LABQUALITY

External Quality Assessment Scheme

Urine quantitative chemistry
Round 1, 2023

Specimens
Please find enclosed a liquid pooled human urine sample S002 à 10 mL.

Caution
Quality control sample derived from human urine must be handled with the same care as patient samples, i.e. as potential transmitters of serious diseases.

Examinations
U-Na, U-K, U-Cl, U-Creatinine, U-P inorganic, U-Urea, U-Uric acid, U-Ca, U-Mg, U-Protein, U-Glucose, U-pH, U-Relative density, U-Osmolality, U-Amylase, U-Albumin and U-Cortisol-Free.

Storage and use
After arrival the sample should be stored at +2…8 °C. The sample is ready for use. Before use allow the sample to reach room temperature (about 1 h) and invert gently at least 1 minute to ensure homogeneity. Opened sample is stable for 4 weeks at +2…8 °C, when stored tightly capped in the original vial.

Result reporting
Please enter the results and methods via LabScala (www.labscala.com). If you cannot find your instrument or reagent from the registry, please contact the EQA Coordinator.

If you get results below (<) or above (>) of your method's detection limit, please mark these results with < or > characters so that the character and your numeric result are typed together without space (eg. <5 or >100). Please do not report "zero" result, if some analyte is not in use in your laboratory, just leave that result field (also the date) empty.

S002

LQ744723012

2023-04-03

INSTRUCTIONS

Product no. 3160
LQ744723012/US

If the kit is incomplete or contains damaged specimens, please report immediately to info@labquality.fi.

The results should be reported no later than **April 25, 2023**.

Inquiries
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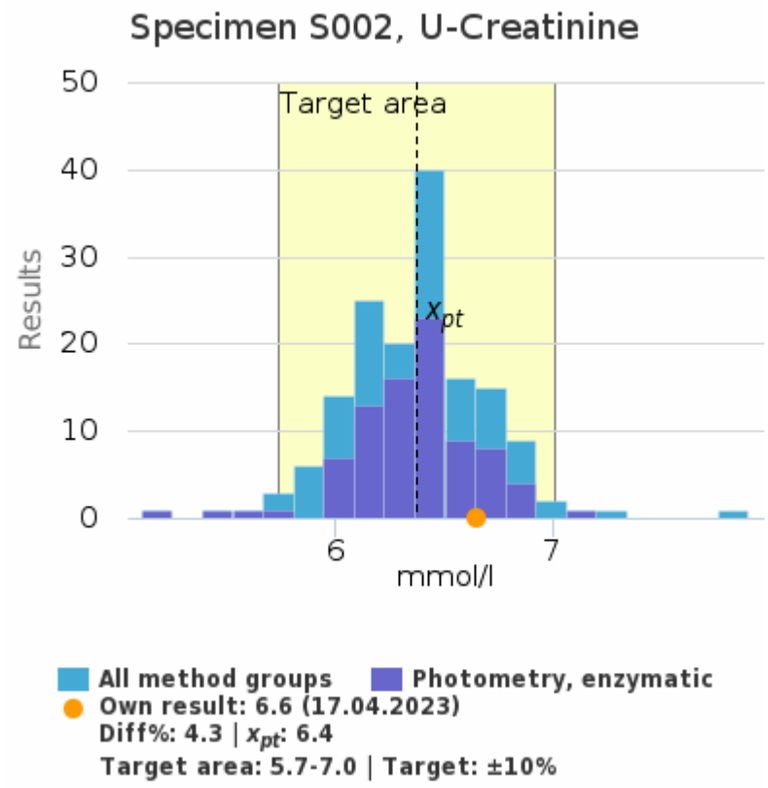
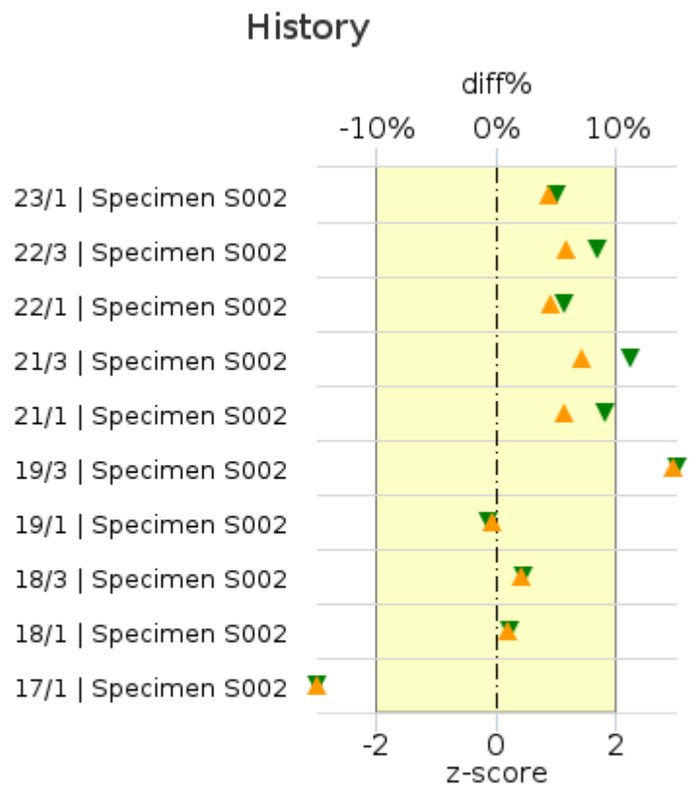
FINAS
Finnish Accreditation Service
PT02 (EN ISO/IEC 17043)

