

## It's 10 p.m. Do You Know Where Your Vitamins & Minerals Are?

Vitamins and trace minerals are critical to health and performance of cattle. They function in the body much like spark plugs in a car – they are a very small component that makes reactions occur at a faster and more efficient rate. Without the vitamins and trace minerals, animal performance is reduced and immune function is impaired.

Traditionally, feed companies have used oxide and sulfate forms of zinc, copper, manganese, and iron for cattle feed. Although oxides and sulfates are cheap to use, they have very low bioavailability and they destroy vitamin potency in premixes and feeds during storage.

BABY DOLL feeds utilize organic trace minerals which have the highest bioavailability and protect vitamin activity. Organic trace minerals are very cost effective since \$2-3 per head for minerals may reduce medication cost by \$15-20 in feedlot cattle or increase weaning weight by 25-30 lb in a cow-calf operation. With oxides and sulfates, much of the expensive vitamins and trace minerals shown on the feed tag will either be degraded in the feed bag and never reach the bunk or never be absorbed by your cattle.

### Organic Trace Minerals: Improved Reproduction

Perhaps the most profound effect of organic trace minerals is the improvement in reproductive performance compared to oxide and sulfate forms of trace minerals. Research at the University of Minnesota (DiCostanzo, et al. 1985) showed dramatic results with organic trace minerals in cows and heifers. Days to 1st estrus and conception were lower with the organic trace minerals than with the control diet. Services per conception and % pregnant at 1st service were numerically lower with the organic trace minerals compared to the control diet. Consider the economic impact of getting cows bred early. Getting heifers bred 18 days sooner translates into 30 lbs heavier weaning weights. With cows, 11 days earlier conception translates into 18 lbs heavier weaning weights. Fewer services per conception means more bull power from your bull or fewer straws if you breed your cows A.I. Either way, organic trace minerals pay!

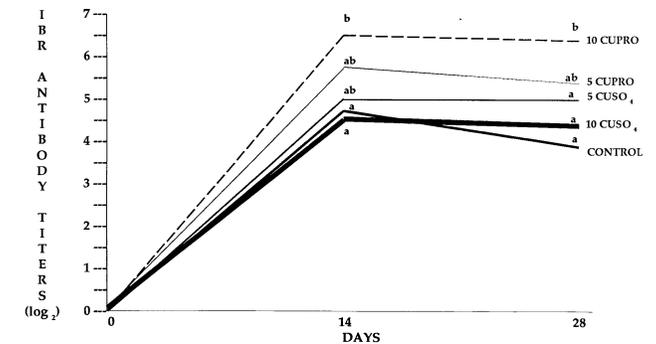
**Table 1. Effect of Organic Trace Minerals on Reproductive Performance of Heifers and Cows**

|                                  | Organic           | Control           |
|----------------------------------|-------------------|-------------------|
| Days to 1st Estrus, heifers      | 66.0 <sup>a</sup> | 86.0 <sup>b</sup> |
| Days to 1st Estrus, cows         | 52.0              | 60.0              |
| Days to Conception, heifers      | 16.0 <sup>c</sup> | 34.0 <sup>d</sup> |
| Days to Conception, cows         | 21.0 <sup>c</sup> | 32.0 <sup>d</sup> |
| Services/Conception, heifers     | 1.1               | 1.6               |
| Services/Conception, cows        | 1.0               | 1.7               |
| Pregnant at 1st Service, heifers | 88.0%             | 56.0%             |
| Pregnant at 1st Service, cows    | 95.0%             | 40.0%             |
| Conception Rate, heifers         | 88.9 %            | 90.0 %            |
| Conception Rate, cows            | 95.0 %            | 83.3 %            |

a, b means within a row without common superscript are different (P<.05)  
c, d means within a row without common superscript are different (P<.10)

### Organic Trace Minerals: Improved Health

Immune system function depends on adequate amounts of bioavailable trace minerals. Many studies have shown lower medication costs, fewer sick days, and reduced incidence of foot rot in feedlot cattle with organic trace minerals compared to inorganic trace minerals. Classic research by Nockels and Odde at Colorado State University showed higher antibody titers in cattle fed organic trace minerals (CUPRO) than cattle fed inorganic trace minerals (CUSO4).



Nockels and Odde (1991)

Figure 3

*From the code of the old west:*

It don't take a genius to spot a goat in a flock of sheep.

