

EQA round: AKS4/23 - Basic Clinical Chemistry - Serum

Setup: groups - measurement principle; Slovakia; minimal size of the groups n = 5

RoM = robust average	AV = assigned value	D _{max} = acceptable difference
SD = standard deviation	CRV = certified reference value	LL = lower limit
CV = coefficient of variation	CVP = consensus of all participants	UL = upper limit
N _{tot} = total number of the results	CVPG = consensus of the participants' groups	N _{eva} = number of the results assessed
N _{out} = number of the results removed before calculation	U _{AV} = expanded uncertainty of the assigned value (k = 2)	N _{suc} = number of successful results
		S _{rel} = relative success

Test Sample Group	[unit]	RoM	SD	CV [%]	N _{tot}	N _{out}	Comparability					Traceability															
							AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]	AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]					
(22) α-amylase	[μkat/L]				70										0								70	69	99		
Sample A															0								70	69	99		
(0) Not specified		1,3	0,047	3,6	70	0										CRV	1,366	0,039	15%	1,16	1,58		70				
Sample B															0								70	70	100		
(0) Not specified		4,69	0,22	4,8	70	0										CRV	4,79	0,13	15%	4,07	5,51		70				
(35) α-amylase pancreatic	[μkat/L]				15										15	14	93							0			
Sample A															15	15	100							0			
(0) Not specified		0,835	0,03	3,6	15	0	CVP	0,849	0,008	18%	0,696	1,01			15									0			
Sample B															15	14	93							0			
(0) Not specified		3,93	0,11	2,9	15	0	CVP	3,98	0,033	18%	3,26	4,7			15									0			
(32) γ-globulin (elfo)	[-]				7										7	7	100							0			
Sample A															7	7	100							0			
(0) Not specified		0,125	0,012	9,5	7	0	CVP	0,121	0,004	30%	0,084	0,158			7									0			
Sample B															7	7	100							0			
(0) Not specified		0,121	0,01	8,6	7	0	CVP	0,122	0,003	30%	0,085	0,159			7									0			
(10) Albumin	[g/L]				68										68	68	100							0			
Sample A		35,9	1,1	3,1	68		CVP	36,3	0,17	10%	32,6	40			68	68	100							0			
(1) BCG		36	1,1	3,1	66	0									66												
Other					2	0									2												
							2x 2																				
Sample B		38,9	1,4	3,7	68		CVP	39,3	0,18	10%	35,3	43,3			68	68	100							0			
(1) BCG		38,9	1,4	3,6	66	0									66												
Other					2	0									2												
							2x 2																				
(31) Albumin (elpho)	[-]				7										7	7	100								0		
Sample A															7	7	100								0		
(0) Not specified		0,622	0,047	7,6	7	0	CVP	0,648	0,009	15%	0,55	0,746			7										0		
Sample B															7	7	100								0		
(0) Not specified		0,615	0,049	8	7	0	CVP	0,638	0,009	15%	0,542	0,734			7										0		
(21) ALP	[μkat/L]				69										65	62	95								69	67	97
Sample A		4,94	0,31	6,2	69										65	62	95										
(3) IFCC method		4,94	0,31	6,2	69	0												CRV	5,06	0,14	18%	4,14	5,98		69		
(3) IFCC method; (1) Abbott		5,05	0,14	2,8	8	0	CVPG	5,06	0,039	14%	4,35	5,77			8												
(3) IFCC method; (58) Beckman Coulter (AU)		5,13	0,22	4,2	21	0	CVPG	5,13	0,074	14%	4,41	5,85			21												
(3) IFCC method; (60) Roche		4,74	0,19	4	27	0	CVPG	4,63	0,037	14%	3,98	5,28			27												
Other					13	0									9												
							3x 3/12, 4x 3/46, 1x 3/85, 1x 3/162, 4x 3/178																				
Sample B		1,86	0,099	5,3	69										65	62	95								69	68	99
(3) IFCC method		1,86	0,099	5,3	69	0												CRV	1,987	0,058	18%	1,62	2,35		69		
(3) IFCC method; (1) Abbott		1,94	0,067	3,4	8	0	CVPG	1,93	0,018	14%	1,65	2,21			8												