Quality Management
ISO 9001:2015

U-Creatinine |1

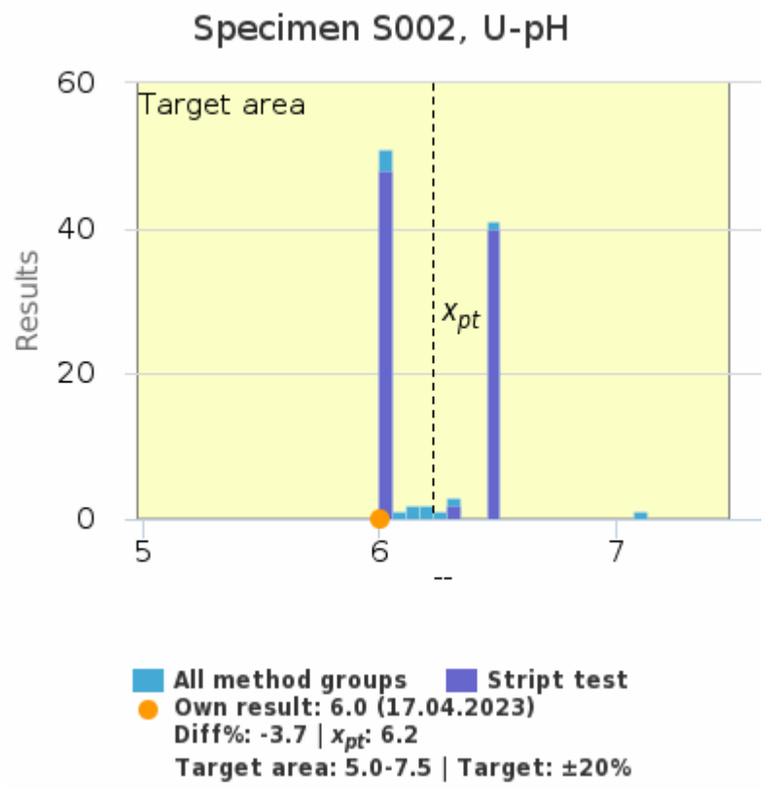


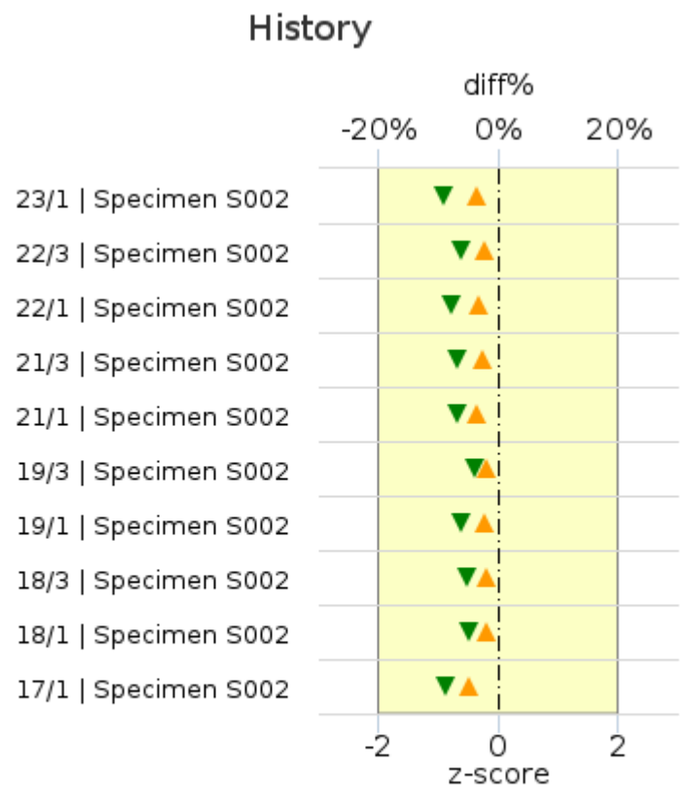


	x_{pt}	sd	SEM	CV%	n
Photometry, enzymatic	6.4 mmol/l	0.3	<0.1	4.2	85
All methods	6.4 mmol/l	0.3	<0.1	4.7	156

Round	Sample	x_{pt}	Result	diff%	z-score
23/1	Specimen S002	6.4	6.6	4.3%	1.01
22/3	Specimen S002	6.7	7.1	5.9%	1.69
22/1	Specimen S002	12.7	13.3	4.5%	1.14
21/3	Specimen S002	17.7	19.0	7.1%	2.25
21/1	Specimen S002	6.5	6.9	5.6%	1.80
19/3	Specimen S002	5.9	56.2	848.2%	155.60
19/1	Specimen S002	11.6	11.6	-0.4%	-0.12
18/3	Specimen S002	9.8	10.0	2.1%	0.46
18/1	Specimen S002	6.0	6.0	1.0%	0.24
17/1	Specimen S002	2.4	1.5	-39.0%	-8.50

U-pH |1

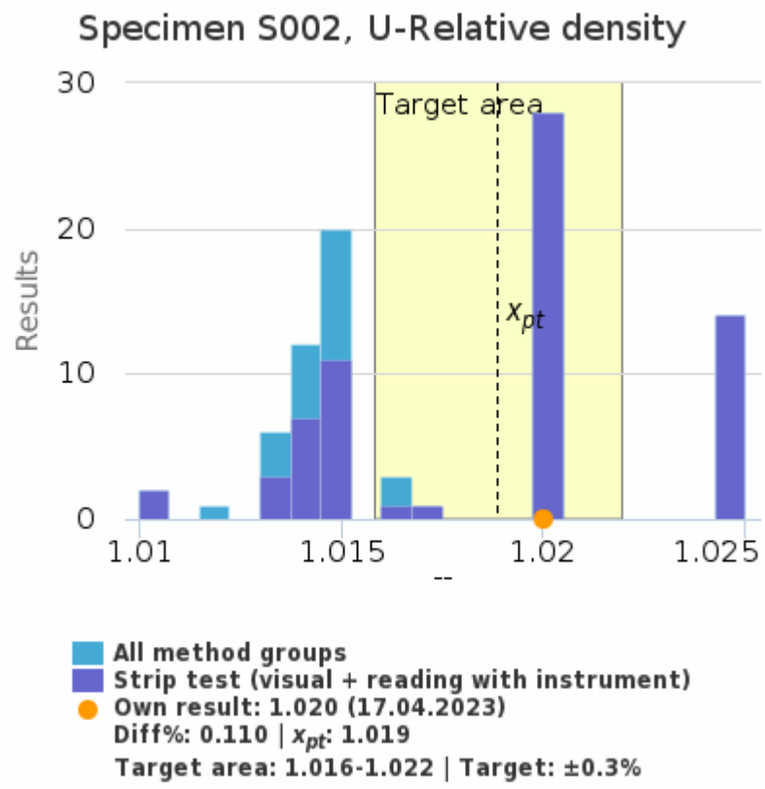


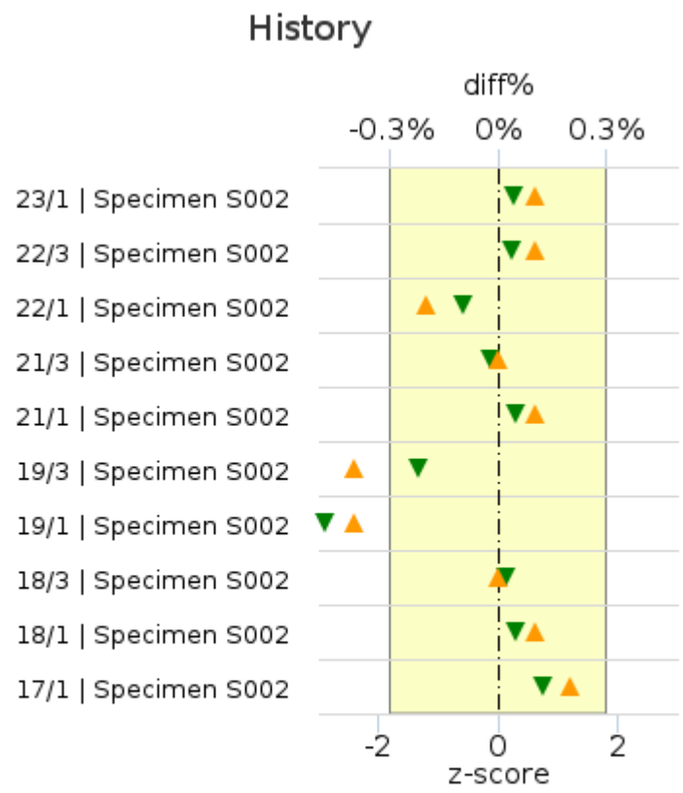


	x_{pt}	sd	SEM	CV%	n
Stript test	6.2 --	0.2	<0.1	4.0	90
All methods	6.2 --	0.2	<0.1	3.8	102

