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Last day of analysis:
03.11.2023

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This report contains:
- This letter
- Summary
- Individual results

Approved by MP
23.11.2023

Next rounds:
19.02.2024
13.05.2024
30.09.2024

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HIL-index and interference, program no. 4131 EQA report no. 3 2023

The quality assurance program HIL-index and interference examines both preanalytical, analytical and postanalytical conditions.
Preanalytical conditions: determination of haemolysis (H), icterus (I) og lipemia (L) called the HIL-index in the distributed samples. Is the determination of the HIL-index comparable among the groups of instruments?
Analytical: comparison of the analysis results of 6 components between a 'normal' sample without the interference (Sample A) and a sample with added interference (Sample B). In this distribution the interference caused by icterus is examined.
Postanalytical: sharing of the comments accompanying a result to the relevant department, had this been a patient sample with inference outside of the allowable level.

The number of participants

Results from 118 sample sets have been reported in this round.

Control material

The two samples A and B are from similar serum pools except Sample B is added intralipid and sample A is added the same amount of water.

Statistics

Target values and tolerance intervals

The target values in the graphics for the 'normal' components, H-index and I-index are the mean value of all the participants' analysis results for Sample A and this is indicated with M. Sample B's target value is the same as for Sample A and is indicated with R; any deviation from R is a measure of interference, if the deviation is larger than what is observed for Sample A.
For the L-index, both the target values for Sample A and Sample B are marked with R, and it is calculated as mean of means for all manufactures with more than 3 participants.
The background for the tolerance intervals and a guide to reading the report is found at deks.dk:
https://deks.dk/en/products/information-about-the-danish-products/hil-index-3121-dk/

Outliers

Outliers are defined as results lying further from the average of all the results than 3.2 SD (standard deviation). This time, 16 outliers are found; Cholesterol: 2, Creatinine: 3, Ferritin: 2, Potassium: 1, LDH: 1, Phosphate: 2.
For the hemolytic index, 1 outlier is found, for the lipemic index and at the icteric index, 4 outliers are found.

Overview of manufacturer and method groups

Manufacturer and method group results for all 'normal' components, the H-index, the I-index and the L-index are found at the pages "summary report" prior to the individual results in the report.

Results and comments

Preanalytical

Graphics

There are graphics for the lipemic index, for the haemolytic and for the icteric indexes. These can be seen in the graphic part with your individual results.

Unit conversions

Note: Results which are not entered in the primary unit for the hemolytic index, for the icteric index or for the lipaemic index are recalculated to enable the comparison. The primary unit for hemolytic index is g/L, for the icteric index it is µmol/L and for the lipaemic index it is g/L

If unit conversion is performed, it will be noted below the histogram as either:

"Own result: 19 mg/dL = 0,19 g/L"
Stating that DEKS has made a recalculation from mg/dL to g/L,

or as:
*"Own result: 24 [*mg/dL] = 0,24 g/L"*
Meaning that DEKS has assumed that your entered unit is false, and it has been substituted with mg/dL followed by a recalculation to g/L.

For results given as an index value, the middle of the interval is chosen as the converted value.

Important: if you agree in the substitution, please change your method information (metodeoplysninger) in DEKSonline, so it will be correct next time. If you do not agree, please contact DEKS and let us know.

Uncertainty of results and tolerance intervals at lower concentrations

When results are reported as index values it gives a higher uncertainty to the converted values.
When a concentration of an (H-, I-, L-)index is truncated, either by the instrument or the LIS, the result's uncertainty increases. E.g. for the I-index some laboratories report only whole numbers (1, 2, 3 etc.) with the unit mg/dL, which at low concentration means that the result is associated with a large uncertainty, simply due to the rounding.
In both cases and at lower concentrations the uncertainty of the result may be large in relation to the tolerance interval.
In those specific cases laboratories should be more lenient and allow for greater deviations. The same effect is not pronounced at higher concentrations, so no lenience is recommended in those cases.

Lipemic index

For the lipemic index the graphical part shows a refence value, which is the "Reference target" seen in summary report for method groups. This applies for both Sample A and Sample B.

Table 1a. *The lipemic index for each method group of Sample B. Difference% is the difference from the 'reference target'. Pink numbers indicates a difference higher than 15%, the suggested tolerance limit.*

Method group	Result g/L	Difference %	number, n	Outlier
Reference target	**9,02**		118	
Alinity	8,82	-2,2	25	0
Architect	8,83	-2,1	6	0
Atellica	9,38	4,0	19	0
AU series	5,7	-36,8	1	0
Cobas c-modul	9,03	0,11	64	0
Dimension Vista	5	-44,6	2	0
Vitros	8	-11,3	1	0

The ‘difference %’ is calculated from the “Reference target”. “Reference target” = ‘mean of means of all manufactory groups, larger than 3 participants’. Results for the method groups can be found in summary report prior to the individual graphical part.
For sample B the most important results are shown in Table 1a.

For Sample B good agreement is seen between most groups in table 1.
The tolerance interval for the lipemic index is 15%. This is not met for 2 out of 7 method groups (pink text) but as the target value is calculated as an average of manufacturers’ levels, it is subject to some uncertainty, and it is unknown which is the true level.
The same pattern is also seen at Sample A, but considering the lower concentration, high percentual differences are to be expected.

***Table 1b**. The hemolytic index for each method group of sample A and Sample B. Difference in % is the difference between Sample A and B. The number n is for results reported for sample B. Pink numbers indicates a difference higher than 5%, the suggested tolerance limit.*

H-index				
	Sample A [g/L]	Sample B [g/L]	Difference %	Number, n based on Sample B
All	0,0602	0,208	246	115
Alinity	0,0569	0,00964	-83,1	25
Architect	0,0625	0,02	-68,0	4
Atellica	0,0693	0,388	460	19
AU series	0,06	0,25	317	1
Cobas c-modul	0,059	0,237	302	64
Dimension Vista	0,05	0,38	660	2

Hemolytic index

Ideally Sample A and Sample B should be measured to the same concentration. However, as seen previously for the hemolytic index, there is an interference effect on the hemolytic index due to the lipemic interference. However, it should be noted that the concentration is very low, although for some of the most hemolysis-sensitive analyses might be flagged as being affected by this falsely elevated H-index (i.e. ASAT).
Deviations at low concentrations leads to high relative deviations in percent.

Icteric index

For the icteric index almost all manufactures have negative interference from the lipemia on the icteric index. This is consistent with previous observations.
Deviations at low concentrations leads to high relative deviations in percent.

