

Biological Variation Values

Desirable Analytical Quality Specifications for Imprecision, Bias and Total Error Upon Biological Variation

The following values are provided as a service to Bio-Rad Customers and are based upon desirable performance. The values are derived from Ricos C, Alvarez V, Cava F, Garcia-Lario JV, Hernandez A, Jimenez CV, Mininchela J, Perich C, Simon M. "Current databases on biologic variation: pros, cons and progress" Scand J Clin Lab Invest 1999;59:491-500. These values are updated/modified with the most recent specifications made available in 2014. *(denotes updated values)

S = serum; U = urine; P = plasma; B = blood

CV_w = within-subject biological variation; CV_b = between-subject biological variation; Imp = imprecision; TE_a = total allowable error

	ANALYTE	BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
		CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
S	11-Deoxycortisol	21.3	31.5	10.7	9.5	27.1	34.3
S	17-Hydroxyprogesterone	19.6	50.4	9.8	13.5	29.7	36.4
U	5-HIAA concentration, 24 h	20.3	33.2	10.2	9.7	26.5	33.4
S	5'Nucleotidase	23.2	19.9	11.6	7.6	26.8	34.7
S	α1-Acid glycoprotein	11.3	24.9	5.7	6.8	16.2	20.0
S	α1-Antitrypsin	5.9	16.3	3.0	4.3	9.2	11.2
S	α1-Globulin	11.4	22.6	5.7	6.3	15.7	19.6
S	α2-Globulins	10.3	12.7	5.2	4.1	12.6	16.1
U	α1-Microglobulin	33.0	58.0	16.5	16.7	43.9	55.1
S	α2-Macroglobulin	3.4	18.7	1.7	4.8	7.6	8.7
P	α-Aminobutyric Acid (AABA)	24.7	32.3	12.4	10.2	30.5	38.9
S	α-Amylase	8.7	28.3	4.4	7.4	14.6	17.5
U	α-Amylase	94.0	46.0	47.0	26.2	103.7	135.7
S	α-Amylase, pancreatic	11.7	29.9	5.9	8.0	17.7	21.7
S	Acid phosphatase (ACP)	8.9	8.0	4.5	3.0	10.3	13.4
P	Activated partial thromboplastin time	2.7	8.6	1.4	2.3	4.5	5.4
S	Adenosine Deaminase (ADA)	11.7	25.5	5.9	7.0	16.7	20.6
P	Adiponectin	18.8	51.2	9.4	13.6	29.1	35.5
S	AFP	12.2	45.6	6.1	11.8	21.9	26.0
P	Alanine	14.7	55.8	7.4	14.4	26.6	31.6
S	* Alanine aminotransferase	19.4	41.6	9.7	11.5	27.5	34.1
S	* Albumin	3.2	4.75	1.6	1.4	4.1	5.2
U	* Albumin	35	35	17.5	12.4	41.2	53.1
U	Albumin: Creatinine Ratio	30.5	32.5	15.3	11.1	36.3	46.7
S	Aldosterone	29.4	40.1	14.7	12.4	36.7	46.7
U	* Aldosterone concentration, 24 h	39.4	40.1	19.7	14.1	46.6	60.0
S	* Alkaline phosphatase	6.45	26.1	3.2	6.7	12.0	14.2
S	Alkaline phosphatase, bone	6.2	37.4	3.1	9.5	14.6	16.7
U	* Aminolevulinic Acid	16	27	8.0	7.8	21.0	26.5
U	Ammonia output, 24 h	24.7	27.3	12.4	9.2	29.6	38.0
S	* Androstendione	15.8	38.8	7.9	10.5	23.5	28.9
S	Anion Gap	9.5	10.1	4.8	3.5	11.3	14.5
P	Antiplasmin activity	6.2		3.1			
P	Antithrombin III	5.2	15.3	2.6	4.0	8.3	10.1
S	Apolipoprotein A1	6.5	13.4	3.3	3.7	9.1	11.3
S	Apolipoprotein B	6.9	22.8	3.5	6.0	11.6	14.0
S	Ascorbic Acid (Vitamin C)	26.0	31.0	13.0	10.1	31.6	40.4
P	* Ascorbic Acid (Vitamin C)	20	21	10.0	7.3	23.8	30.6

		BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
	ANALYTE	CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
P	Asparagine	12.3	28.0	6.2	7.6	17.8	22.0
S	* Aspartate aminotransferase	12.3	23.1	6.2	6.5	16.7	20.9
P	Aspartic Acid	31.2	55.1	15.6	15.8	41.6	52.2
P	Arginine	19.3	34.1	9.7	9.8	25.7	32.3
S	α-Tocopherol	13.8	15.0	6.9	5.1	16.5	21.2
S	β2-Microglobulin	5.9	15.5	3.0	4.1	9.0	11.0
B	Basophils, count	28.0	54.8	14.0	15.4	38.5	48.0
S	β-Globulins	10.1	9.1	5.1	3.4	11.7	15.2
S	Bilirubin, conjugated	36.8	43.2	18.4	14.2	44.5	57.1
S	Bilirubin, total	23.8	39.0	11.9	11.4	31.1	39.1
S	C Peptide	16.6	23.2	8.3	7.1	20.8	26.5
S	C3 complement	5.2	15.6	2.6	4.1	8.4	10.2
S	C4 complement	8.9	33.4	4.5	8.6	16.0	19.0
S	CA 125	24.7	54.6	12.4	15.0	35.4	43.8
S	CA 15.3	6.1	62.9	3.1	15.8	20.8	22.9
S	* CA 19.9	15.95	131	8.0	32.9	46.0	51.4
S	CA 549	9.1	33.4	4.6	8.7	16.2	19.3
S	* Calcium	2.1	2.5	1.1	0.8	2.5	3.3
U	* Calcium	26.2	27	13.1	9.4	31.0	39.9
S	* Calcium, Ionized	1.7	1.9	0.9	0.6	2.0	2.6
S	Carbohydrate deficient transferrin	7.1	38.7	3.6	9.8	15.7	18.1
S	Carcinoembryonic antigen (CEA)	12.7	55.6	6.4	14.3	24.7	29.1
S	* Carnitine, Free	8.05	16.7	4.0	4.6	11.3	14.0
S	* Carnitine, Total	8.85	11.8	4.4	3.7	11.0	14.0
P	* Carotene	18	48	9.0	12.8	27.7	33.8
S	* Carotene	36	39.7	18.0	13.4	43.1	55.3
B	CD4	25.0		12.5			
S	Ceruloplasmin	5.8	11.1	2.9	3.1	7.9	9.9
S	Chloride	1.2	1.5	0.6	0.5	1.5	1.9
S	* Cholesterol	5.95	15.3	3.0	4.1	9.0	11.0
S	Cholinesterase	6.1	18.2	3.1	4.8	9.8	11.9
P	Chromogranin A	12.8	26.3	6.4	7.3	17.9	22.2
P	Citrulline	21.4	43.9	10.7	12.2	29.9	37.1
S	CK MB, activity	19.7	24.3	9.9	7.8	24.1	30.8
S	* CK MB, mass	18.4	56.6	9.2	14.9	30.1	36.3
P	Copper	8.0	19.0	4.0	5.2	11.8	14.5
S	Copper	4.9	13.6	2.5	3.6	7.7	9.3
S	* Cortisol	20.9	45.6	10.5	12.5	29.8	36.9
P	* Cortisol	21.7	46.2	10.9	12.8	30.7	38.0
S	C-Reactive protein	42.2	76.3	21.1	21.8	56.6	71.0
S	* CRP, High Sensitive	49.7	89.2	24.9	25.5	66.5	83.4
S	Creatine kinase	22.8	40.0	11.4	11.5	30.3	38.1
S	Creatinine	6.0	14.7	3.0	4.0	8.9	11.0
U	* Creatinine	11	23	5.5	6.4	15.4	19.2
S	* C-telopeptide (CTx)	10.85	30.6	5.4	8.1	17.1	20.8
S	Cyfra 21.1	22.2	31.1	11.1	9.6	27.9	35.4
S	Cystatin C	5	13.0	2.5	3.5	7.6	9.3

		BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
	ANALYTE	CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
P	Cystatin C	5.5		2.8			
P	Cystine	38.3	48.5	19.2	15.4	47.0	60.1
P	* D-dimer	23.3	26.5	11.7	8.8	28.0	36.0
S	* Dehydroepiandrosterone sulfate	6.35	30.7	3.2	7.8	13.1	15.2
U	* Deoxypyridinoline/creatinine, 24h	15.35	30.3	7.7	8.5	21.2	26.4
P	* Elastase	12.4	15.1	6.2	4.9	15.1	19.3
B	Eosinophils, count	21.0	76.4	10.5	19.8	37.1	44.3
B	* Erythrocytes, count	3.25	6.3	1.6	1.8	4.5	5.6
S	Estradiol	22.8	24.4	11.4	8.3	27.2	34.9
U	Estradiol	30.4		15.2			
U	Estradiol, free	38.6		19.3			
P	Factor V	3.6		1.8			
P	Factor VII	6.8	19.4	3.4	5.1	10.7	13.1
P	Factor VIII	4.8	19.1	2.4	4.9	8.9	10.5
P	* Factor X	5.35		2.7			
S	Ferritin	14.2	15.0	7.1	5.2	16.9	21.7
P	Fibrinogen	10.7	15.8	5.4	4.8	13.6	17.2
S	* Folate	24	73	12	19.2	39.0	47.2
B	* Folate	12	66	6	16.8	26.7	30.8
S	* Follicle stimulating hormone	11	47.2	5.5	12.1	21.2	24.9
S	Free thyroxine (FT4)	5.7	12.1	2.9	3.3	8.0	10.0
S	Free triiodothyronine (FT3)	7.9	17.6	4.0	4.8	11.3	14.0
S	Fructosamine	3.4	5.9	1.7	1.7	4.5	5.7
S	Globulins, total	5.5	12.9	2.8	3.5	8.0	9.9
S	* Glucose	5.6	7.5	2.8	2.3	7.0	8.9
P	Glucose	4.5	5.8	2.3	1.8	5.5	7.1
B	Glucose-6-Phosphate Dehydrogenase	32.8	31.8	16.4	11.4	38.5	49.6
P	Glutamic Acid	46.4	79.9	23.2	23.1	61.4	77.2
P	Glutamine	12.1	22.0	6.1	6.3	16.3	20.4
B	Glutathione peroxidase	7.2	21.7	3.6	5.7	11.7	14.1
S	Glycated albumin	5.2	10.3	2.6	2.9	7.2	8.9
P	Glycine	11.8	40.3	5.9	10.5	20.2	24.2
S	* HA (Hyaluronic Acid)	62		31.0			
S	Haptoglobin	20.4	36.4	10.2	10.4	27.3	34.2
P	Haptoglobin	20.0	27.9	10.0	8.6	25.1	31.9
P	* HDL cholesterol	7.3	21.2	3.7	5.6	11.6	14.1
S	* HDL cholesterol	7.3	21.2	3.7	5.6	11.6	14.1
B	* Hematocrit	2.7	6.41	1.4	1.7	4.0	4.9
B	* Hemoglobin	2.85	6.8	1.4	1.8	4.2	5.2
B	* Hemoglobin A1C (IFCC)	1.85	5.7	0.9	1.5	3.1	3.7
B	* Hemoglobin A1C (JDS)	1.85	5.7	0.9	1.5	3.0	3.7
B	* Hemoglobin A1C (Mono-S)	1.85	5.7	0.9	1.5	3.0	3.7
B	* Hemoglobin A1C (NGSP)	1.85	5.7	0.9	1.5	3.0	3.7
B	* Hemoglobin A2	0.7	7.7	0.4	1.9	2.5	2.7
S	High Sensitivity C-Reactive protein	42.2	76.3	21.1	21.8	56.6	71.0
P	Histidine	9.7	27.2	4.9	7.2	15.2	18.5

		BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
	ANALYTE	CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
P	* Homocysteine	8.3	33.5	4.2	8.6	15.5	18.3
U	Hydroxyproline	36.1	38.8	18.1	13.2	43.0	55.3
P	Hydroxyproline, Total	34.5	56.7	17.3	16.6	45.1	56.8
S	I-Chains	4.8	18.0	2.4	4.7	8.6	10.2
S	Immunoglobulin A	5.4	35.9	2.7	9.1	13.5	15.4
S	Immunoglobulin G	4.5	16.5	2.3	4.3	8.0	9.5
S	Immunoglobulin M	5.9	47.3	3.0	11.9	16.8	18.8
P	Isoleucine	15.5	45.5	7.8	12.0	24.8	30.1
S	* Inhibin B	10	25	5.0	6.7	15.0	18.4
S	Insulin	21.1	58.3	10.6	15.5	32.9	40.1
S	Insulin-like growth factor I (IGF-I, Somatomedin C)	14.6	45.4	7.3	11.9	24.0	28.9
S	Interleukin-8	24.0	31.0	12.0	9.8	29.6	37.8
S	Interleukin 1-β	30.0	36.0	15.0	11.7	36.5	46.7
S	Iron	26.5	23.2	13.3	8.8	30.7	39.7
S	k-Chains	4.8	15.3	2.4	4.0	8.0	9.6
B	Lactate	27.2	16.7	13.6	8.0	30.4	39.7
S	Lactate dehydrogenase (LDH)	8.6	14.7	4.3	4.3	11.4	14.3
P	Lactoferrin	11.8	23.7	5.9	6.6	16.4	20.4
S	LD1	2.3	8.3	1.2	2.2	4.1	4.8
S	LD2	3.3	2.4	1.7	1.0	3.7	4.9
S	LD3	2.8	3.8	1.4	1.2	3.5	4.4
S	LD4	5.9	5.3	3.0	2.0	6.9	8.9
S	LD5	8	9.6	4.0	3.1	9.7	12.4
S	* LDL cholesterol	7.8	20.4	3.9	5.5	11.9	14.5
P	Leucine	14.8	44.0	7.4	11.6	23.8	28.8
B	* Leukocytes, count	11.45	21.3	5.7	6.0	15.5	19.4
S	* Lipase	32.2	31.8	16.1	11.3	37.9	48.8
S	Lipoprotein (a)	20.8	18.1	10.4	6.9	24.1	31.1
S	* Luteinizing hormone	23	27.4	11.5	8.9	27.9	35.7
B	* Lymphocytes, count	10.2	35.3	5.1	9.2	17.6	21.1
P	Lysine	11.5	38.2	5.8	10.0	19.5	23.4
S	Magnesium	3.6	6.4	1.8	1.8	4.8	6.0
U	* Magnesium	38.3	37.6	19.2	13.4	45.0	58.0
S	Magnesium, ionized	1.9	5.1	1.0	1.4	2.9	3.6
B	* Mean corpuscular hemoglobin (MCH)	1.4	5.2	0.7	1.3	2.5	3.0
B	* Mean corpuscular hemoglobin conc. (MCHC)	1.06	1.2	0.5	0.4	1.3	1.6
B	* Mean corpuscular volume (MCV)	1.4	4.85	0.7	1.3	2.4	2.9
B	Mean platelet volume (MPV)	4.3	8.1	2.2	2.3	5.8	7.3
P	Methionine	14.7	43.4	7.4	11.5	23.6	28.6
U	* Microalbumin	35	35	17.5	12.4	41.2	53.1
B	* Monocytes, count	17.5	49.8	8.8	13.2	27.6	33.6
S	Mucinous carcinoma-associated antigen (MCA)	10.1	39.3	5.1	10.1	18.5	21.9
S	Myeloperoxidase	36.0	30.0	18.0	11.7	41.4	53.7
S	* Myoglobin	17.6	46.3	8.8	12.4	26.9	32.9
B	* Neutrophils, count	17.1	32.8	8.6	9.2	23.4	29.2
B	Norepinephrine	9.5		4.8			

		BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
	ANALYTE	CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
P	Norepinephrine	19.5		9.8			
U	* N-telopeptide	15.5	37.6	7.8	10.2	23.0	28.2
S	NT-proBNP	10.0	16.0	5.0	4.7	13.0	16.4
P	Ornithine	18.4	54.9	9.2	14.5	29.7	35.9
S	Osmolality	1.3	1.2	0.7	0.4	1.5	2.0
P	Osmolality	1.3	1.5	0.7	0.5	1.6	2.0
U	Osmolality	28.3	57.9	14.2	16.1	39.5	49.1
S	* Osteocalcin	6.35	30.9	3.2	7.9	13.1	15.3
U	* Oxalate	42.5	19.9	21.3	11.7	46.8	61.2
S	* PAPP-A	12.6	14	6.3	4.7	15.1	19.4
S	Parathyroid hormone (PTH, intact)	25.9	23.8	13.0	8.8	30.2	39.0
P	* Parathyroid hormone (PTH, intact)	25.3	43.4	12.7	12.6	33.4	42.0
B	pCO2	4.8	5.3	2.4	1.8	5.7	7.4
B	PH	3.5	2.0	1.8	1.0	3.9	5.1
S	Phenylacetate	6.6	25.2	3.3	6.5	12.0	14.2
P	Phenylalanine	9.5	40.6	4.8	10.4	18.3	21.5
S	* Phosphate	8.15	10.8	4.1	3.4	10.1	12.9
U	* Phosphate	18	22.6	9.0	7.2	22.1	28.2
S	Phospholipids	6.5	11.1	3.3	3.2	8.6	10.8
S	PINP (Procollagen type 1 N-terminal Propeptide)	7.4	57.3	3.7	14.4	20.5	23.1
P	Plasminogen	7.7		3.9			
B	Platelets	9.1	21.9	4.6	5.9	13.4	16.5
U	Porphobilinogen	17.0	31.0	8.5	8.8	22.9	28.6
U	Porphyrins, Total	40.0		20.0			
S	* Potassium	4.6	5.6	2.3	1.8	5.6	7.2
U	* Potassium	24.4	22.2	12.2	8.2	28.4	36.7
S	Prealbumin	10.9	19.1	5.5	5.5	14.5	18.2
S	Prolactin	23.0	35.0	11.5	10.5	29.4	37.3
P	* Prolactin	39.2	65.1	19.6	19.0	51.3	64.7
P	Proline	17.0	104.0	8.5	26.4	40.5	46.2
S	Properdin factor B	9.5	11.2	4.8	3.7	11.5	14.7
S	Prostatic specific antigen (PSA)	18.1	72.4	9.1	18.7	33.6	39.7
U	* Protein	35.5	23.7	17.8	10.7	40.0	52.0
P	Protein C	5.8	55.2	2.9	13.9	18.7	20.6
P	Protein S	5.8	63.4	2.9	15.9	20.7	22.7
S	* Protein, total	2.75	4.7	1.4	1.4	3.6	4.6
P	Prothrombin, time	4.0	6.8	2.0	2.0	5.3	6.6
U	* Pyridinoline/creatinine	19.4	23.6	9.7	7.6	23.6	30.2
B	Pyruvate	15.2	13.0	7.6	5.0	17.5	22.7
B	Red cell distribution wide (RDW)	3.5	5.7	1.8	1.7	4.6	5.7
S	Procollagen type 1 n-terminal (PINP)	6.8	18.4	3.4	4.9	10.5	12.8
S	Reticulocyte, count	11.0	29.0	5.5	7.8	16.8	20.6
P	Retinol	6.2	21.0	3.1	5.5	10.6	12.7
S	Retinol	13.6	19.0	6.8	5.8	17.1	21.7
S	Rheumatoid factor	8.5	24.5	4.3	6.5	13.5	16.4
S	SCC	39.4	35.7	19.7	13.3	45.8	59.2
B	Selenium	12.0	14.0	6.0	4.6	14.5	18.6

		BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
	ANALYTE	CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
P	Selenium	12.0	12.0	6.0	4.2	14.0	18.2
P	Serine	12.8	42.8	6.4	11.2	21.7	26.1
S	* Sex hormone binding globulin (SHBG)	13.05	36.4	6.5	9.7	20.4	24.9
S	* Sodium	0.6	0.7	0.3	0.2	0.7	0.9
U	* Sodium	28.7	16.7	14.4	8.3	32.0	41.7
U	Specific Gravity	0.4	1.0	0.2	0.3	0.6	0.7
S	T3-uptake	0.05		0.0			
P	* T3, Total	9.4	18.5	4.7	5.2	12.9	16.1
P	* T4, Free	7.1	9.1	3.6	2.9	8.7	11.2
P	Taurine	30.6	44.0	15.3	13.4	38.6	49.0
S	* Testosterone	9.25	22.1	4.6	6.0	13.6	16.8
P	* Testosterone	12.6	40.8	6.3	10.7	21.1	25.4
U	Testosterone	25		12.5			
S	Testosterone, free	9.3		4.7			
U	Testosterone, free	51.7		25.9			
P	Threonine	17.9	33.1	9.0	9.4	24.2	30.3
S	Thyroglobulin	14.0	39.0	7.0	10.4	21.9	26.7
S	Thyroglobulin antibody	8.5	82	4.3	20.6	27.6	30.5
S	* Thyroid stimulating hormone (TSH)	29.3	48.4	14.7	14.1	38.3	48.3
S	Thyrotropin receptor antibody	4.8		2.4			
S	Thyroxin binding globulin (TBG)	0.09	0.06	0.0	0.0	0.1	0.1
S	Thyroxine (T4)	4.9	10.6	2.5	2.9	7.0	8.6
S	Thyroid peroxidase antibody	11.3	147.0	5.7	36.9	46.2	50.0
S	Tissue polypeptide antigen (TPA)	31.1	63.7	15.6	17.7	43.4	54.0
S	Tissue polypeptide specific antigen (TPA)	36.1	108.0	18.1	28.5	58.3	70.5
U	Total catecholamines, concentration, 24 h	24.0	32.0	12.0	10.0	29.8	38.0
S	Transferrin	3.0	4.3	1.5	1.3	3.8	4.8
S	* Triglyceride	19.9	32.7	10.0	9.6	26.0	32.8
S	* Triiodothyronine (T3)	6.9	12.3	3.5	3.5	9.2	11.6
S	* Troponin-I	14.05	63.8	7.0	16.3	27.9	32.7
P	* Troponin-I	37.1	179	18.6	45.8	76.4	89.0
S	Troponin-T	30.5	90.0	15.3	23.8	48.9	59.3
P	Tryptophan	22.7	153.0	11.4	38.6	57.3	65.0
S	Tumor necrosis factor	43.0	29.0	21.5	13.0	48.4	63.1
P	Tyrosine	10.5	61.0	5.3	15.5	24.1	27.7
S	* Urate	8.6	17.5	4.3	4.9	12.0	14.9
U	* Urate	16.8	14.4	8.4	5.5	19.4	25.1
S	* Urea	8.6	17.5	4.3	4.9	12.0	14.9
U	* Urea concentration	17.4	25.4	8.7	7.7	22.1	28.0
P	Valine	10.6	40.1	5.3	10.4	19.1	22.7
P	Vitamin B1	4.8	12.0	2.4	3.2	7.2	8.8
B	Vitamin B12	15.0	69.0	7.5	17.7	30.0	35.1
B	Vitamin B2	5.8	10.0	2.9	2.9	7.7	9.6
B	* Vitamin B6	14	24	7.0	6.9	18.5	23.3
P	* Vitamin B6	20	34	10.0	9.9	26.4	33.2
P	Vitamin E (α-tocopherol)	7.6	21.0	3.8	5.6	11.9	14.4

		BIOLOGICAL VARIATION		DESIRABLE SPECIFICATIONS			
	ANALYTE	CV _w	CV _b	Imp (%)	Bias (%)	TE _a (%) p<0.05	TE _a (%) p<0.01
U	VMA	22.2	47.0	11.1	13.0	31.3	38.9
S	VLDL cholesterol	27.6		13.8			
P	Von Willebrand factor	2.5	27.3	1.25	6.9	8.9	9.8
P	Von Willebrand factor antigen	5.0	18.0	2.5	4.7	8.8	10.5
S	y-Globulin	14.6	12.3	7.3	4.8	16.8	21.8
S	* y-Glutamyltransferase	13.4	42.2	6.7	11.1	22.1	26.7
P	Zinc	11.0	14.0	5.5	4.5	13.5	17.3
S	Zinc	9.3	9.4	4.7	3.3	11.0	14.1