Round	Sample	x_{pt}	Result	diff%	z-score
23/1	Specimen S002	6.2	6.0	-3.7%	-0.92
22/3	Specimen S002	6.1	6.0	-2.2%	-0.61
22/1	Specimen S002	6.2	6.0	-3.1%	-0.78
21/3	Specimen S002	6.2	6.0	-2.7%	-0.68
21/1	Specimen S002	6.2	6.0	-3.6%	-0.68
19/3	Specimen S002	6.1	6.0	-1.8%	-0.38
19/1	Specimen S002	6.1	6.0	-2.4%	-0.62
18/3	Specimen S002	6.1	6.0	-1.9%	-0.51
18/1	Specimen S002	6.1	6.0	-1.9%	-0.49
17/1	Specimen S002	5.3	5.0	-5.0%	-0.87

U-Relative density |1

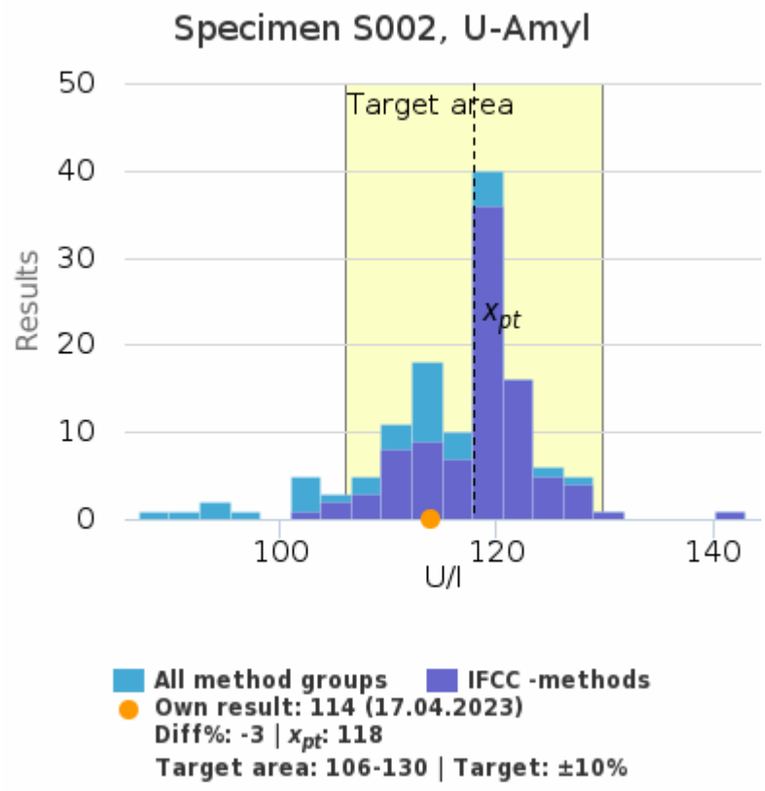


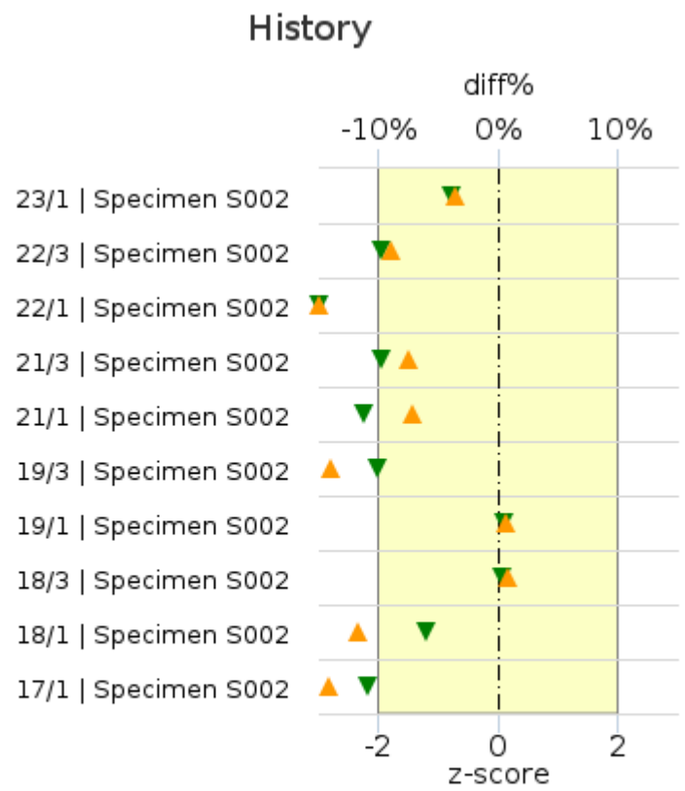


	x_{pt}	sd	SEM	CV%	n
Strip test (visual + reading with instrument)	1.019 --	0.004	<0.001	0.4	67
All methods	1.018 --	0.004	<0.001	0.4	87

Round	Sample	x_{pt}	Result	diff%	z-score
23/1	Specimen S002	1.019	1.020	0.110%	0.27
22/3	Specimen S002	1.019	1.020	0.100%	0.24
22/1	Specimen S002	1.022	1.020	-0.209%	-0.60
21/3	Specimen S002	1.023	1.023	-0.037%	-0.14
21/1	Specimen S002	1.019	1.020	0.122%	0.30
19/3	Specimen S002	1.014	1.010	-0.398%	-1.34
19/1	Specimen S002	1.023	1.015	-0.786%	-2.89
18/3	Specimen S002	1.020	1.020	0.031%	0.14
18/1	Specimen S002	1.014	1.015	0.075%	0.29
17/1	Specimen S002	1.008	1.010	0.222%	0.73