***Table 1c**. The icteric index for each method group of sample A and Sample B. Difference in % is the difference between Sample A and B. The number n is for results reported for sample B. Purple numbers indicates a difference higher than 12%, the suggested tolerance limit.*

I-index				
	Sample A [µmol/L]	Sample B [µmol /L]	Difference %	Number, n based on Sample B
All	14,43	3,2	-77,8	113
Alinity	14,77	1,041	-93,0	25
Architect	14,95	1,15	-92,3	4
Atellica	13,43	5,62	-58,2	19
AU series	18,8	29,1	54,8	1
Cobas c-modul	14,12	3,04	-78,5	64
Dimension Vista	17,1		-	2
Vitros	34,2	0	-	1

Analytical

Components with interference

In this round interference is found in 3 out of 6 components. The components are cholesterol, creatininium and phosphate where interference is seen with Intralipid, see table 2. We recommend the participants in the relevant method groups to follow up on individual results in concern to internal procedure.

Cholesterol

For cholesterol positive interference above the tolerance limit is seen for 2 method groups. For all groups, the degree of negative interference is similar to the interference seen in 2022, when the lipemic concentration was similar (9,3 g/L). However positive interference is seen this time for Atellica, where none was seen in 2022.

Creatinium

For Creatinin 1 out of 8 method groups are affected with interference and exceed the tolerance limit. As mentioned in earlier reports, it is critical in connection to creatinine's application for the determination of eGFR.

Phosphate

For 4 of the 6 groups have interference above the tolerance limit. This was seen previously for Atellica and Allinity. For Architect the previously seen interference at a similar level of interference was positive, now its negative

Components without interference

Estimated by the average of the method groups, there was no interference for ferritin, potassium and Lactatdehydrogenase (LD, LDH) in regards to the tolerance limits.

Ferritin

As seen in the graphic part and in table 2, systematic differences are seen between the major method groups. The reason for this is not known. The difference is seen in both samples, so it's not related to the addition of Intralipid (and no interference is seen).

The results from all components can be found in "summary report" which can be found before the laboratory specific graphics in this report.

__Table 2.__ Components with or without interference. Difference in % is the difference between sample A and B. The number n is for results reported for sample B. Red figures indicates that the tolerance limits have been exceeded:

Cholesterol					
	Sample A [mmol/L]	Sample B [mmol/L]	Difference %	Number, n based on Sample B	Tolerance limit %
All	4,49	4,65	3,6	106	5
Alinity	4,51	4,83	7,1	23	
Architect	4,59	4,86	5,9	5	
Atellica	4,42	4,46	0,90	18	
AU series	4,74	4,87	2,7	1	
Cobas c-modul	4,49	4,61	2,7	58	
Dimension Vista	4,42			1	
Vitros	4,5	4,6	2,2	1	

Creatininium					
	Sample A [µmol/L]	Sample B [µmol/L]	Difference %	Number, n based on Sample B	Tolerance limit %
All	71,7	70,1	-2,2	111	8
Abbott	70,6	69	-2,3	25	
Architect	71,4	64,3	-9,9	6	
Atellica	68,8	63,3	-8,0	19	
Beckman Coulter AU	72	69	-4,1	1	
Cobas c-modul	73,4	73,7	0,41	52	
Cobas c-modul, Jaffe	71,7	72,7	1,39	5	
Dimension Vista	72,5	68,5	-5,5	2	
Vitros	66	66	0	1	

Ferritin					
	Sample A [µg/L]	Sample B [µg/L]	Difference %	Number, n based on Sample B	Tole-rance li-mit %
All	136,8	136,7	-0,07	95	15
Alinity	123,9	119,4	-3,6	20	
Architect	118,3	114,7	-3,0	4	
Atellica	93,9	96,8	3,1	12	
AU series	134	127	-5,2	1	
Cobas c-modul	158,2	152,5	-3,6	12	
Cobas e-modul	151,7	154,5	1,8	43	
Dimension Vi-sta	137	138	0,7	1	
TOSOH AIA	104,4	101,7	-2,6	1	
Vitros	126	133	5,6	1	

Lactatdehydrogenase(LD, LDH)					
	Sample A [U/L]	Sample B [U/L]	Difference %	Number, n based on Sample B	Tole-rance limit %
All	197,6	201	1,7	105	11,4
Alinity	195,2	195	-0,10	22	
Architect	193,4	197,7	2,2	6	
Atellica	199,3	205	2,9	18	
AU series	169			1	
Cobac c-modul	198,7	201	1,16	56	
Dimension Vi-sta	214	225	5,1	1	
Vitros 5,1 FS	198	201	1,5	1	

Phosphate					
	Sample A [mmol/L]	Sample B [mmol/L]	Difference %	Number, n based on Sample B	Tole-rance limit %
All	1,069	0,98	-8,3	101	6
Alinity	1,055	0,985	-6,6	21	
Architect	1,064	0,962	-9,6	5	
Atellica	1,092	0,661	-39,5	16	
AU series	1,07	1,13	5,6	1	
Cobas c-modul	1,064	1,066	0,19	56	
Dimension Vi-sta	1,26	1,13	-10,3	1	

Potasium-ion					
	Sample A [mmol/L]	Sample B [mmol/L]	Difference %	Number, n based on Sample B	Tole-rance limit %
All	8,03	8,06	0,37	114	5,6
Alinity	8	8,05	0,66	25	
Architect	7,92	7,95	0,38	6	
Atellica	7,94	7,97	0,38	19	
Beckman Coul-ter AU	7,82	7,77	-0,64	1	
Cobas c-modul	8,06	8,11	0,62	37	
Cobas ISE-mo-dul	8,1	8,11	0,12	23	
Dimension Vi-sta	8,3	8,15	-1,8	2	
Vitros 5,1	8,1	8,2	1,23	1	

Postanalytical

For mutual inspiration and to strengthen the post-analytical part, we continue to encourage all participants to share their potential comments to the clinicians (the comments that would have accompanied the result of an analysis request).
We recommend that you look at your own results and compare them to any comments made, especially in relation to your own tolerance limits.

In appendix 1, the comments for clinicians can be seen. This time 96 comments have been reported.

Cholesterol

27 results are outside the tolerance limits, but only 8 comments are received, see table 2.
27 laboratories *should have* included a comment but did not. They are therefore having a general risk of releasing an answer that are falsely high or low in a true clinical situation. A few laboratories did give a comment, where the degree of interference did not exceed the tolerance limit.

Creatinium

Those participants using an Architect instrument, where a comment was shared, are correct: Interference is present in a level outside the tolerance limit.

Those with comments about lipemia using other instruments, are in risk of falsely withholding a useful result.
But there are some variations within the instruments groups, so verify if your own result for Sample B is within the tolerance limit or not. If its within, then no comment should have been made. If its outside, then a comment should have been made.

Ferritin
5 laboratories made comments with concerns about icterus, though no large interferences are seen.

Lactatedehydrogenase (LDH, LD)
Most laboratories did correctly not include a comment regarding LDH. 22 laboratories did comment on lipemic interference on LDH even though the interference was lower than the tolerance limit. In a true clinical situation there is a risk of falsely withholding a useful result.

Potassium
12 comments were received, albeit no interference is present.

Phosphate
20 comments were received, most of which correctly are from the four method groups that do have a negative interference effect larger that the tolerance limit. Some laboratories with other methods did however give a comment where none was needed. It should be noted that a spread is present inside the groups, so some laboratories are correct in not returning a comment, while others should have returned a comment. You can see if you are correct in not returning a comment, by looking if your result for Sample B is within the tolerance limits.

