

IDEXX Trace Elements Reference Intervals



CATTLE

	Sample Unit	Deficient	Marginal	Adequate	Excessive
Copper	Serum Cu $\mu\text{mol/L}$	<4.5	4.5-8	8-20	>20
	Serum Fx U/L	<8	8-15	15-35	>35
	Plasma Cu $\mu\text{mol/L}$			9-26	
	• Liver Cu $\mu\text{mol/kg}$	<45	45-95	95-2000	>2000
Selenium	Whole blood Se $\eta\text{mol/L}$	<130	130-250	250-2000	>2000
	Serum Se $\eta\text{mol/L}$	<85	85-150	150-3500	>3500
	EDTA GPx KU/L	<0.5	0.5-2	2-25	>25
	Liver Se $\eta\text{mol/kg}$	<600	600-850	850-10000	>10000
B12	Serum B12 $\rho\text{mol/L}$		<93	93-1000	
	Liver B12 $\eta\text{mol/kg}$	<200	200-370	370-3000	>3000
Zinc	# Serum Zn $\mu\text{mol/L}$			11-20	
	Liver Zn mg/kg			25-100	

KEY

- In late gestation, a min of 300 $\mu\text{mol/L}$ liver Cu is recommended. On some farms higher concentrations are required over the Winter to Spring period.
- # For Facial Eczema prevention, 20-35 $\mu\text{mol/L}$ serum Zn is recommended.

References available on request.

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SHEEP

	Sample Unit	Deficient	Marginal	Adequate	Excessive
Copper	Serum Cu $\mu\text{mol/L}$		<11	11-25	>25
	Liver Cu $\mu\text{mol/kg}$	<45	45-95	95-2000	>2000
Selenium	Whole blood Se $\eta\text{mol/L}$	<130	130-250	250-6500	>6500
	Serum Se $\eta\text{mol/L}$			NR	
	EDTA GPx KU/L			NR	
	Liver Se $\eta\text{mol/kg}$	<250	250-450	450-15000	>15000
B12	Δ Serum B12 $\rho\text{mol/L}$	<335	335-500	500-1500	>1500
	$\wedge$ Liver B12 $\eta\text{mol/kg}$	<220	220-375	375-1500	>1500
Zinc	Serum Zn $\mu\text{mol/L}$			11-20	
	Liver Zn mg/kg			25-100	



DEER

	Sample Unit	Deficient	Marginal	Adequate	Excessive
Copper	Serum Cu $\mu\text{mol/L}$	<5	5-8	8-20	>20
	Serum Fx U/L	<9	9-15	15-35	>35
	Liver Cu $\mu\text{mol/kg}$	<60	60-100	100-2000	>2000
Selenium	Whole blood Se $\eta\text{mol/L}$			*140-2000	>2000
	Serum Se $\eta\text{mol/L}$			NR	
	EDTA GPx KU/L			NR	
	Liver Se $\eta\text{mol/kg}$	<200	200-440	>440	
B12	Serum B12 $\rho\text{mol/L}$			120-1000	>1000
	Liver B12 $\eta\text{mol/kg}$			*280-3000	>3000
Zinc	Serum Zn $\mu\text{mol/L}$			NE	
	Liver Zn mg/kg			*25-100	



GOATS

	Sample Unit	Deficient	Marginal	Adequate	Excessive
Copper	Serum Cu $\mu\text{mol/L}$		<11	11-25	>25
	Serum Fx U/L			23-53	
	Liver Cu $\mu\text{mol/kg}$			>160	
Selenium	Whole blood Se $\eta\text{mol/L}$			* >250	
	Serum Se $\eta\text{mol/L}$			NR	
	EDTA GPx KU/L			NR	
	Liver Se $\eta\text{mol/kg}$	<500	500-1100	1100-5000	>5000
B12	Serum B12 $\rho\text{mol/L}$			* >117	
	Liver B12 $\eta\text{mol/kg}$			NE	
Zinc	Serum Zn $\mu\text{mol/L}$			NE	
	Liver Zn mg/kg			NE	

KEY

NR Not recommended.

Δ Age related RIs, lambs ($\leq 1\text{yr}$) commonly tested. Adult serum B12 >300 $\rho\text{mol/L}$.

$\wedge$ Adults liver B12 >200 $\eta\text{mol/kg}$.

* Tentative only.

NE Not established.

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