**Organic Trace Minerals: Protect Vitamin Potency**

Research from the University of Minnesota has shown a clear advantage of organic trace minerals versus inorganic trace minerals in vitamin/trace mineral premixes for feed. As the table below shows, organic trace minerals protect vitamins. Notice vitamin A loss is 0.74% per month by itself. When mixed with other vitamins, the loss increases to 3.50% loss per month. This rate nearly triples to 8.97% per month when inorganic trace minerals are mixed with the vitamins. With the protection of organic trace minerals, the loss rate is only 3.07%. This same phenomena occurs with vitamin D<sub>3</sub>, vitamin K, vitamin B<sub>12</sub>, niacin, thiamin mononitrate, folic acid, pyridoxine, and choline chloride.

Use of **Organic Trace Minerals** **significantly** reduced the loss of vitamin potency in premixes containing **Inorganic Trace Minerals**. Vitamin potency **loss** can be reduced by approximately 40-50% with **Organic Trace Minerals** versus **Inorganic Trace Minerals** in a vitamin-trace mineral premix.

***We Use Only Organic Zinc, Copper, Iron & Manganese Trace Minerals...***

***So What's On The Tag Stays In The Bag & Gets Absorbed By Your Cattle***

**Organic Trace Minerals: Highest Bioavailability**

What happens to trace minerals after they are consumed? Some forms are utilized by the body, while other forms are excreted in the manure and/or urine. The measure of how well the nutrient is utilized is "bioavailability". Different forms of trace minerals are compared to the sulfate form which is designated as 100% bioavailability. From the table below, one can see the organic trace minerals are 2-3 times as bioavailable as sulfate or oxide forms of zinc. Similar relationships are seen with copper, manganese, and iron.

The bonding strength and stability of organic trace minerals prevent interference from other minerals such as phytate phosphorus, calcium, sulfur, molybdenum, and from fiber. The result of this high bioavailability is efficient mineral absorption and utilization which improves reproduction, immune system function, growth and performance. Improved performance results in improved profitability of cattle producers!

| <u>Zinc Source</u>          | <u>Relative Bioavailability</u> |
|-----------------------------|---------------------------------|
| Zinc Oxide                  | 61                              |
| Zinc Sulfate                | 100                             |
| Zinc Polysaccharide Complex | 227                             |
| Zinc Methionine             | 206                             |
| Zinc Amino Acid Complex     | 219                             |
| Zinc Chelate                | 227                             |
| Zinc Proteiniate            | 159                             |

Source: Feed Management, December, 1996, p. 27

**AVERAGE MONTHLY LOSS (%) IN VITAMIN POTENCY DURING 120 DAY STORAGE PERIOD**

| VITAMIN MEASURED     | Single Vitamin Only | Vitamin Premix (NO TRACE MINERALS) | Vitamin Premix INORGANIC trace minerals | Vitamin Premix ORGANIC trace minerals | Significant difference Organics vs Inorganics? |
|----------------------|---------------------|------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------------------|
| Vitamin A            | 0.74 %              | 3.50 %                             | 8.97 %                                  | 3.07 %                                | YES P<.01                                      |
| Vitamin D3           | 0.00 %              | 3.02 %                             | 4.48 %                                  | 2.68 %                                |                                                |
| Vitamin E            | 0.88 %              | 1.61 %                             | 1.12 %                                  | 1.39 %                                |                                                |
| Vitamin K            | 0.00 %              | 6.01 %                             | 10.16 %                                 | 2.23 %                                | YES P<.01                                      |
| Vitamin B12          | 2.82 %              | 2.05 %                             | 5.43 %                                  | 2.32 %                                | YES P<.05                                      |
| Niacin               | 0.83 %              | 3.49 %                             | 3.24 %                                  | 1.08 %                                |                                                |
| Riboflavin           | 0.00 %              | 3.33 %                             | 2.74 %                                  | 2.69 %                                |                                                |
| Thiamine Mononitrate | 0.00 %              | 2.64 %                             | 7.90 %                                  | 4.08 %                                | YES P<.01                                      |
| Folic Acid           | 0.35 %              | 2.19 %                             | 5.56 %                                  | 4.34 %                                | YES P<.05                                      |
| Calcium Pantothenate | 0.00 %              | 0.00 %                             | 0.00 %                                  | 0.06 %                                |                                                |
| Pyridoxine           | 0.32 %              | 5.87 %                             | 8.64 %                                  | 4.94 %                                | YES P<.01                                      |
| Choline Chloride     | 1.25 %              | 2.14 %                             | 4.88 %                                  | 3.13 %                                | YES P<.05                                      |
| Biotin               | 0.00 %              | 4.35 %                             | 2.92 %                                  | *                                     |                                                |