End of report

Questions and comments to this scheme are always welcome to Sanne Schou: sanne.schou@deks.dk or Morten Pedersen: morten.pedersen@deks.dk

Kind regards

Sanne Schou and Morten Pedersen

Appendix 1 Postanalytical

The laboratories' comments to the clinicians, shown here for mutual inspiration, as there are differences in the way hemolytic test results are handled.

The following comments have accompanied the result of an analysis request.

COMPONENT	Answer to the clinician sample B	INSTRUMENT	DEKS No
Cholesterol	B: Ikke udført, prøven lipæmisk	Atellica	14
	HILB svar afgives som lipædemi	Vitros 5,1 FS	33
	B: Kan ikke udføres pga. lipæmi	Atellica	58
	Sample B- highly lipemic.	Atellica	684
	no interferences	Cobas 8000/c 702	714
	B - Result blocked due to high icteria, lipemia. Sample B- highly lipemic.	Dimension EXL 200	725
	Analysesvaret er falskt for lavt,inntil 10% for lavt,pga høy bilikons. i prøven.	Alinity	2553
	Kommenteres med "Lipemi påvist. Kolesterol kan være påvirket.	Atellica	2604
Creatininium	HILB svar afgives som lipædemi	Vitros 4600	33
	Havde det været en almindelig prøve, var crea blevet ultracentrifugeret	Alinity	179
	Sample B: Lipemic serum	Cobas 6000/c 501	678
	Sample B- highly lipemic.	Atellica	684
	Sample B is lipemic, gives an uncertain answer	Cobas 8000/c 702	714
	Sample B- highly lipemic.	Dimension EXL 200	725
	Sample B: Crea svar=Kan ikke udføres pga lipæmi	Alinity	750
	Analysen kan ikke utføres pga lipemisk prøve.	Alinity	2552
	Prøven fortynnes til lavere lipemi	Alinity	2553
	Fortynn prøven	Alinity	2554
	Kommentar: "Lipemisk"	Architect	2559
	B. We would not release this answer. Ultra sentrifuge the serum/plasma to separate the fat from it. Analyze the clear serum/plasma again. Still not answer we would write a comment that says: we cannot do the analyzation because of very lipemic sample.	Alinity	2601
	Ultrasentrifugeres og renanalyseres før rapportering.	Atellica	2604
	Alarm om ultrasentrifugering av prøve B	Atellica	2623
	Lipämie (no value reported)	Cobas 8000/c 702	4053
Ferritin	HILB svar afgives som lipædemi	Vitros 5600	33
	Lipemia may influence sample B result	Cobas C 503	546

	Sample B- highly lipemic.	Cobas e 411	684
	no interferences	Cobas 8000/e 801	714
	Sample B- highly lipemic.	Dimension EXL 200	725
	B. We would not release this answer. Ultra sentrifuge the serum/plasma to separate the fat from it. Analyze the clear serum/plasma again. Still not answer we would write a comment that says: we cannot do the analyzation because of very lipemic sample.	Alinity	2601
	Lipämie (no value reported)	Cobas 8000/c 702	4053
	Lipämie und Hämolyse (no value reported)	Cobas 8000/c 702	4053
H - Index	Sample B- highly lipemic.	Atellica	684
	Sample B- highly lipemic.	Dimension EXL 200	725
	Sample B har negativt svar: -0,05	Alinity	2638
	svar prøve B: -0,3 mg/dl	Atellica	7
	Sample B- highly lipemic.	Atellica	684
	Sample B- highly lipemic.	Dimension EXL 200	725
	Sample B har negativt svar: -7,6	Alinity	2638
Potassium-ion	svar prøve B: Ikke udført prøven hæmolyseret	Atellica	7
	HILA = <15, HILB kan ikke måles pga lipæmi	Vitros 5,1 FS	33
	Kalium Lipe. Analyseret på ABL	Atellica	663
	Sample B- highly lipemic.	Atellica	684
	In sample B we report also: Sample slightly hemolytic. Kalium might be incorrectly high.	Cobas 8000/ ISE-modul	693
	no interferences	Cobas 8000/ ISE-modul	714
	B - Result blocked due to high hemolysis, icteria, lipemia. Sample B- highly lipemic.	Dimension EXL 200	725
	Kommentar: "Lipemisk"	Architect	2559
	B. We would normally realease the answer from ABL and not from this instrument because of the very lipemic sample.	Alinity	2601
	Sample B: Kan ikke utgis grunnet lipemisk prøve. Elektrolytter fra blodgass anbefales.	Cobas 8000/ ISE-modul	2602
	Ultrasentrifugeres og renanalyseres før rapportering.	Atellica	2604
	Lipemisk. kan ikke analyseres.	Cobas 6000/c 501	2628
L-Index	HILA = <20, HILB >800	Vitros 5,1 FS	33
	Sample B- highly lipemic.	Atellica	684
	Sample B- highly lipemic.	Dimension EXL 200	725
	4+ på Sample B	Alinity	2638
	Blokeret af hæmolyse på prøve B	Cobas 8000/c 702	3

Lactat-dehydrogenase (LD, LDH)	Svar prøve B: ikke udført, prøven lipæmisk	Atellica	7
	B: Ikke udført, prøven lipæmisk	Atellica	14
	Sample B: svar afleveret: lipæmi	Cobas 6000/c 501	24
	HILA = <15, HILB kan ikke måles pga lipæmi	Vitros 5,1 FS	33
	Prøve B: Lipæmisk	Cobas 8000/c 702	35
	Pr. B: 'Hæmolyse'. Kun forhøjet hæmolyse indeks.	Cobas 8000/c 702	51
	Resultatet bliver tilbage holdt pga. L-index og skal ultracentrifugeres.	Cobas 8000/c 702	54
	B: Kan ikke udføres pga. lipæmi	Atellica	58
	Lipemia may influence sample B result	Cobas C 503	546
	Ingen svari DMS pga hemolyse Svar fra Atellica	Atellica	663
	sample B is slightly hemolytic. results	Cobas 6000/c 501	678
	B - Result blocked due to high lipemia. Sample B- highly lipemic.	Atellica	684
	No interferences. Interferences L-Index > 900.	Cobas 8000/c 702	714
	B - Result blocked due to high icteria, lipemia. Sample B- highly lipemic.	Dimension EXL 200	725
	Sampl B: Hemolyse. Kan gi for høyt resultat.	Cobas 8000/c 702	2602
	Ultrasentrifugeres og renanalyseres før rapportering.	Atellica	2604
	Lipemisk prøve. Usikker resultat.	Cobas C 503	2611
	Hemolyse. Kan gi for høyt resultat.	Cobas 6000/c 501	2628
	Resultat rapporteres ikke pga for høy lipidindex	Cobas c 303	2637
	Seponert pga overskredet lipidindex	Cobas c 303	2637
	Lipämie (no value reported)	Cobas 8000/c 702	4053
Phosphate	svar prøve B: ikke udført, prøven lipæmisk	Atellica	7
	B: Ikke udført, prøven lipæmisk	Atellica	14
	Sample B: svar afleveret: lipæmi	Cobas 8000/c 702	24
	HILB svar afgives som lipædemi	Vitros 5,1 FS	33
	Prøve B: Lipæmisk	Cobas 8000/c 702	35
	Resultatet bliver tilbage holdt pga. L-index og skal ultracentrifugeres.	Cobas 8000/c 702	54
	B: Kan ikke udføres pga. lipæmi	Atellica	58
	Automatic statement for sample B 'Due to high lipaemia in sample, Pi result may be falsely low"	Atellica	278
	Phospat giver Lipe. Prøven ultracentrifugeret nyt svar 0,984	Atellica	663
	B - Result blocked due to high lipemia.Sample B- highly lipemic.	Atellica	684
	Sample B is lipemic, gives an uncertain answer	Cobas 8000/c 702	714
	B - Result blocked due to high hemolysis, icteria, lipemia. Sample B- highly lipemic.	Dimension EXL 200	725
	Prøven fortynnes til lavere lipemi	Alinity	2553

