Dairy Guidelines

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Minerals and Vitamins for Dairy Cattle

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Dairy cattle need minerals and vitamins. There is considerable misunderstanding about which minerals and vitamins are needed, how much to feed, and methods of feeding. Under most Virginia feeding conditions, the following amounts will supply adequate quantities of those that should be added to the grain mixture:

SALT (TRACE MINERALIZED)[1] - 20 LBS. PER TON
CALCIUM-PHOSPHORUS MIXTURE[2] - 40 LBS. PER TON
VITAMIN A - 6 MILLION I.U. PER TON[3]
VITAMIN D - 8 MILLION I.U. PER TON[3]

[1]The trace mineral content should contain copper (0.15%) and cobalt (0.015%) in addition to other trace minerals.

[2]Either dicalcium phosphate, defluorinated rock phosphate, or steamed bone meal may be used. See discussion on Ca:P ratio.

[3]The final grain mixture should contain 3,000 I.U. of Vitamin A and 4,000 I.U. of Vitamin D per pound.

The best way to feed minerals and vitamins is to add them to the grain mixture. Thus, with grain being fed according to the amount of milk being produced by the cow, adequate quantities of minerals and vitamins will be supplied. However, parlor-fed cows often do not have time for adequate concentrate intakes. To meet the animal needs for minerals, free choice consumption of a mixture of 40% trace mineralized salt and 60% calcium-phosphorus source should also be permitted.

ISSUED IN FURTHERANCE OF COOPERATIVE EXTENSION WORK, ACTS OF MAY 8 AND JUNE 30, 1914, IN COOPERATION WITH THE U. S. DEPARTMENT OF AGRICULTURE. W. E. SKELTON, DIRECTOR OF EXTENSION SERVICE, VIRGINIA POLYTECHNIC INSTITUTE, BLACKSBURG, VIRGINIA 24061.

Minerals:

Minerals have many vital functions in the body. Besides building bones, they play an important role in all soft tissue, aid in digestion and assimilation of food, and supply minerals for milk. Most of the trace minerals, which are needed in very small amounts, are supplied in a normal ration. However calcium, phosphorus, sodium, and chlorine (salt) are needed in larger quantities and should be added to the ration.

Only during the last few years has the importance of calcium (Ca) to phosphorus (P) ratio been recognized for dairy cattle. Many studies clearly show that an imbalance of Ca to P is a major contributing factor to milk fever. Therefore, it is suggested that the Ca:P ratio in dairy cattle rations be maintained between 2:1 and 1:1.

When large amounts of corn silage are fed, adding 2% dicalcium phosphate, defluorinated rock phosphate, or steamed bone meal to the grain mixture will furnish sufficient Ca and P to give this ratio. But, if large amounts of legume hays are fed, little, if any calcium supplementation is needed. A phosphorus supplement such as monosodium phosphate should be fed. Limestone should be used sparingly in dairy cattle rations because it supplies only Ca and can result in an imbalance of Ca:P.

Vitamins:

Vitamins are essential for life and normal body function. Many vitamins are known, but A and D are of major concern to dairymen. All the B-Complex vitamins including Biotin, Choline, Niacin, Pantothenic acid, Pyridoxine, Riboflavin, Thiamin, and B_{12} are synthesized in the rumen of the cow and need not be fed in the ration. Vitamin C is not required by cattle, and E and K are supplied in normal feedstuffs.

Because of the decrease in the amount of grasses and legumes fed to dairy cows and the increase in corn silage and concentrates, natural rations usually furnish considerably less Vitamins A and D than previously. Furthermore, higher milk yields increase the requirement of these vitamins. It has also been suggested that high levels of nitrate in forages (resulting from heavy nitrogen fertilization and various other factors) interfere with Vitamin A utilization. However, the evidence supporting this idea is still controversial.

Therefore, as cheap insurance against possible deficiencies, it is suggested the concentrate be fortified with Vitamins A and D so a cow can obtain her daily needs from the concentrate consumed. To achieve this, it is recommended that concentrate contain 3,000 I.U. of Vitamin A and 4,000 I.U. of Vitamin D per pound.