U-Amyl |1

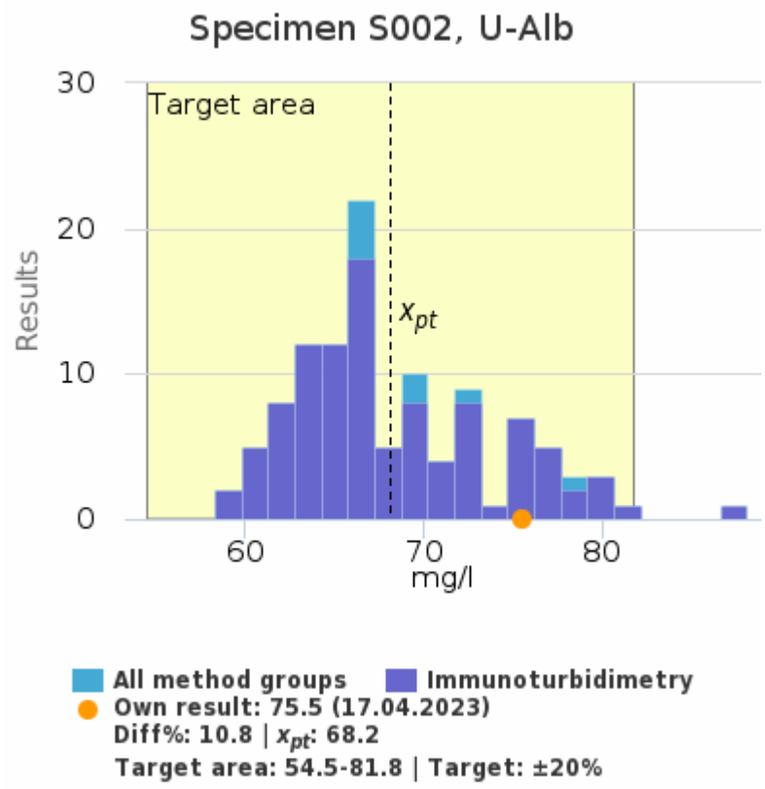


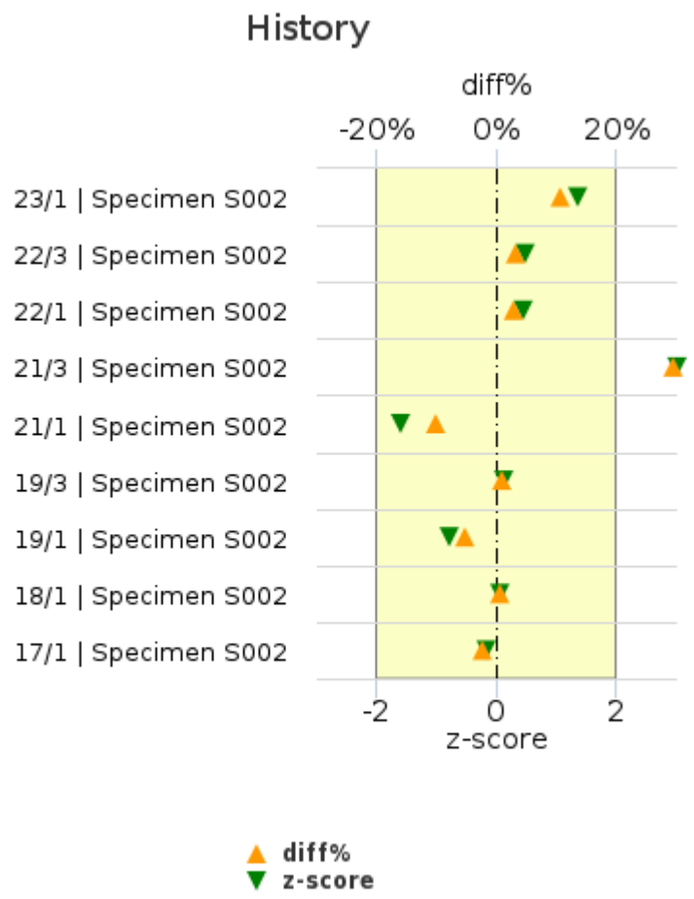


	x_{pt}	sd	SEM	CV%	n
IFCC -methods	118 U/l	5	<1	4.4	93
All methods	117 U/l	6	<1	5.3	126

Round	Sample	x_{pt}	Result	diff%	z-score
23/1	Specimen S002	118	114	-3%	-0.79
22/3	Specimen S002	126	115	-9%	-1.95
22/1	Specimen S002	226	3	-98%	-18.21
21/3	Specimen S002	274	254	-7%	-1.95
21/1	Specimen S002	122	113	-7%	-2.24
19/3	Specimen S002	173	149	-14%	-2.01
19/1	Specimen S002	143	144	1%	0.10
18/3	Specimen S002	343	346	1%	0.05
18/1	Specimen S002	170	151	-12%	-1.19
17/1	Specimen S002	33	28	-14%	-2.18

U-Alb |1





	x_{pt}	sd	SEM	CV%	n
Immunoturbidimetry	68.2 mg/l	5.4	0.5	7.9	102
All methods	68.3 mg/l	5.3	0.5	7.8	110

Round	Sample	x_{pt}	Result	diff%	z-score
23/1	Specimen S002	68.2	75.5	10.8%	1.36
22/3	Specimen S002	65.8	68.1	3.4%	0.48
22/1	Specimen S002	65.5	67.4	3.0%	0.44
21/3	Specimen S002	65.9	97.0	47.2%	6.12
21/1	Specimen S002	65.4	58.9	-9.9%	-1.59
19/3	Specimen S002	171.7	173.3	0.9%	0.14
19/1	Specimen S002	276.6	262.3	-5.2%	-0.79
18/1	Specimen S002	173.1	173.9	0.5%	0.08
17/1	Specimen S002	12.1	11.8	-2.4%	-0.16

Report info

Participants

159 participants from 17 countries.

Report info

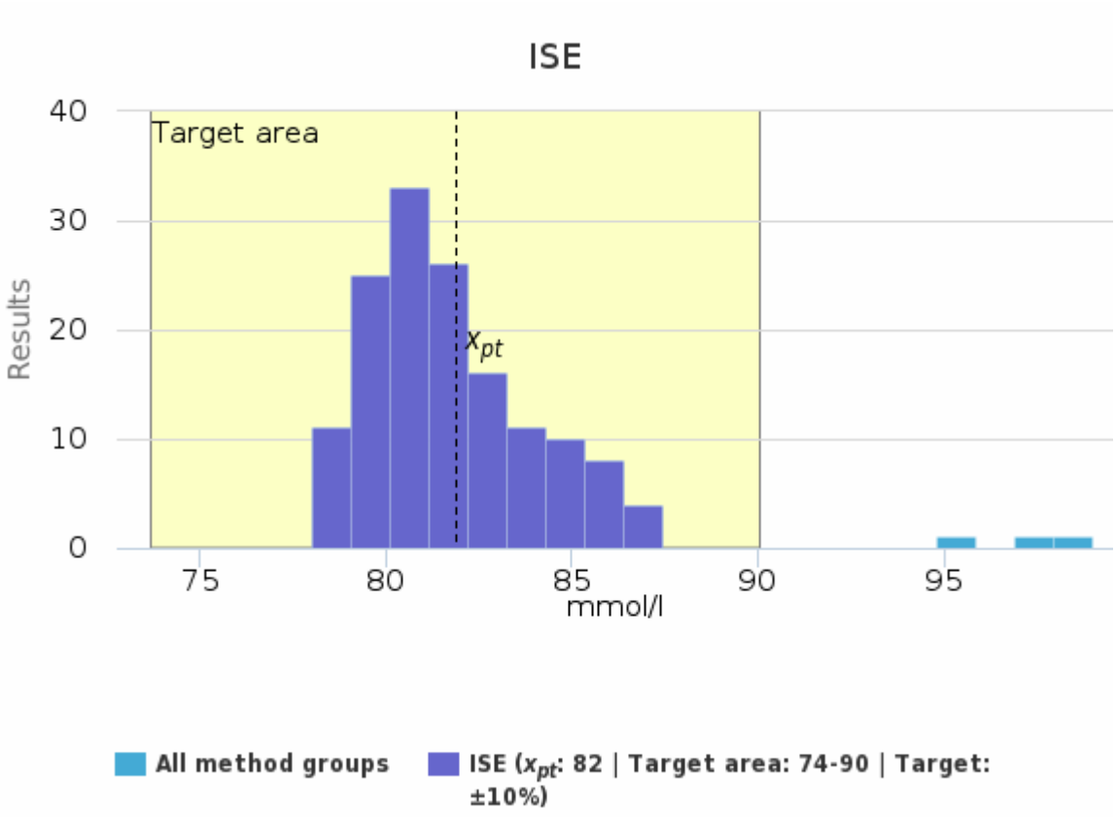
Your own result should be compared to others using the same method.
Assigned values (x_{pt}, target values) are means of the results where results deviating more than +/- 3*standard deviation from the median are removed. The standard uncertainty (u) of the assigned value is reported as standard error of the mean (SEM). Additionally, if the measurement uncertainty of the target value is large an automatic text is printed on the report: “The uncertainty of the assigned value is not negligible, and evaluations could be affected.”
In case the client’s result is the only one in the method group, no assigned value will be calculated, no target area shown, and no statistics calculated. In case there are only a few results in the client’s own method group, the result can be compared to all method mean or to a group that is similar to the own method.
Results reported with < or > -signs cannot be included in the statistics.