	Fortynn prøven	Alinity	2554
	B. We would not release this answer. Ultra sentrifuge the serum/plasma to separate the fat from it. Analyze the clear serum/plasma again. Still not answer we would write a comment that says: we cannot do the analyzation because of very lipemic sample.	Alinity	2601
	Sample B: Denne prøven ville vi highspeed sentrifu-gert, og analysert om etter fjerning av lipider.	Cobas 8000/c 702	2602
	Ultrasentrifugeres og renanalyseres før rapportering. Ved påvist lipemi kan svaret på fosfat være påvirket/falsk for høyt.	Atellica	2604
	Alarm om ultrasentrifugering av prøve B	Atellica	2623
	Lipemisk prøve. Usikkert resultat.	Cobas 6000/c 501	2628
	Fosfat: kan ikke analyseres pga lipemisk serum (L-INDEX > 800)	Cobas 8000/c 702	2660

Component	Mean	Sd	CV	sem	N	Outliers
P- Cholesterolstofk. Sample 'Gko'						
Alle	4,49	0,0875	1,95	0,0085	106	1
Alinity	4,51	0,0772	1,712	0,01609	23	0
Architect	4,59	0,0496	1,08	0,0222	5	0
Atellica	4,42	0,0762	1,723	0,01795	18	0
AU series	4,74				1	0
Cobas c-modul	4,49	0,0796	1,774	0,01054	57	1
Dimension Vista	4,42				1	0
Vitros	4,5				1	0
P- Cholesterolstofk. Sample 'Hae'						
Reference Target	4,49					
Alle	4,65	0,1511	3,25	0,01467	106	1
Alinity	4,83	0,0915	1,895	0,01907	23	0
Architect	4,86	0,1003	2,06	0,0448	5	0
Atellica	4,46	0,0737	1,651	0,01736	18	0
AU series	4,87				1	0
Cobas c-modul	4,61	0,0784	1,701	0,0103	58	0
Dimension Vista					0	1
Vitros	4,6				1	0
P- Creatininiumstofk. Sample 'Gko'						
Alle	71,7	2,98	4,16	0,283	111	2
Enzymatic	71,9	3,03	4,22	0,306	98	0
Jaffe	70,3	2,21	3,15	0,614	13	2
P- Creatininiumstofk. Sample 'Hae'						
Reference Target	71,7					
Alle	70,1	5,03	7,18	0,477	111	1
Enzymatic	70	5,09	7,28	0,514	98	0
Jaffe	71,2	4,58	6,43	1,269	13	1
P- Ferritinmassek. Sample 'Gko'						
Alle	136,8	22,5	16,43	2,31	95	1
Alinity	123,9	5,33	4,3	1,192	20	0
Architect	118,3	3,77	3,19	1,884	4	0
Atellica	93,9	11,79	12,56	3,4	12	0
AU series	134				1	0
Cobas c-modul	158,2	5,07	3,21	1,465	12	0
Cobas e-modul	151,7	7,11	4,69	1,084	43	1
Dimension Vista	137				1	0
TOSOH AIA	104,4				1	0
Vitros	126				1	0
P- Ferritinmassek. Sample 'Hae'						
Reference Target	136,8					
Alle	136,7	23,1	16,91	2,37	95	1
Alinity	119,4	5,66	4,74	1,266	20	0
Architect	114,7	5,33	4,65	2,67	4	0
Atellica	96,8	12,76	13,18	3,68	12	0
AU series	127				1	0
Cobas c-modul	152,5	7,78	5,1	2,25	12	0
Cobas e-modul	154,5	6,97	4,51	1,062	43	1
Dimension Vista	138				1	0
TOSOH AIA	101,7				1	0
Vitros	133				1	0
P- H - Hæmolyse Index Sample 'Gko'						
Alle	0,0602	0,01486	24,7	0,001386	115	1
Alinity	0,0569	0,01478	26	0,00296	25	0
Architect	0,0625	0,00957	15,32	0,00479	4	0
Atellica	0,0693	0,01292	18,65	0,00296	19	0
AU series	0,06				1	0
Cobas c-modul	0,059	0,01516	25,7	0,001895	64	0
Dimension Vista	0,05	0	0	0	2	0
Vitros					0	1