Summary statistics - quantitative results

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							AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]	AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]			
(3) IFCC method; (58) Beckman Coulter (AU)		1,89	0,093	4,9	21	0	CVPG	1,89	0,031	14%	1,62	2,16	21												
(3) IFCC method; (60) Roche		1,8	0,057	3,2	27	0	CVPG	1,77	0,014	14%	1,52	2,02	27												
Other					13	0							9												
							3x 3/12, 4x 3/46, 1x 3/85, 1x 3/162, 4x 3/178																		
(24) ALT	[μkat/L]				72								0										72	71	99
Sample A													0										72	71	99
(0) Not specified		1,11	0,057	5,1	72	0								CRV	1,062	0,026	asym.	0,902	1,29			72			
Sample B													0										72	72	100
(0) Not specified		0,878	0,047	5,3	72	0								CRV	0,827	0,022	asym.	0,702	1,01			72			
(23) AST	[μkat/L]				71								0										71	69	97
Sample A													0										71	69	97
(0) Not specified		3,38	0,14	4,2	71	0								CRV	3,364	0,076	15%	2,85	3,87			71			
Sample B													0										71	71	100
(0) Not specified		2,01	0,079	3,9	71	0								CRV	1,983	0,048	15%	1,68	2,29			71			
(13) Bilirubin total	[μmol/L]				71								0										71	70	99
Sample A		11,3	1,7	15	71								0		CRV	10,8	0,3	26%	7,99	13,7			71	70	99
(2) DCA, DPD		11,3	1,7	15	64	0																	64		
Other					7	0																	7		
							4x 1, 3x 4																		
Sample B		32,4	3	9,3	71								0		CRV	31,69	0,76	26%	23,4	40			71	71	100
(2) DCA, DPD		32,4	3,1	9,5	64	0																	64		
Other					7	0																	7		
							4x 1, 3x 4																		
(9) Total protein	[g/L]				68								0										68	66	97
Sample A													0										68	68	100
(0) Not specified		55,8	1,2	2,1	68	0								CRV	57	1,5	9%	51,8	62,2			68			
Sample B													0										68	66	97
(0) Not specified		61,1	1,4	2,2	68	0								CRV	61,1	1,4	9%	55,6	66,6			68			
(26) CK	[μkat/L]				67								0										67	66	99
Sample A													0										67	67	100
(0) Not specified		1,84	0,11	5,9	67	0								CRV	2,012	0,05	20%	1,6	2,42			67			
Sample B													0										67	66	99
(0) Not specified		3,17	0,15	4,7	67	0								CRV	3,417	0,083	20%	2,73	4,11			67			
(2) Potassium	[mmol/L]				69								0										69	68	99
Sample A		3,88	0,083	2,1	69								0		CRV	3,868	0,059	7%	3,59	4,14			69	68	99
(2) Indirect ISE		3,87	0,085	2,2	56	0																	56		
(3) Direct ISE		3,88	0,057	1,5	12	0																	12		
Other					1	0																	1		
							1x 99																		
Sample B		3,64	0,074	2	69								0		CRV	3,619	0,064	7%	3,36	3,88			69	69	100
(2) Indirect ISE		3,64	0,075	2,1	56	0																	56		
(3) Direct ISE		3,64	0,063	1,7	12	0																	12		
Other					1	0																	1		
							1x 99																		

