Fetal/Newborn Calf Trace Mineral Reference Ranges

Source: Mineral Levels in Animal Health – 2nd Edition (R. Puls, 1994)

Fetal/Newborn Calf Trace Mineral Reference Ranges – Serum

Trace Mineral	Sample	Concentration
Cobalt	Serum	0.9-15 ppb
Copper*	Serum	0.6-1.5 ppm
Iron**	Serum	1.3-2.5 ppm
Magnesium**	Serum	18-35 ppm
Manganese**	Serum	0.006-0.07 ppm
Molybdenum	Serum	0.01-0.10 ppm
Selenium**	Serum	0.13-0.16 ppm
Zinc**	Serum	1.5-2.5 ppm

Notes:
* Copper in blood will decrease when liver stores become depleted (approx. ≤10 ppm ww). Therefore, normal blood copper does not rule out copper deficiency
** Hemolyzed samples will result in falsely high concentrations

Fetal/Newborn Calf Trace Mineral Reference Ranges – Liver (wet weight basis)

Trace Mineral	Concentration
Cobalt	20-85 ppb
Copper*	30-150 ppm
Iron	40-400 ppm
Magnesium**	100-250 ppm
Manganese***	0.6-6.0 ppm
Molybdenum	0.14-1.40 pm
Selenium*	0.3-1.20 ppm
Zinc***	25-100 ppm

*Fetus/newborn accumulates at the expense of the dam (Se will be approx. 2-4x the maternal concentration)
**Increase with gestation (Mn - 154 ppm at 100 days, 277-320 ppm at 280 days; Zn – 11-100 ppm at 100 days, 20-150 ppm at 280 days)
**Vary with stage of gestation: will be low (<1 ppm ww) until 2-3 weeks of age