Component	Mean	Sd	CV	sem	N	Outliers
P- H - Hæmolyse Index Sample 'Hae'						
Reference Target	0,0602					
Alle	0,208	0,1651	79,4	0,01539	115	0
Alinity	0,00964	0,01372	142,3	0,00274	25	0
Architect	0,02	0,01826	91,3	0,00913	4	0
Atellica	0,388	0,1248	32,2	0,0286	19	0
AU series	0,25				1	0
Cobas c-modul	0,237	0,1237	52,1	0,01546	64	0
Dimension Vista	0,38	0	0	0	2	0
P- I - Icterisk Index Sample 'Gko'						
Alle	14,43	5,58	38,7	0,523	114	2
Alinity	14,77	1,517	10,28	0,316	23	2
Architect	14,95	0,545	3,64	0,272	4	0
Atellica	13,43	8	59,5	1,834	19	0
AU series	18,8				1	0
Cobas c-modul	14,12	5,45	38,6	0,681	64	0
Dimension Vista	17,1	0	0	0	2	0
Vitros	34,2				1	0
P- I - Icterisk Index Sample 'Hae'						
Reference Target	14,43					
Alle	3,2	6,97	218	0,656	113	2
Alinity	1,041	1,707	164	0,341	25	0
Architect	1,15	1,109	96,4	0,555	4	0
Atellica	5,62	10,69	190,1	2,45	19	0
AU series	29,1				1	0
Cobas c-modul	3,04	6,16	203	0,771	64	0
Dimension Vista					0	2
P- Kalium-ionstofk. Sample 'Gko'						
Alle	8,03	0,1166	1,452	0,01092	114	0
Alinity	8	0,0911	1,139	0,01822	25	0
Architect	7,92	0,0743	0,938	0,0303	6	0
Atellica	7,94	0,0808	1,017	0,01854	19	0
Beckman Coulter AU	7,82				1	0
Cobas c-modul	8,06	0,1069	1,325	0,01757	37	0
Cobas ISE-modul	8,1	0,0962	1,188	0,0201	23	0
Dimension Vista	8,3	0	0	0	2	0
Vitros 5,1	8,1				1	0
P- Kalium-ionstofk. Sample 'Hae'						
Reference Target	8,03					
Alle	8,06	0,1199	1,487	0,01128	113	1
Alinity	8,05	0,1013	1,259	0,0203	25	0
Architect	7,95	0,0776	0,976	0,0317	6	0
Atellica	7,97	0,0489	0,614	0,01152	18	1
Beckman Coulter AU	7,77				1	0
Cobas c-modul	8,11	0,1232	1,519	0,0203	37	0
Cobas ISE-modul	8,11	0,1046	1,29	0,0218	23	0
Dimension Vista	8,15	0,0707	0,868	0,05	2	0
Vitros 5,1	8,2				1	0
P- L - Lipæmisk Index Sample 'Gko'						
Reference Target	0,17					
Alle	0,217	0,0948	43,6	0,00873	118	0
Alinity	0,16	0,01979	12,37	0,00396	25	0
Architect	0,1417	0,00983	6,94	0,00401	6	0
Atellica	0,1035	0,1425	137,7	0,0327	19	0
AU series	0,217				1	0
Cobas c-modul	0,28	0,0304	10,84	0,0038	64	0
Dimension Vista	0,25	0	0	0	2	0
Vitros	0,2				1	0
P- L - Lipæmisk Index Sample 'Hae'						
Reference Target	9,02					
Alle	8,93	1,085	12,15	0,0999	118	0
Alinity	8,82	0,784	8,89	0,1568	25	0
Architect	8,83	0,1981	2,24	0,0809	6	0
Atellica	9,38	1,908	20,3	0,438	19	0
AU series	5,7				1	0
Cobas c-modul	9,03	0,402	4,45	0,0502	64	0
Dimension Vista	5	0	0	0	2	0
Vitros	8				1	0

Component	Mean	Sd	CV	sem	N	Outliers
P- Lactatdehydrogenase(LD, LDH)kat.k. Sample 'Gko'						
Alle	197,6	9,84	4,98	0,961	105	0
Alinity	195,2	11,59	5,94	2,47	22	0
Architect	193,4	9,74	5,04	3,98	6	0
Atellica	199,3	9,75	4,89	2,3	18	0
AU series	169				1	0
Cobac c-modul	198,7	8,23	4,14	1,099	56	0
Dimension Vista	214				1	0
Vitros 5,1 FS	198				1	0
P- Lactatdehydrogenase(LD, LDH)kat.k. Sample 'Hae'						
Reference Target	197,6					
Alle	201	9,33	4,65	0,919	103	1
Alinity	195	10,4	5,33	2,22	22	0
Architect	197,7	5,44	2,75	2,22	6	0
Atellica	205	8,69	4,25	2,05	18	0
AU series					0	1
Cobac c-modul	201	8,04	3,99	1,084	55	0
Dimension Vista	225				1	0
Vitros 5,1 FS	201				1	0
P- Phosphat(P, uorganisk)stofk. Sample 'Gko'						
Alle	1,069	0,0428	4	0,00426	101	1
Alinity	1,055	0,0251	2,38	0,00547	21	0
Architect	1,064	0,0234	2,2	0,01047	5	0
Atellica	1,092	0,046	4,21	0,0115	16	0
AU series	1,07				1	0
Cobas c-modul	1,064	0,0394	3,7	0,00526	56	1
Dimension Vista	1,26				1	0
Vitros	1,09				1	0
P- Phosphat(P, uorganisk)stofk. Sample 'Hae'						
Reference Target	1,069					
Alle	0,98	0,21	21,5	0,0211	99	1
Alinity	0,985	0,0413	4,2	0,00902	21	0
Architect	0,962	0,049	5,1	0,0219	5	0
Atellica	0,661	0,374	56,5	0,0934	16	0
AU series	1,13				1	0
Cobas c-modul	1,066	0,0435	4,08	0,00592	54	1
Dimension Vista	1,13				1	0
Vitros	1,14				1	0

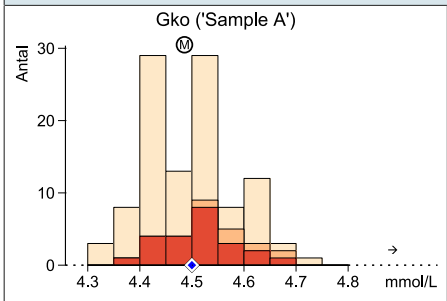
4131 DK - HIL-indeks - EKSEMPEL RAPPORT

Udsendelse 3 - 2023. Laboratorie nr. 500, resultat id. 500

Metodesæt 1 ()

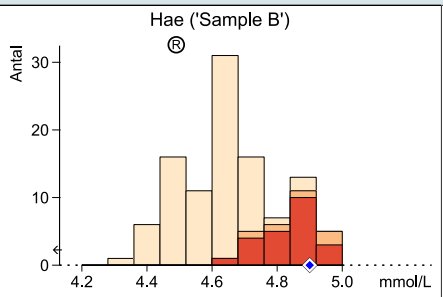
P- Cholesterol{stofk.} -
Producentgruppe: Abbott

Instrument: Alinity
Metodegruppe: Alinity



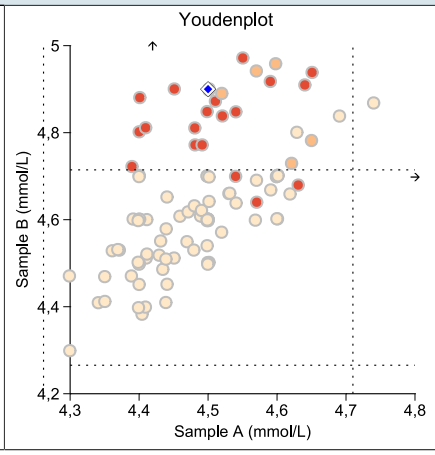
Eget resultat: 4,5 mmol/L (afv. 0,3%)
Middelværdi af alle (M): 4,49 mmol/L
Acceptinterval (M ± 5%): 4,26 - 4,71 mmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	4,52	0,08	1,8	0,0	28
Metodegruppe	4,51	0,08	1,7	0,0	23
Alle	4,49	0,09	2,0	0,0	106



Eget resultat: 4,9 mmol/L (afv. 9,1%)
Referenceværdi (R): 4,49 mmol/L
Acceptinterval (R ± 5%): 4,27 - 4,71 mmol/L

