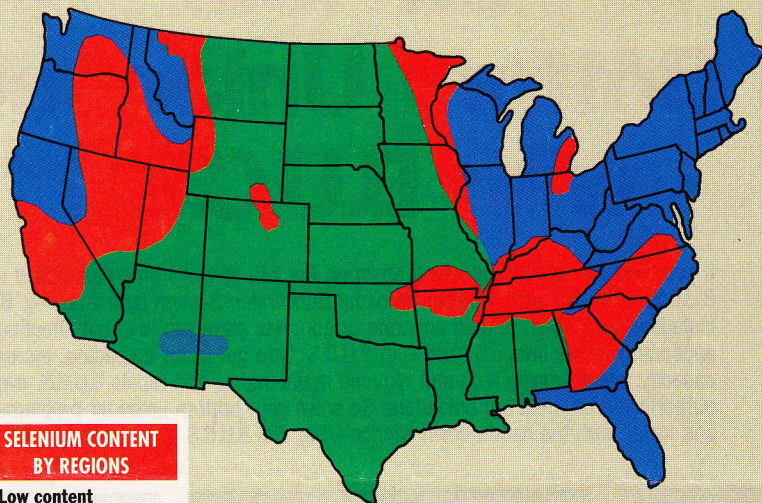


WHEN'S AND HOW'S OF ADDING SELENIUM



SELENIUM CONTENT BY REGIONS

Low content

About 80 percent of all forage and grain contain less a 0.1 ppm selenium.

Variable content

About 50 percent of the crops contain more than 0.1 ppm of selenium.

Adequate content*

More than 80 percent have more than 0.1 ppm selenium.

* This map is not completely accurate because areas with 0.1 ppm selenium are still below the recommended 0.3 ppm level. So, the areas designated as adequate might still be deficient.

After Sept. 13, you can still give your cows the selenium they need — through alternative, more costly methods.

A year ago, the Food and Drug Administration decreased the legal limit of supplemental, inorganic selenium from 0.3 parts per million to 0.1 ppm. The law will be enforced this fall. However, research shows that cattle in selenium-deficient areas need 0.3 ppm to enhance their immune response system and fight naturally-occurring diseases.

To decide if you need to supplement selenium, first determine if you live in a selenium-deficient area. The map above shows the geographical breakdown of selenium areas in the United States.

Next, evaluate the frequency of retained placentas that occur on your farm.

Not every retained placenta is caused by a selenium deficiency, says Bill Weiss, dairy nutritionist at Ohio State University. But if retained placentas in the herd increase, take blood samples and check selenium status.

One week before or after calving, take blood samples of at least three to four cows. Either test for selenium in plasma, which measures short-term selenium status, or selenium in whole blood, which measures long-term selenium status.

Ask your veterinarian or extension agent for your nearest lab. Schering-Plough Animal Health will run whole blood tests for \$6 a sample, with a minimum of five samples. The following table shows recommended concentrations for both kinds of tests:

Selenium level	Plasm, microgram/ml	Whole Blood, microgram/ml
Adequate	>.075	>.20
Marginal	.05 to .075	.15 to .20
Deficient	<.05	<.15

Source: Bill Weiss, 1994 Tri-State Nutrition Conference

Depending on your circumstances, you have three options for adding selenium:

■ Supplement the feed by the legal limit of 0.1 ppm. Producers should feed this amount, regardless of the cows' blood levels, to prevent extreme deficiencies, Weiss says.

■ To raise the level to 0.3 ppm, feed grains or forages naturally high in selenium. For example, brewers grains and linseed meal are naturally high in selenium, as are barley and alfalfa grown in selenium-sufficient areas.

■ Give selenium injections. Weiss recommends 50 milligrams about 3 weeks before calving. Injections must be given in conjunction with feed supplementation. Injections are legal because they fall under a different type of regulation. MuSe® from Schering-Plough is the only injectable approved for use in the United States; contact your veterinarian for more information.

Finally, remember that adding selenium is not a cure-all for nutrition problems. A balanced ration permits all trace minerals and vitamins to work properly.

required every batch of supplement to be analyzed.

It was because of that requirement that the discrepancies in environmental impact law were brought to Skorupa's attention. Dave Eisenberg, of Micro Tracers in San Francisco, asked Skorupa to review the environmental study announced in the *Federal Register*.

Micro Tracers, Inc., along with the National Mixer-Feed Association, the American Council of Independent Laboratories, the Natural Resources Defense Council, and the State of California Health and Welfare Agency, all filed objections to the 1987 amendment.

Everyone involved is trying to protect what is important to him — just as the dairy industry protects its right to farm profitably.

Health advantages

Selenium, at the 0.3 ppm level, provides important health benefits.

In conjunction with vitamin E, selenium reduces the duration and frequency of mastitis infection and reduces the incidence of metritis and retained placentas, says Weiss, who is one of the nation's foremost experts on selenium and vitamin E.

Selenium supplemented at only 0.1 ppm will probably not provide these benefits to the cow. At such a minimal level, the only benefit will be to prevent extreme deficiencies and the resulting complications those deficiencies bring, such as white muscle disease.

Animals have developed an antioxidant system to protect themselves from highly reactive molecules, called free radicals, that are the byproducts of everyday functions such as breathing. Selenium is one part of that antioxidant system.

Certain types of immune cells also purposely produce free radicals to kill invading bacteria. In an ideal situation, free radicals are produced by these immune cells, the free radicals help kill invading bacteria, and then the antioxidant system prevents free radicals from causing damage to other body tissues.

When adequate antioxidants such as vitamin E and selenium are present, the free radicals react with antioxidants rather than with proteins or cellular membranes. The

Continued to page 49