

LOW COST COW/CALF PRODUCTION

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Precise Nutrition

"A balanced supplement that accounts for forage deficiencies relative to animal requirements – *no more/no less.*" You recognize this as the third Key to successful Low Cost Cow/Calf Production. All of us wonder, however, if the levels of nutrients (particularly the trace minerals) we provide are in sufficient quantities. Reproduction and associated physiological functions are of primary concern. The trace minerals are related to conception, pregnancy maintenance, ease of calving and timely delivery of the afterbirth. Establishing immunity to infectious diseases also is associated with the trace elements. There must be adequate circulating levels and hepatic stores of the traces at the time of vaccination. If not, there is no immunity. When you flash your custom supplement formulation at the feed store, you are encouraged to add a little of this and a little of that. We are pressured into believing that we should include just a tad more only to be safe. It is not as bad as if *a little is good - more is better* but almost. We also are concerned about sources of traces and their bioavailability. The better bioavailability of the high-dollar proteinated minerals is pushed at all of the nutrition seminars we attend.

How Much is Too Much

Researchers at the U of Nebraska¹ were concerned about the level and source of the traces as they may relate to conception with first-calf cows. The study involved 236 head over two years. Calving commenced in early Feb. After calving, cows had free access to grass hay and were fed a SBM + dical supplement. The cattle were allotted to three dietary treatments. **Controls**, no added mineral. **Organic** group was fed a trace mineral package containing copper lysine, cobalt glucoheptonate, manganese methionine and zinc methionine. **Inorganic** group received the same level of traces in an inorganic form. These included copper sulfate, cobalt carbonate,

manganese sulfate and zinc sulfate. The following table shows the total quantity of each mineral consumed, including the contributions from the hay and soy. The mineral content of the hay from year to year was quite consistent for all of the traces except manganese, for which there was a four-fold difference.

	Total trace element intake (mg/d).		
	Cont	Org	Inorg
Cu	50	170	172
Co	7	28	29
Mn-94	352	518	522
	95	1406	1467
Zn	158	500	506

More is Better ?

Liver was analyzed for the traces prior to supplementation and at the end of the 60-day feeding period. Levels of copper, zinc and manganese contained in the liver are shown below. Cobalt is utilized by the rumen microorganisms in the formation of

	Trace elements in liver at start of supplementation and 60 days later (ppm DM).	
	0	60
	Copper	
Cont	67	75
Org	48	184
Inorg	43	174
	Zinc	
Cont	131	98
Org	137	112
Inorg	134	102
	Manganese	
Cont	10	11
Org	12	10
Inorg	11	10

vitamin B-12 and is not stored in tissues. The copper contained in the liver increased during the 60-day supplement period while zinc and manganese did not. There was no beneficial effect to supplying the minerals in an organic form. **Save your money.** The average feed consumption was 19.4 lb, which provided 11 Mcal of NEM. When basing consumption on NEM, as we do in the School, 10.04 Mcal of NEM came from the hay alone.

The Requirements

Recommended levels of these elements by the NRC (Nutrient Requirements of Beef

Cattle 1996) are shown below. For comparison, the levels recommended at the School also are shown. It is apparent that I too am concerned about trace element levels and their relationship to immunity.

	Recommended daily allowances by NRC vs Diven (mg/d).	
	NRC	Diven
Copper	88	147.87
Cobalt	0.88	0.79
Manganese	352	358.34
Zinc	264	358.34

Our levels, however, do not compare with the elevated levels used in this study. The authors' original intent was to determine the impact of high levels of these minerals upon rebreeding the first-calf cow. **Percentages open at the conclusion of a 70-day breeding season were Controls 0, Organic 14 and Inorganic 14.**

Rumors

"The simple mineral supplement really cheapened up wintering bulls. They came through in BCS 5." Thank you, Jim Applegate, NE.

Schools In 1999 – Y2K

Locations in Canada to be announced.

Swift Current, SK January 24 – 27, '00

Red Deer, AB February 7 – 10, '00

Lethbridge, AB February 22 – 25, '00

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Baker City, OR June 7 - 10, '99

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Ogallala, NE September 20 - 23, '99

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¹ Olson, PA, DR Brink, DT Hickok, MP Carlson, NR Schneider, GH Deutscher, DC Adams, DJ Colburn and AB Johnson. 1999. Effects of supplementation of organic and inorganic combination of copper, cobalt, manganese and zinc above nutrient requirement levels on postpartum two-year-old cows. J. Anim. Sci. 77:522.