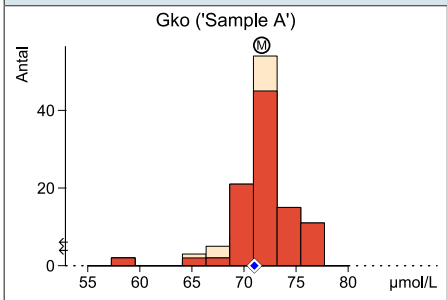
	Middel	sd	CV%	SEM	N
Producentgruppe	4,83	0,09	1,9	0,0	28
Metodegruppe	4,83	0,09	1,9	0,0	23
Alle	4,65	0,15	3,3	0,0	106



Metodesæt 1 ()

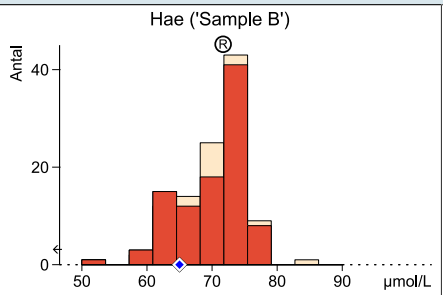
P- Creatininium{stofk.} - NPU18016
Producentgruppe: Atellica

Instrument: Atellica
Metodegruppe: Enzymatic



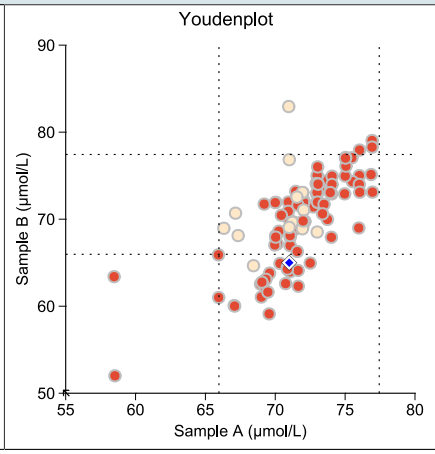
Eget resultat: 71 µmol/L (afv. -1,0%)
Middelværdi af alle (M): 71,7 µmol/L
Acceptinterval (M ± 8%): 66,0 - 77,4 µmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	68,8	4,29	6,2	1,0	19
Metodegruppe	71,9	3,03	4,2	0,3	98
Alle	71,7	2,98	4,2	0,3	111



Eget resultat: 65 µmol/L (afv. -9,3%)
Referenceværdi (R): 71,7 µmol/L
Acceptinterval (R ± 8%): 66,0 - 77,4 µmol/L

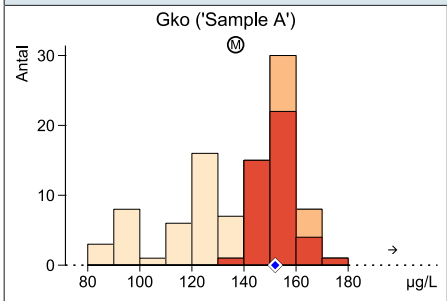
	Middel	sd	CV%	SEM	N
Producentgruppe	63,3	4,38	6,9	1,0	19
Metodegruppe	70,0	5,09	7,3	0,5	98
Alle	70,1	5,03	7,2	0,5	111



Metodesæt 1 ()

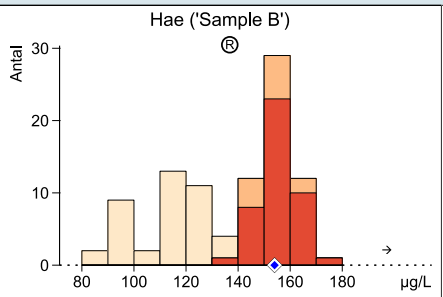
P- Ferritin{massek.} -
Producentgruppe: Roche

Instrument: Cobas 8000/e 801
Metodegruppe: Cobas e-modul



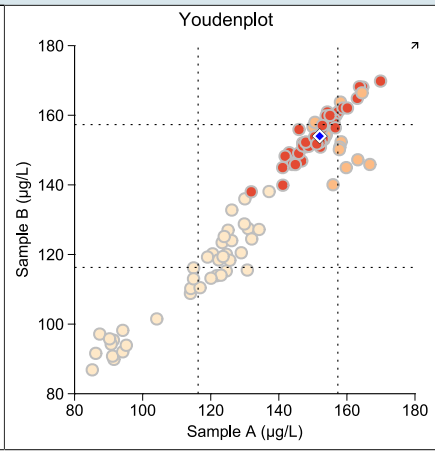
Eget resultat: 152 µg/L (afv. 11,1%)
Middelværdi af alle (M): 136,8 µg/L
Acceptinterval (M ± 15%): 116,3 - 157,3 µg/L

	Middel	sd	CV%	SEM	N
Producentgruppe	153,1	7,20	4,7	1,0	55
Metodegruppe	151,7	7,11	4,7	1,1	43
Alle	136,8	22,48	16,4	2,3	95



Eget resultat: 154 µg/L (afv. 12,6%)
Referenceværdi (R): 136,8 µg/L
Acceptinterval (R ± 15%): 116,3 - 157,3 µg/L

	Middel	sd	CV%	SEM	N
Producentgruppe	154,1	7,12	4,6	1,0	55
Metodegruppe	154,5	6,97	4,5	1,1	43
Alle	136,7	23,11	16,9	2,4	95

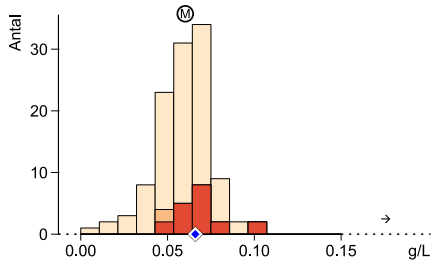


Metodesæt 4 ()

P- H - Hæmolyse Index -
Producentgruppe: Siemens

Instrument: Atellica
Metodegruppe: Atellica

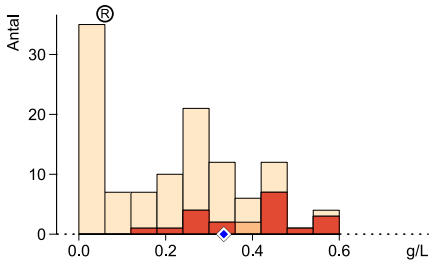
Gko ('Sample A')



Eget resultat: 6,6 mg/dL= 0,066 g/L (afv. 9,6%)
Middelværdi af alle (M): 0,0602 g/L
Acceptinterval (M ± 5%): 0,0572 - 0,0632 g/L

	Middel	sd	CV%	SEM	N
Producentgruppe	0,0675	0,01	20,1	0,0	21
Metodegruppe	0,0693	0,01	18,6	0,0	19
Alle	0,0602	0,01	24,7	0,0	115

