

Porcine Metal & Mineral Data (where known)

Minerals measured by ICP/MS. Note that our reference data source has evolved from relying on Puls, Mineral Levels in Animal Health, 1994 to including 'The use of blood analysis to evaluate trace mineral status in ruminant livestock', 2011, by Tom Herdt and Brent Hoff, *Vet Clin Food Anim* 27:255-283. We continue to gathering population data for multiple species to adjust the adequate ranges.

Liver (Dry weight basis) – Determined gravimetrically

Analyte	Porcine Normal Range (adults and growing pig)	Porcine Normal Range (neonates)	Units	Deficient	High	Toxic
Cobalt	1.0 - 2.0	1.0 - 2.0	ug/g dwt	-	6.0 - 8.0	> 10.0
Copper	20 - 100	200 - 220	ug/g dwt	< 5; < 24	> 60	> 600
Manganese	9 - 16	9 - 16	ug/g dwt	< 4	> 20	-
Molybdenum (sows)	2.4 - 5.2		ug/g dwt	-	-	-
Molybdenum (growers)	3.2 - 7.6		ug/g dwt	-	-	-
Selenium	1.6 - 4.8	1.6 - 4.8	ug/g dwt	< 0.40	> 6.0	> 12.0
Zinc	160 - 360	160 - 360	ug/g dwt	< 100	> 800	> 2000
Arsenic	< 0.8	< 0.8	ug/g dwt	-	> 4	> 8
Cadmium	0.2 - 2.00	< 4	ug/g dwt	-	5.6 - 36	> 100
Lead	< 2.4	< 2.4	ug/g dwt	-	> 20	> 150
Thallium	-	-	ug/g dwt	-	-	-
Dry wt. fraction	25 - 34	18 - 29	%			

Iron (Adult)	400 - 800	-	ug/g dwt	< 200	-	-
Injected ¹ (Day 1-3)	-	2400 - 8000	ug/g dwt	< 60	-	-
Injected ¹ (Day 10)	-	400 - 520	ug/g dwt	< 60	-	-
Injected ¹ (Day 20)	--	240 - 400	ug/g dwt	< 60	-	-
Injected ¹ (Day 30)		100 - 120	ug/g dwt	< 60	-	-

¹When 100 mg Fe injected at days 1-3

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Classification	ID	Revision	Effective Date
S-TOX-A	73985	3	10/18/2021 4:19:14 PM

Blood and Serum/Plasma

Analyte	Sample	Porcine Normal Ranges	Units	Deficient	High	Toxic
Cobalt	Serum	-	ng/mL	-	-	-
Copper	Serum	1.3 – 3.0	µg/mL	< 0.4	1.7 – 3.0	> 4.5
Iron	Serum	100 – 150	ug/dl	< 80	-	-
Manganese	Serum	-	ng/mL	-	-	-
Molybdenum	Serum	-	ng/mL	-	-	-
Selenium	Serum	180 – 300	ng/mL	< 60	-	> 500
Selenium	Blood	200 – 350	ng/mL	< 100	-	> 2500
Zinc	Serum	0.4 – 0.8	µg/mL	< 0.25	-	> 1.4
Arsenic	Blood	< 0.01	µg/mL	-	-	-
Cadmium	Blood	-	µg/mL	-	-	-
Lead	Blood	< 0.10	µg/mL	-	> 0.30	> 1.20
Thallium	Blood	-	µg/mL	-	-	-