

COW

BIOCHEMICAL REFERENCES

Parameters	Value	Unit
Liver function		
Bilirubin (total)	0 – 1.9	mg/dl
Bilirubin (direct)	0 – 0.44	mg/dl
Bilirubin (indirect)	0 – 1	mg/dl
Bile acids (BA)	<50	mg/ml
Icterus index	2 – 15	U
BSP (sulfobromophthalein)	2.5 - 4	---
Metabolites		
Cholesterol	40 – 230	mg/dl
Cholesterol (Ester)	55 – 88	mg/dl
Cholesterol (Free)	22 – 52	mg/dl
Glucose	35 – 85	mg/dl
Free Fatty acids	30 – 100	mg/l
Carotene	25 – 950	---
Carotenol	10 - 30	---
Renal function		
Creatinine	0.6 – 2.7	mg/dl
Blood Urea	20 – 40	mg/dl
Amino acid nitrogen	4 – 8	mg/dl
BUN (blood urea nitrogen)	5 – 30	mg/dl
NPN (non- protein nitrogen)	20 – 55	mg/dl
Ketones		
Triglycerides	0 – 14	mg/dl
Lactic acid	5 – 20	mg/dl
Uric acid	0 – 2	mg/dl
Acetone	0 – 10	mg/dl
Acetoacetate	0 – 1.1	mg/dl
Beta hydroxybutyrate	5.9 – 13.9	mg/dl
Pyruvate	54 - 24	---
Acid : base status		
Bicarbonate	17 – 31	mmol/l
CO ₂	20 – 33	mEq/l
PCO ₂	34 – 53	mmHg
PO ₂	89	mmhg
pH	7.27 – 7.53	---

Proteins		
Total protein	5.7-8.6	g/dl
Albumin	2.1-4	g/dl
Globulin	2.9-4.9	g/dl
α Globulin	0.75-0.88	g/dl
α 1 Globulin	0.7-1.2	g/dl
β Globulin	0.8-1.12	g/dl
β 1 Globulin	0.6-1.2	g/dl
γ Globulin	1.69-2.25	g/dl
γ 1 Globulin	1.6-3.2	g/dl
Albumin / Globulin ratio	0.6-1.3	---
Protein – bound Iodine	2.7-4.1	µg/dl
Electrolytes		
Chloride	80-115	meq/l
Osmolality	270-306	mosm/kg
Anion gap	14-26	meq/l
Potassium	3.1-5.8	meq/l
Sodium	130-152	meq/l
Enzymes		
ALT • SGPT	6.9-40	U/L
Alkaline phosphatase	0-500	U/L
Amylase	41.3-98.3	U/L
AST • SGOT	42-132	U/L
CPK • CK	14.4-280	U/L
GGT	4.9-3.9	U/L
Lipase	1.8-2.3	U/L
SDH	4.3-18.4	U/L
LDH	308-1445	U/L
LDH-1	39.8-63.5	%
LDH-2	19.7-34.8	%
LDH-3	11.7-18.1	%
LDH-4	0-8.8	%
LDH-5	0-12.4	%
RBC acetylcholinesterase	1470-2430	U/L
Arginase	0-1.8	U/ml
OCT (Ornithine carbamoyl transferase)	4.7-20	U/L
Butyrylcholinesterase	70	U/L
(GD) Glutamate dehydrogenase	31	U/L
Glutathione reductase	19.5	U/100gHb
Isocitrate dehydrogenase	9.4-21.9	U/L

Hormones		
Cortisol (0 hour)	1-2.7	µg/dl
Cortisol (2 hour)	2.7-6	µg/dl
Peripheral plasma concentration of Corticoids	7.6	ng/ml
Peripheral plasma concentration of Corticoids Progesterone (estrus)	0.5	ng/ml
Peripheral plasma concentration of Corticoids Progesterone (diestrus)	6.6	ng/ml
Peripheral plasma concentration of Estradiol (estrus)	25	pg/ml
Peripheral plasma concentration of Estradiol (diestrus)	<7	pg/ml
Total Serum Thyroxine	4.1-0.7	µg/dl
T3 (RIA)	40-170	ng/ml
T4 (RIA)	3.6-9	ng/ml
Insulin	0-35.88	pmol/l
Minerals		
Calcium (total)	8-12.4	mg/dl
Calcium (ionized)	4.5-6.1	meq/l
Iron	57-162	µg/dl
Iron-binding capacity	63-350	µg/dl
Magnesium	1.2-5	mg/dl
Phosphorus	4-8	mg/dl
Copper	32.8-35.2	---
Lead	0-24	---