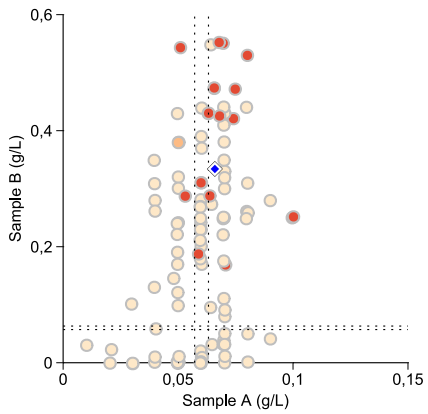
Hae ('Sample B')



Eget resultat: 33,4 mg/dL= 0,334 g/L (afv. 454,8%)
Referenceværdi (R): 0,0602 g/L
Acceptinterval (R ± 5%): 0,0572 - 0,0632 g/L

	Middel	sd	CV%	SEM	N
Producentgruppe	0,387	0,12	30,6	0,0	21
Metodegruppe	0,388	0,12	32,2	0,0	19
Alle	0,208	0,17	79,4	0,0	115

Youdenplot

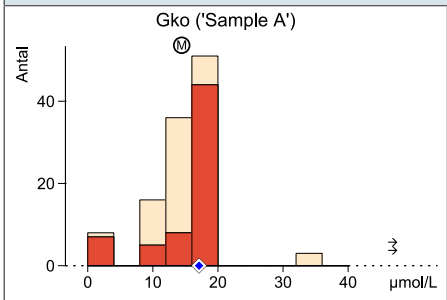


Metodesæt 2 ()

P- I - Icterisk Index -
Producentgruppe: Roche

Instrument: Cobas C 503
Metodegruppe: Cobas c-modul

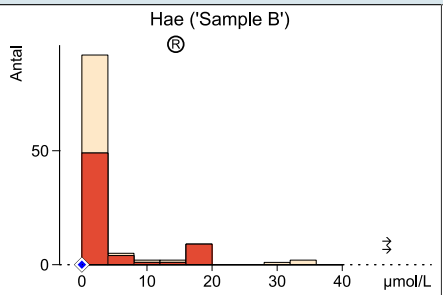
Gko ('Sample A')



Eget resultat: 1 mg/dL= 17,1 µmol/L (afv. 18,5%)
Middelværdi af alle (M): 14,43 µmol/L
Acceptinterval (M ± 12%): 12,70 - 16,16 µmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	14,12	5,45	38,6	0,7	64
Metodegruppe	14,12	5,45	38,6	0,7	64
Alle	14,43	5,58	38,7	0,5	114

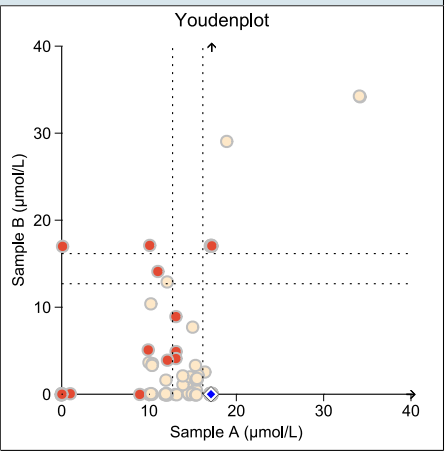
Hae ('Sample B')



Eget resultat: 0 mg/dL= 0 µmol/L (afv. -100,0%)
Referenceværdi (R): 14,43 µmol/L
Acceptinterval (R ± 12%): 12,70 - 16,16 µmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	3,04	6,16	202,5	0,8	64
Metodegruppe	3,04	6,16	202,5	0,8	64
Alle	3,20	6,97	218,0	0,7	113

Youdenplot

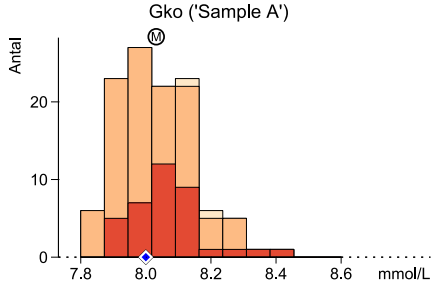


Metodesæt 1 ()

P- Kalium-ion{stofk.} - NPU03230
Producentgruppe: ISE-indirekte

Instrument: Cobas 6000/c 501
Metodegruppe: Cobas c-modul

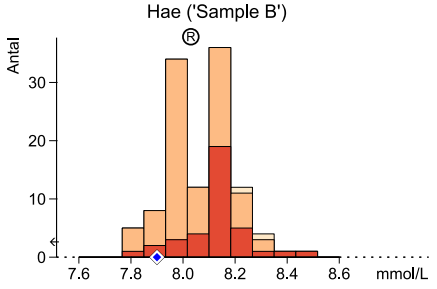
Gko ('Sample A')



Eget resultat: 8 mmol/L (afv. -0,4%)
Middelværdi af alle (M): 8,03 mmol/L
Acceptinterval (M ± 5,6%): 7,58 - 8,48 mmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	8,03	0,12	1,4	0,0	112
Metodegruppe	8,06	0,11	1,3	0,0	37
Alle	8,03	0,12	1,5	0,0	114

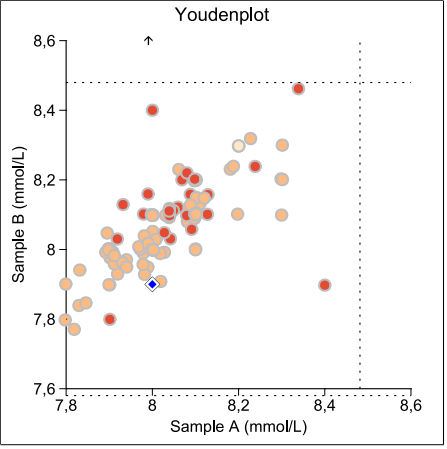
Hae ('Sample B')



Eget resultat: 7,9 mmol/L (afv. -1,6%)
Referenceværdi (R): 8,03 mmol/L
Acceptinterval (R ± 5,6%): 7,58 - 8,48 mmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	8,06	0,12	1,5	0,0	111
Metodegruppe	8,11	0,12	1,5	0,0	37
Alle	8,06	0,12	1,5	0,0	113

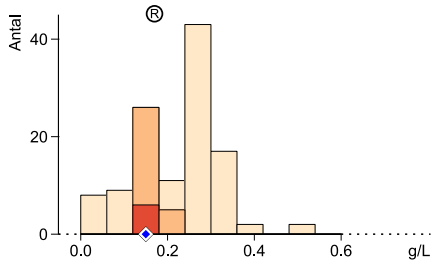
Youdenplot



Metodesæt 1 ()

P- L - Lipæmisk Index -
Producentgruppe: Abbott
Instrument: Architect
Metodegruppe: Architect

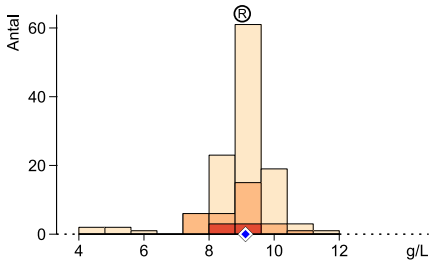
Gko ('Sample A')