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							AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]	AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]	
(5) Inorganic phosphate	[mmol/L]				63							63	61	97			0						
Sample A												63	62	98			0						
(1) UV-molybdate method		1,44	0,041	2,8	63	0	CVP	1,44	0,006	10%	1,29	1,59	63										
Sample B												63	62	98			0						
(1) UV-molybdate method		1,03	0,026	2,5	63	0	CVP	1,02	0,004	10%	0,918	1,13	63										
(27) gamma-GT	[µkat/L]				69											69	69	100					
Sample A												0				69	69	100					
(0) Not specified		6,12	0,18	2,9	69	0								CRV	6,28	0,15	21%	4,96	7,6	69			
Sample B												0				69	69	100					
(0) Not specified		1,98	0,051	2,6	69	0								CRV	2,052	0,053	21%	1,62	2,49	69			
(16) Glucose	[mmol/L]				72							0				72	66	92					
Sample A		7,04	0,22	3,1	72							0		CRV	7,296	0,073	8%	6,71	7,88	72	67	93	
(1) GOD photometry		7,11	0,33	4,6	22	0															22		
(3) Method with hexokinase		7,02	0,17	2,4	49	0															49		
Other					1	0															1		
														1x 2									
Sample B		5,37	0,16	2,9	72							0		CRV	5,542	0,055	8%	5,09	5,99	72	70	97	
(1) GOD photometry		5,46	0,22	3,9	22	0															22		
(3) Method with hexokinase		5,34	0,13	2,4	49	0															49		
Other					1	0															1		
														1x 2									
(7) Magnesium	[mmol/L]				65							0				65	63	97					
Sample A		0,899	0,027	3	65							0		CRV	0,881	0,018	15%	0,748	1,02	65	63	97	
(2) Photometry		0,901	0,028	3,1	57	0															57		
(4) UV enzyme method		0,885	0,022	2,5	8	0															8		
Sample B		1,21	0,025	2,1	65							0		CRV	1,191	0,023	15%	1,01	1,37	65	65	100	
(2) Photometry		1,21	0,028	2,3	57	0															57		
(4) UV enzyme method		1,21	0,03	2,5	8	0															8		
(3) Chloride	[mmol/L]				69							69	69	100			0						
Sample A		105	2,2	2,1	69		CVP	106	0,37	7%	98,5	114	69	69	100			0					
(3) Indirect ISE		105	2,1	2	56	0							56										
(4) Direct ISE		105	2,3	2,2	12	0							12										
Other					1	0							1										
														1x 2									
Sample B		101	2	2	69		CVP	102	0,37	7%	94,8	110	69	69	100			0					
(3) Indirect ISE		101	1,7	1,7	56	0							56										
(4) Direct ISE		101	2,7	2,7	12	0							12										
Other					1	0							1										
														1x 2									
(15) Cholesterol	[mmol/L]				67							0				67	66	99					
Sample A												0				67	67	100					
(0) Not specified		3,4	0,11	3,4	67	0								CRV	3,4	0,037	9%	3,09	3,71	67			
Sample B												0				67	66	99					
(0) Not specified		4,15	0,12	2,8	67	0								CRV	4,145	0,041	9%	3,77	4,52	67			