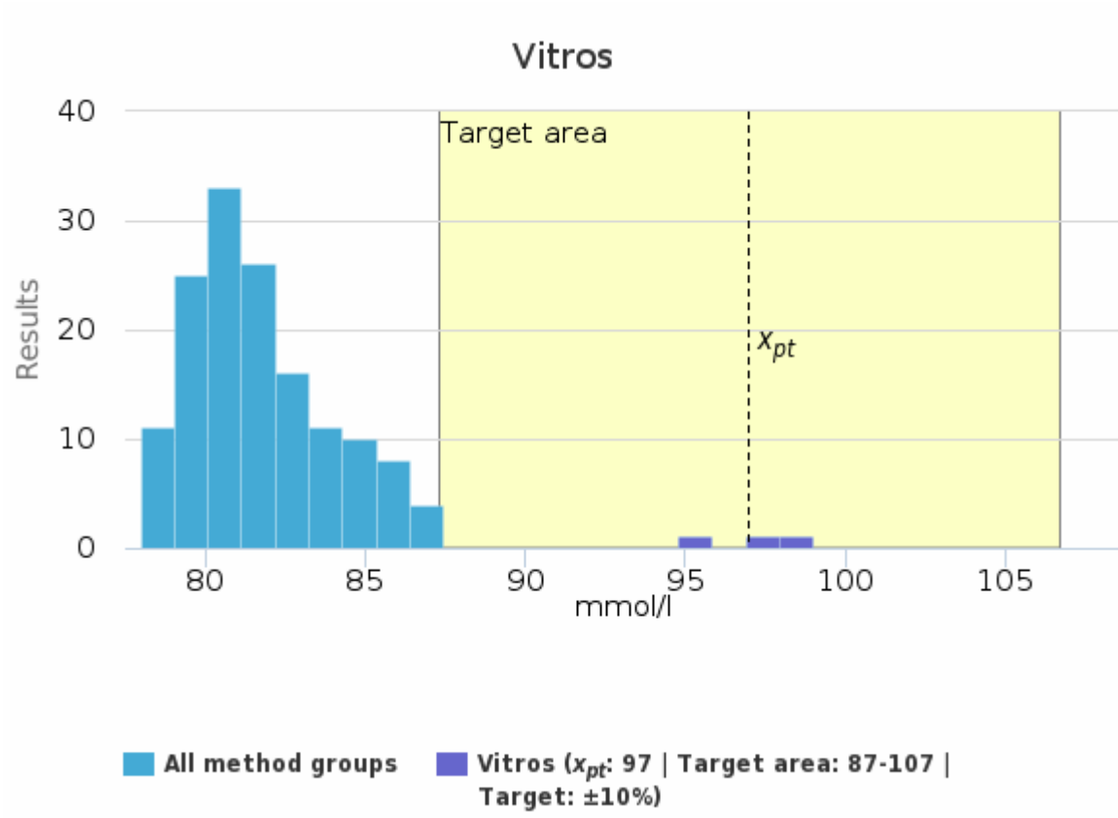
For information on report interpretation and performance evaluation, please see the " EQAS Interpretation guidelines" LabScala User instructions (top right corner ?Help link).

Specimen S002 | U-Na, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
ISE	82	81	2	2.6	<1	78	87	-	144
Vitros	97	97	2	2.1	1	95	99	-	3
All	**82**	**81**	**2**	**2.6**	**<1**	**78**	**87**	**3**	**147**

