

LOW COST COW/CALF PROGRAM

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How Much Copper?

Have you ever tried to purchase a trace mineral (TM) supplement that does not contain added iron? Any TM package is likely to contain some iron as a contaminant contained in the mineral salts of the other nutrients - but iron intentionally included? Because of its interference with copper utilization in tissues, every effort is made to avoid dietary iron. The forage contains enough and not uncommonly, too much already. Why then should iron be added to the TM package? For the most part, no rancher in his right mind would purchase any supplement unless it contained plenty of iron. After all, he (and particularly females in the family) suffers from "Iron Tired Blood." Anemia is easily avoided; simply take plenty of iron supplements. Better yet, eat beef. It is touted as an excellent source of iron. If the rancher needs supplemental iron, so must his cattle. In response, any salesperson worth his salt is going to feature a product that contains added iron. He would be crazy not to. Can you purchase a supplement that does not contain added copper? Yes, you can but you must shop carefully. Copper is the byword in TM supplementation right now. Providers insist that the source of copper is equally important. An inexpensive source such as copper sulfate simply will not do. It must be chelated (actually proteinated - copper is bound to an amino acid) if it is to be readily available. The higher cost for the organic copper is well worth it.

What do the Cows Say?

The U of NE¹ recently reported a study with the industry's problem child—the first-calf cow. Will supplemental copper improve calf performance and diminish rebreeding problems? The researchers selected 75 heifers in 1997 bred to calve in early March. The study was repeated in 1998 with 120 bred heifers. In December of each year, the cows were placed in a drylot and given ad libitum access to grass

hay and a TM-free supplement. Around January 15 the cows were allotted to three treatment groups: 1) **Control**, no supplemental copper; 2) **Inorganic**, CuSO₄; 3) **Organic**, Availa-Cu 100 mg Cu. Because of the anticipated increased availability of the Organic Cu, it was supplemented at ½ the rate of the Inorganic Cu (100 mg vs. 200 mg per day, respectively). To make things a little tougher, the Cu antagonists (iron and molybdenum) were included in the supplements. The approximate levels of the trace elements fed to the heifers each day are shown in the table below. There is some variation in levels from pre-

Approximate daily trace element intake (mg/cow)			
Element	Control	Inorganic	Organic
1997			
Preacting			
Copper	50	210	150
Iron	4250	4380	4570
Molybdenum	50	50	50
Postcalving			
Copper	80	300	150
Iron	5000	4800	5490
Molybdenum	50	50	60
1998			
Preacting			
Copper	60	250	150
Iron	1430	1680	1530
Molybdenum	15	15	15
Postcalving			
Copper	50	220	110
Iron	1390	1430	1400
Molybdenum	18	18	18

calving to postcalving. This result was due to the fact that upon calving, corn and a soybean meal/dehy-alfalfa supplement were fed along with the grass hay. Remember, these cattle primarily calved in the winter.

Animal Performance

No differences in cow weights or BCS were found among treatments. Calf birth weights and May 12 weights were not different among treatments. Milk production estimates were not different among treatment groups. Calf weights at weaning were not different among treatments. The reproductive performance is presented in the table below. No treatment differences were observed within year for estrus be-

fore May 15 or cows pregnant in 60 d breeding. In 1998, however, the control group fell out of bed. Further, the organic group of cattle did somewhat better than the inorganic group. The authors explain this result as probably due to the yearly differences in the copper status of the herd

Reproductive performance.			
Trait	Cont	Inorg	Org
1997			
No. of cows	22	23	24
Estrus by May 15, %	5	9	13
Preg by 30 d breeding, %	86	57	75
Preg by 60 d breeding, %	100	91	88
Day of conception	170	178	174
2nd calving day	90	97	92
1998			
No. of cows	23	30	27
Estrus by May 15, %	9	23	30
Preg by 30 d breeding, %	61	80	85
Preg by 60 d breeding, %	87	87	93
Day of conception	178	170	168
2nd calving day	92	85	81

at the beginning of the treatment period. Serum did not reflect the copper status of the animals whereas liver content did. Liver copper content was in direct response to the amount of copper supplemented. The livers of the unsupplemented cows contained the least amount, while the livers of the inorganic group had twice the level of the organic group. Inorganic copper was fed at twice the level of the organic copper.

Rumors

"I was in the Casper School and it has helped me financially already. I had mineral formulated for me and it cost a lot less than the mineral I had been supplementing with. Please keep up the good work, as many will greatly benefit."

Thank you, Kent Hunter, WY

Schools In 2001

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¹ Muehlenbein, E.L., D.R. Brink, G.H. Deutscher, M.P. Carlson and A.B. Johnson. 2001. Effects of inorganic and organic copper supplement to first-calf cows on cow reproduction and calf health and performance. J. Anim. Sci. 79:1650.