Eget resultat: 0,15 [*g/L]= 0,15 g/L (afv. -11,8%)
Referenceværdi (R): 0,17 g/L
Acceptinterval (R ± 15%): 0,1445 - 0,1955 g/L

	Middel	sd	CV%	SEM	N
Producentgruppe	0,1565	0,02	12,5	0,0	31
Metodegruppe	0,1417	0,01	6,9	0,0	6
Alle	0,2175	0,09	43,6	0,0	118

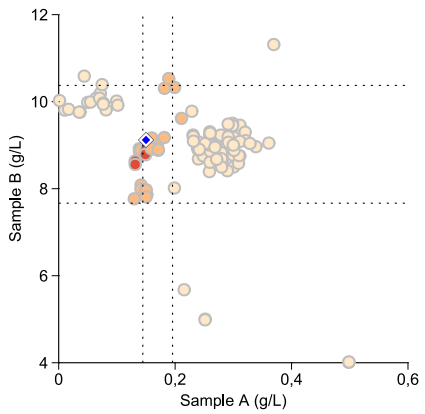
Hae ('Sample B')



Eget resultat: 9,12 [*g/L]= 9,12 g/L (afv. 1,1%)
Referenceværdi (R): 9,02 g/L
Acceptinterval (R ± 15%): 7,67 - 10,37 g/L

	Middel	sd	CV%	SEM	N
Producentgruppe	8,82	0,71	8,0	0,1	31
Metodegruppe	8,83	0,20	2,2	0,1	6
Alle	8,93	1,08	12,2	0,1	118

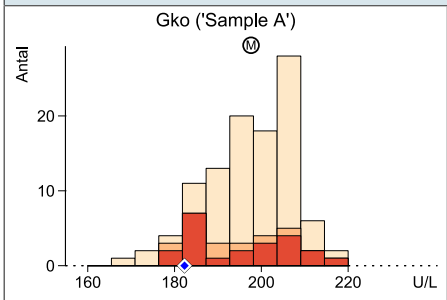
Youdenplot



Metodesæt 1 ()

P- Lactatdehydrogenase(LD, LDH){kat.k.} -
Producentgruppe: Abbott
Instrument: Alinity
Metodegruppe: Alinity

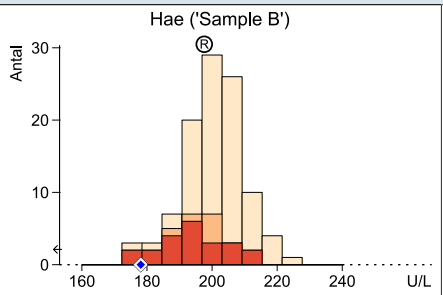
Gko ('Sample A')



Eget resultat: 182,3 U/L (afv. -7,8%)
Middelværdi af alle (M): 197,6 U/L
Acceptinterval (M ± 11,4%): 175,1 - 220,2 U/L

	Middel	sd	CV%	SEM	N
Producentgruppe	194,8	11,08	5,7	2,1	28
Metodegruppe	195,2	11,59	5,9	2,5	22
Alle	197,6	9,84	5,0	1,0	105

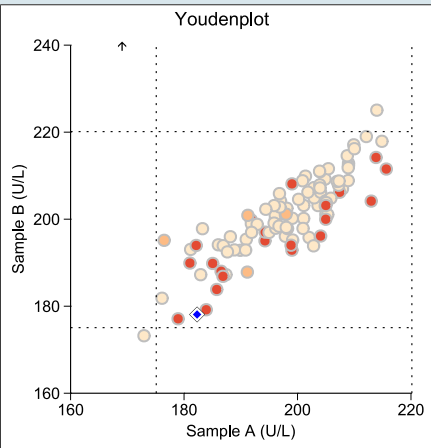
Hae ('Sample B')



Eget resultat: 178,1 U/L (afv. -9,9%)
Referenceværdi (R): 197,6 U/L
Acceptinterval (R ± 11,4%): 175,1 - 220,1 U/L

	Middel	sd	CV%	SEM	N
Producentgruppe	195,5	9,53	4,9	1,8	28
Metodegruppe	195,0	10,40	5,3	2,2	22
Alle	200,6	9,33	4,6	0,9	103

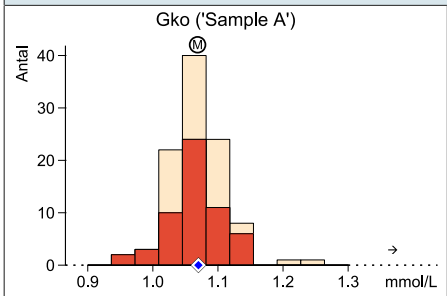
Youdenplot



Metodesæt 1 ()

P- Phosphat(P, uorganisk){stofk.} -
Producentgruppe: Roche
Instrument: Cobas 6000/c 501
Metodegruppe: Cobas c-modul

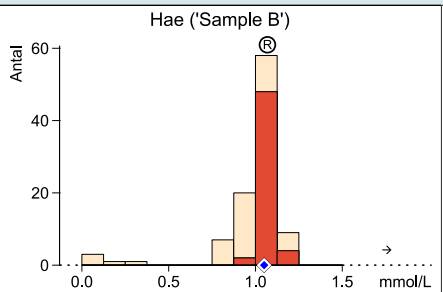
Gko ('Sample A')



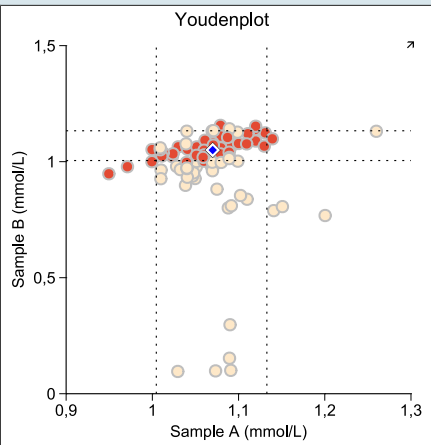
Eget resultat: 1,07 mmol/L (afv. 0,1%)
Middelværdi af alle (M): 1,069 mmol/L
Acceptinterval (M ± 6%): 1,005 - 1,133 mmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	1,064	0,04	3,7	0,0	56
Metodegruppe	1,064	0,04	3,7	0,0	56
Alle	1,069	0,04	4,0	0,0	101

Hae ('Sample B')



Eget resultat: 1,05 mmol/L (afv. -1,8%)
Referenceværdi (R): 1,069 mmol/L
Acceptinterval (R ± 6%): 1,005 - 1,133 mmol/L

	Middel	sd	CV%	SEM	N
Producentgruppe	1,066	0,04	4,1	0,0	54
Metodegruppe	1,066	0,04	4,1	0,0	54
Alle	0,980	0,21	21,5	0,0	99

Youdenplot