Specimen S002 | U-Na, mmol/l| histogram summaries in LabScala

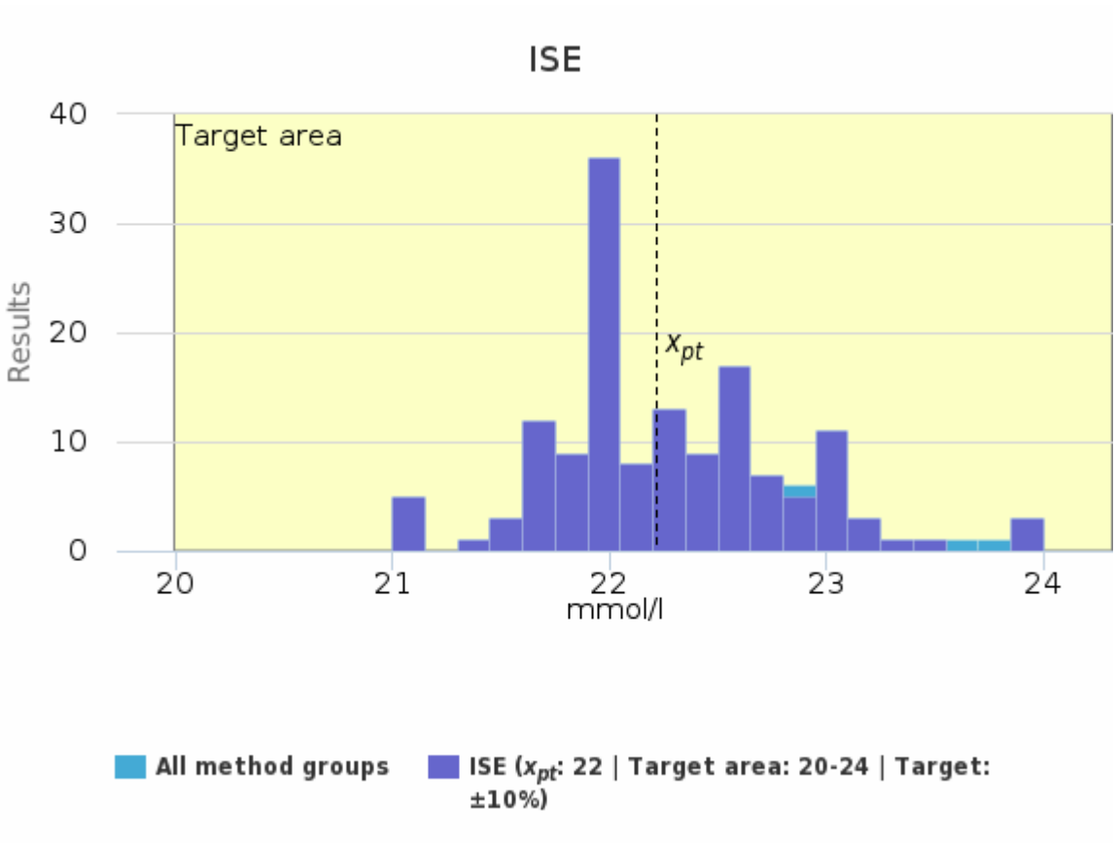


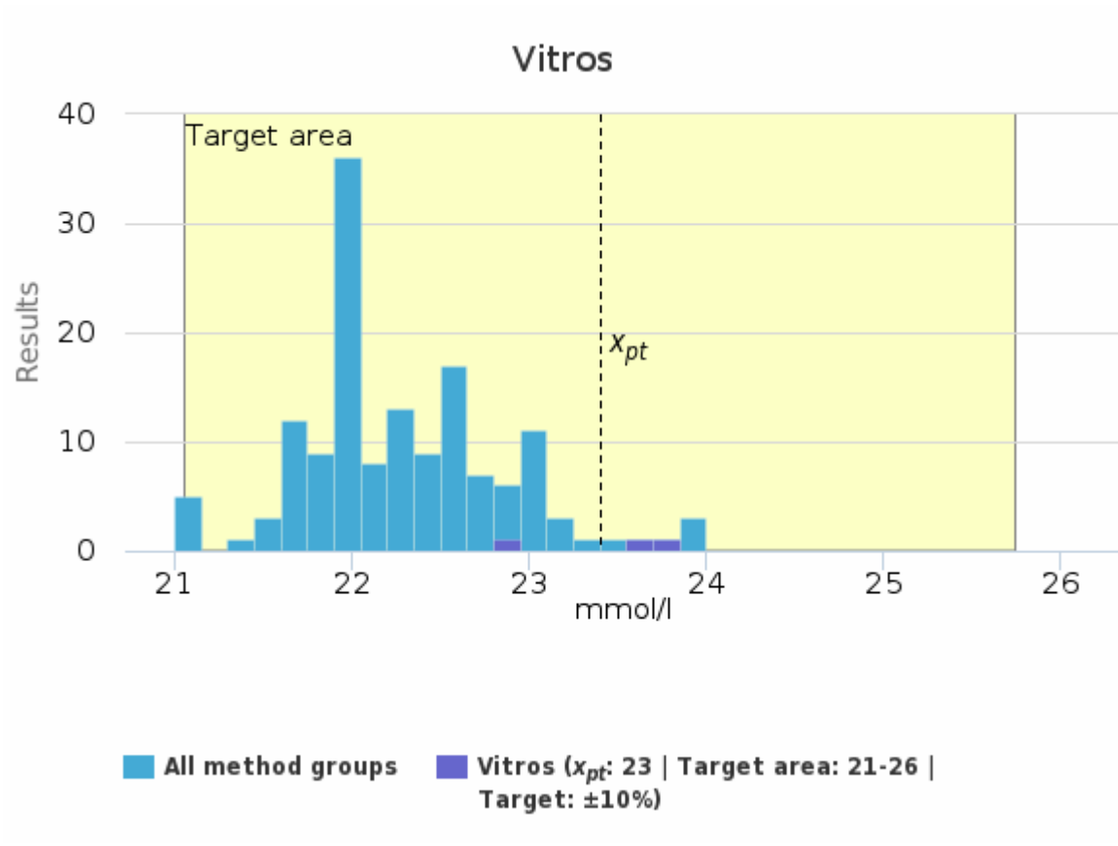


Specimen S002 | U-K, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
ISE	22	22	<1	2.2	<1	21	24	3	144
Vitros	23	24	<1	2.3	<1	23	24	-	3
All	**22**	**22**	**<1**	**2.4**	**<1**	**21**	**24**	**3**	**147**