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							AV	U _{AV}	D _{max}	LL	UL				AV	U _{AV}	D _{max}	LL	UL						
(30) Cholinesterase	[μkat/L]				25							25	23	92								0			
Sample A												25	23	92								0			
(0) Not specified		110	4,7	4,3	25	0	CVP	111	1,2	12%	97,6	125													
Sample B												25	23	92								0			
(0) Not specified		117	4,6	3,9	25	0	CVP	118	1,2	12%	103	133													
(19) Creatinine	[μmol/L]				71																	71	56	79	
Sample A		41,7	4,1	9,8	71									CRV	39,88	0,4	13%	34,6	45,1		71	56	79		
(1) Jaffe		43,2	3,6	8,4	39	0																			39
(3) Enzyme		39,5	2,6	6,6	32	0																			32
Sample B		88,3	3,6	4,1	71									CRV	88,27	0,88	13%	76,7	99,8		71	69	97		
(1) Jaffe		89,7	4,2	4,7	39	0																			39
(3) Enzyme		86,9	2,7	3,1	32	1																			32
(17) Uric acid	[μmol/L]				68																	68	68	100	
Sample A																						68	68	100	
(0) Not specified		303	9,5	3,1	68	0								CRV	299,1	3	12%	263	335		68				68
Sample B																						68	68	100	
(0) Not specified		545	13	2,4	68	0								CRV	532,6	5,3	12%	468	597		68				68
(12) Lactate	[mmol/L]				33							33	32	97											0
Sample A		1,5	0,05	3,3	33		CVP	1,51	0,012	15%	1,28	1,74		33	33	100									0
(1) UV enzyme method		1,49	0,059	4	13	0								13											
(3) Photometric enzyme method		1,51	0,047	3,1	19	0								19											
Other					1	0								1											
							1x 2																		
Sample B		2,95	0,11	3,7	33		CVP	2,96	0,017	15%	2,51	3,41		33	32	97									0
(1) UV enzyme method		2,92	0,13	4,5	13	0								13											
(3) Photometric enzyme method		2,97	0,082	2,8	19	0								19											
Other					1	0								1											
							1x 2																		
(28) LD	[μkat/L]				55																	55	54	98	
Sample A																						55	54	98	
(0) Not specified		2,43	0,11	4,6	55	0								CRV	2,42	0,057	18%	1,98	2,86		55				55
Sample B																						55	54	98	
(0) Not specified		4,95	0,19	3,9	55	0								CRV	4,87	0,11	18%	3,99	5,75		55				55
(29) Lipase	[μkat/L]				34							31	29	94											0
Sample A		0,605	0,046	7,6	34							31	30	97											0
(0) Not specified; (58) Beckman Coulter (AU)		0,619	0,024	3,8	11	0	CVPG	0,61	0,014	24%	0,463	0,757		11											
(0) Not specified; (60) Roche		0,613	0,02	3,3	14	0	CVPG	0,61	0,006	24%	0,463	0,757		14											
Other					9	0								6											
							1x 0/1, 1x 0/12, 3x 0/116, 1x 0/162, 2x 0/178, 1x 0/179																		
Sample B		1,9	0,15	7,8	34							31	30	97											0
(0) Not specified; (58) Beckman Coulter (AU)		1,92	0,025	1,3	11	0	CVPG	1,91	0,024	24%	1,45	2,37		11											
(0) Not specified; (60) Roche		1,94	0,12	6,1	14	0	CVPG	1,96	0,019	24%	1,48	2,44		14											
Other					9	0								6											
							1x 0/1, 1x 0/12, 3x 0/116, 1x 0/162, 2x 0/178, 1x 0/179																		

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							AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]	AV	U _{AV}	D _{max}	LL	UL	N _{eva}	N _{suc}	S _{rel} [%]	
Sample B		2,46	0,065	2,6	66							0		CRV	2,441	0,037	8%	2,24	2,64	66	66	100	
(2) Phot. with o-cresolftalexon		2,48	0,059	2,4	6	0														6			
(3) Photom. with arsenazo III		2,45	0,069	2,8	38	0														38			
(4) Photomet. with NM-BAPTA		2,47	0,061	2,5	21	0														21			
Other					1	0														1			
														1x 99									
(36) Calcium ionised	[mmol/L]				10							10	10	100									0
Sample A												10	10	100									0
(2) Direct ISE		1,78	0,053	3	10	0	CVP	1,77	0,016	10%	1,59	1,95											0
Sample B																							0
(2) Direct ISE		1,64	0,052	3,2	10	0	CVP	1,62	0,01	10%	1,45	1,79											0
(6) Iron	[µmol/L]				61								61	61	100								0
Sample A		18,8	0,51	2,7	61		CVP	19	0,089	15%	16,1	21,9											0
(2) Method with ferrozine/ferene		18,9	0,49	2,6	45	0							45										
(4) Method with TPTZ		18,6	0,39	2,1	16	0							16										
Sample B		27,2	0,68	2,5	61		CVP	27,3	0,1	15%	23,2	31,4		61	61	100							0
(2) Method with ferrozine/ferene		27,3	0,58	2,1	45	0							45										
(4) Method with TPTZ		26,8	0,96	3,6	16	0							16										