*Jackie Nix is a nutritionist with Sweetlix (<http://www.sweetlix.com>). You can contact her at [jnix@sweetlix.com](mailto:jnix@sweetlix.com) or 1-800-325-1486 for questions or to learn more about the Sweetlix line of mineral and protein supplements for goats, cattle, horses, sheep and wildlife.*