Specimen S002 | U-K, mmol/l| histogram summaries in LabScala

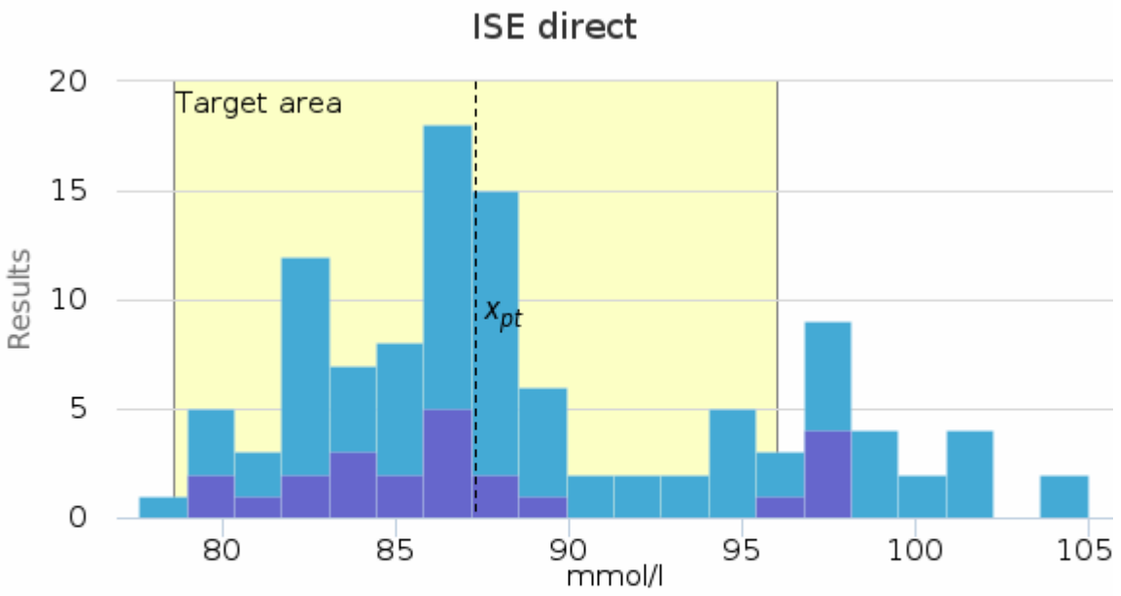


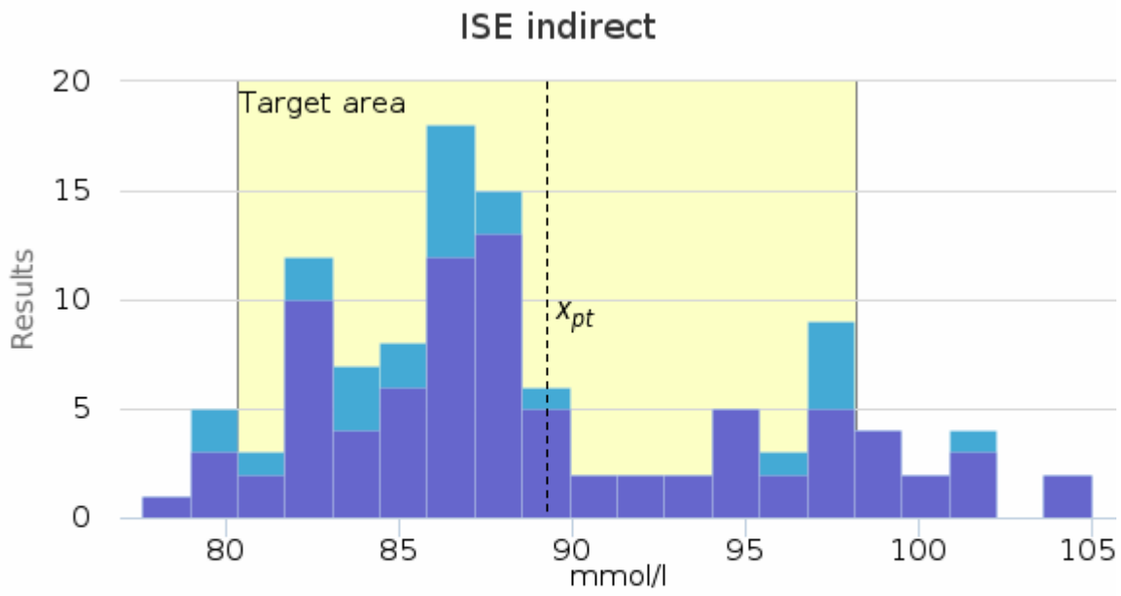


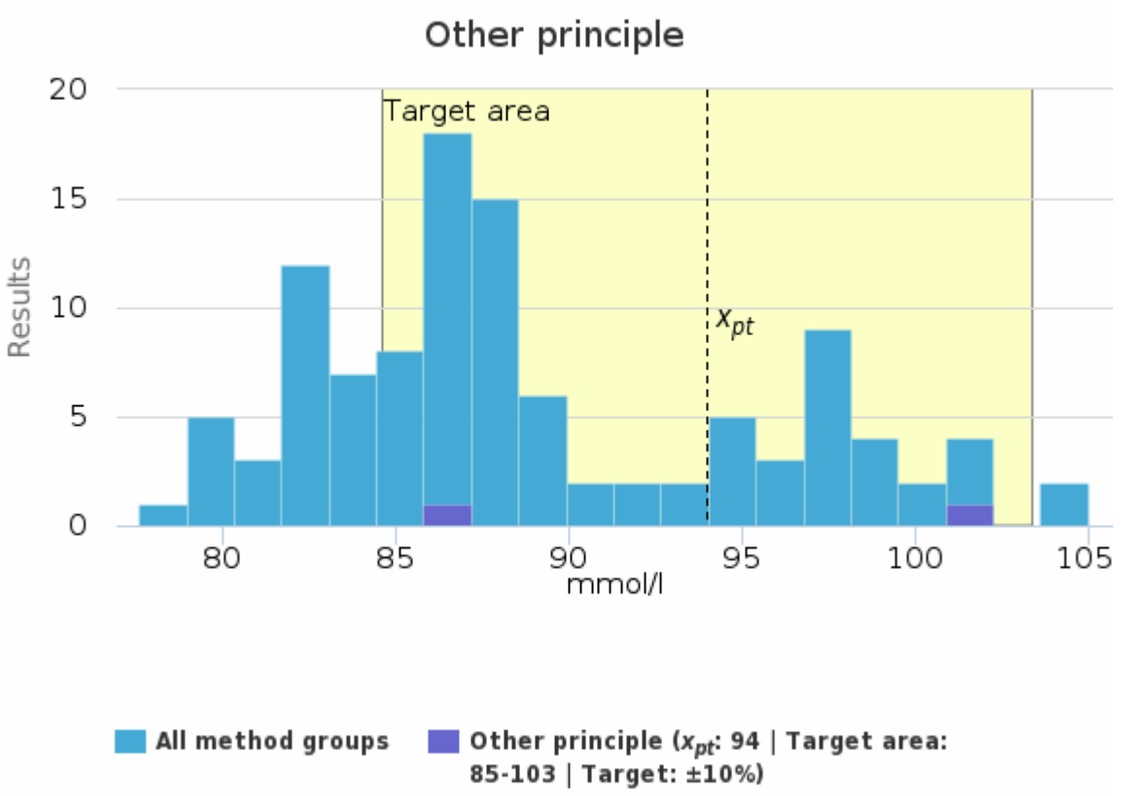
Specimen S002 | U-Cl, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
ISE direct	87	86	6	6.6	1	80	98	-	23
ISE indirect	89	88	6	7.3	<1	78	105	-	85
Other principle	94	94	11	12.0	8	86	102	-	2
All	**89**	**88**	**6**	**7.2**	**<1**	**78**	**105**	**-**	**110**