HAEMATOLOGICAL REFERENCES

Parameters	Value	Unit
Red Blood Cells		
RBC count	5-15	10 ⁶ /μl
Haemoglobin	8-15	g/dl
PCV	23-46	%
MCV	30-60	fl
MCH	11-20	pg
MCHC (microhematocrit)	28-39	g/dl
MCHC (wintrobe)	26-34	g/dl
Reticulocytes	0	% of RBC
Erythrocyte resistance to hypotonic saline (Erythrocyte fragility) <minimum>	0.52-0.66	%
Erythrocyte resistance to hypotonic saline (Erythrocyte fragility) <maximum>	0.42-0.52	%
Erythrocyte surface area	62	Sq m/kg bwt
RBC diameter	3.6-9.6	μ
RBC life span	160	days
ESR (wintrobe)	2.25-4	mm/day
Mean volume of a red cell	40-60	fl
Mean Hb of a red cell	11-20	pg
Hb concentration in a red cell	30-39	g/dl
White Blood Cells		
WBC count	4-12	10 ³ /μl
Neutrophils (mature)	0.6-6	10 ³ /μl
Neutrophils (mature)	15-45	%
Neutrophils (bands)	0-0.12	10 ³ /μl
Neutrophils (bands)	0-2	%
Lymphocytes	1.4-7.5	10 ³ /μl
Lymphocytes	45-75	%
Monocytes	0-0.85	10 ³ /μl
Monocytes	2-7	%
Eosinophils	0-2.4	10 ³ /μl
Eosinophils	2-20	%
Basophils	0-0.3	10 ³ /μl
Basophils	0-2	%
Leukocytes	4-13	10 ³ /μl
Neutrophil/Lymphocyte ratio	0.3-0.6	---

Coagulation		
Platelets	1-8	10/ μ l
Fibrinogen	100-700	mg/dl
Myeloid/Eythroid ratio	0.3-1.85	---
Plasma Protein/Plasma Fibrinogen ratio	12-30	---
Thrombocytes	100-800	10 ³ / μ l
Thrombin time	7.8-9.5	seconds
Prothrombin time	18-55	seconds
Partial thromboplastin time	37-80	seconds
Bleeding time	1-5	minutes
Clotting time (Lee White)	4-15	minutes
Clotting time (Cap .tube)	3-15	minutes
Total data		
Blood volume	52.4-62	ml/kgbwt
Blood volume	40000	ml \cdot 8%bwt
Plasma volume	36.3-40.6	ml/kgbwt
Specific Gravity of Blood	1.043-1.061	---
Blood Pressure	134-140/ 88-95	mmHg

IMMUNOLOGY REFERENCES

Parameters	Value	Unit
Serum Ig levels		
IgG	1700-2700	mg/dl
IgG 1	1100	mg/dl
IgG 2	790	mg/dl
IgM	250-400	mg/dl
IgA	10-50	mg/dl
IgE	trace	---
Ig Isotypes & Sub-Isotypes		
IgG	G1-G2 (G2-G2b)	
IgA	A	
IgM	M	
IgE	E	
Peripheral blood Lymphocytes (T-cells)	40-70	%
Peripheral blood Lymphocytes (B-cells)	20-40	%
IgA secretion in Colostrum	400	mg/dl
IgA secretion in Milk	10	mg/dl
IgA secretion in Nasal secretion	200	mg/dl
IgA secretion in Saliva	56	mg/dl

IgA secretion in Tears	260	mg/dl
Tissue layers intervening between maternal and fetal circulation	5	n
Placental transfer of Ig	0	
Colostrum transfer of Ig	+++	
Colostrum IgA level	100-700	mg/dl
Colostrum IgM level	300-1300	mg/dl
Colostrum IgG level	3400-8000	mg/dl
Colostrum IgG1 level	4760	mg/dl
Colostrum IgG2 level	290	mg/dl
Milk IgA level	10-50	mg/dl
Milk IgM level	10-20	mg/dl
Milk IgG level	50-750	mg/dl
Milk IgG1 level	59	mg/dl
Milk IgG2 level	2	mg/dl
Metabolic half-lives of serum IgG	17(G1), 22(G2)	days
Metabolic half-lives of serum IgM	2.8	days
Metabolic half-lives of serum IgA	4.8	days
Metabolic half-lives of serum IgE	2	days
Pancreas Secretion	4	L/100kg bw/day
Norepinephrine in adrenal glands	29	%
Total Catecholamines in adrenal glands	1.8	Mg/g whole gland
Mitochondrial density in liver	2.23	n/g dry wt.
Nephron count in one Kidney	4	10
Brain weight/Body weight ratio	1/682	---
Saliva secretion	100-200	L/day
Fields of vision		
Divvergence between visual axes	90-115	degree
Panoramic field	330-360	degree
Binocular field	25-50	degree
Sleep and Wakefulness during 24 hours		
Alert Wakefulness	52.3-67.2	%
Drowsiness and DS	31.2-44.5	%
AS (Activated sleep)	0-3.1	%