Specimen S002 | U-Cl, mmol/l| histogram summaries in LabScala



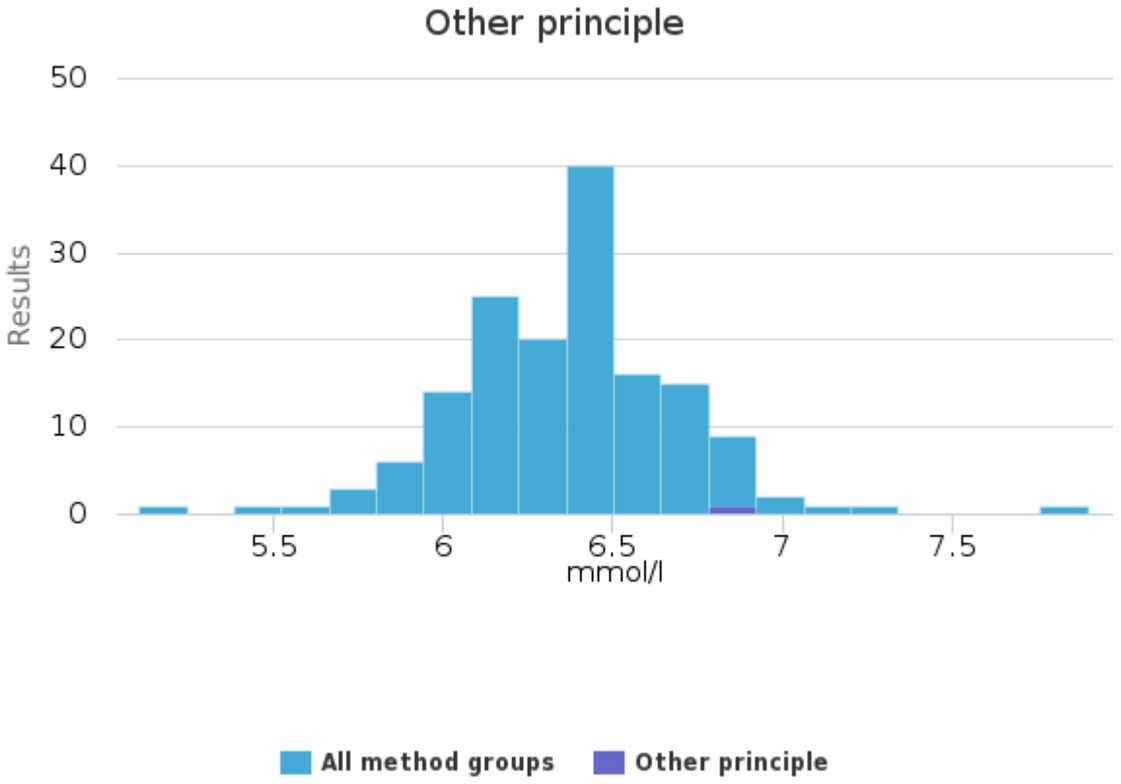


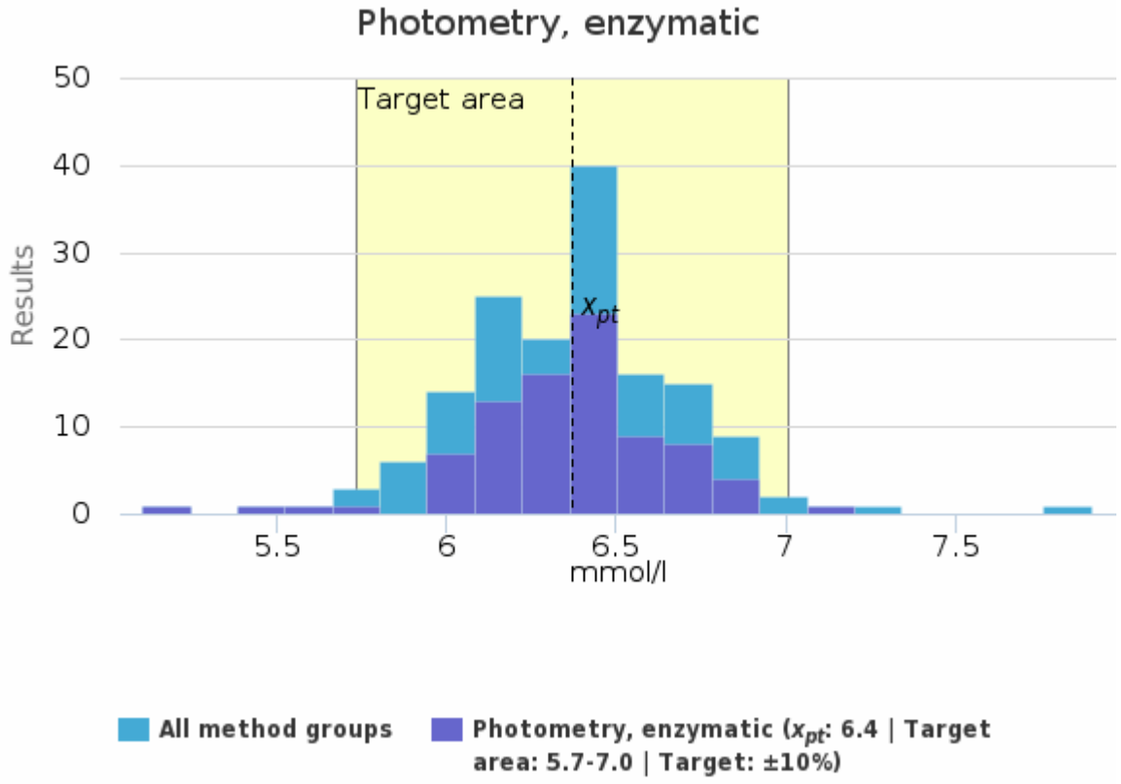


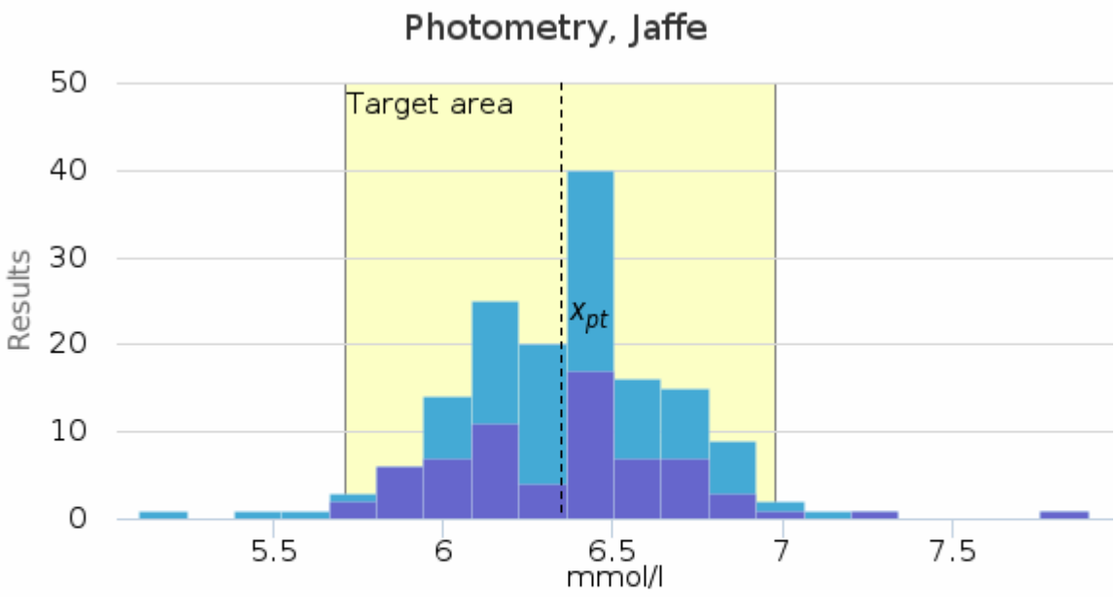
Specimen S002 | U-Creatinine, mmol/l

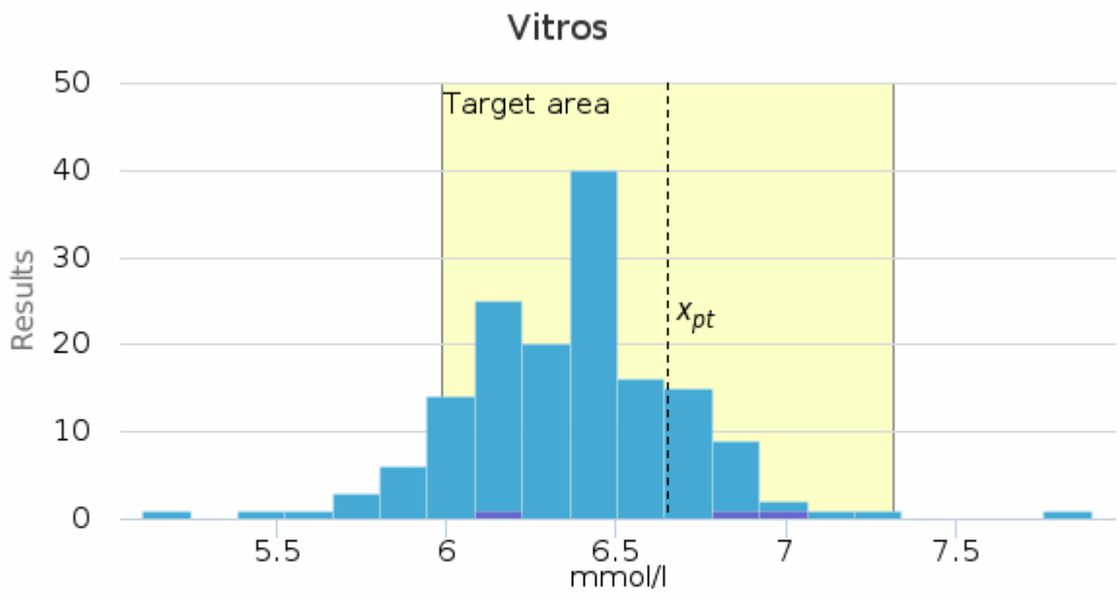
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Other principle	-	-	-	-	-	6.9	6.9	-	1
Photometry, enzymatic	6.4	6.4	0.3	4.2	<0.1	5.5	7.1	1	85
Photometry, Jaffe	6.3	6.4	0.3	5.0	<0.1	5.8	7.3	1	67
Vitros	6.7	6.9	0.4	6.7	0.3	6.1	6.9	-	3
All	**6.4**	**6.4**	**0.3**	**4.7**	**<0.1**	**5.5**	**7.3**	**2**	**156**

Specimen S002 | U-Creatinine, mmol/l| histogram summaries in LabScala





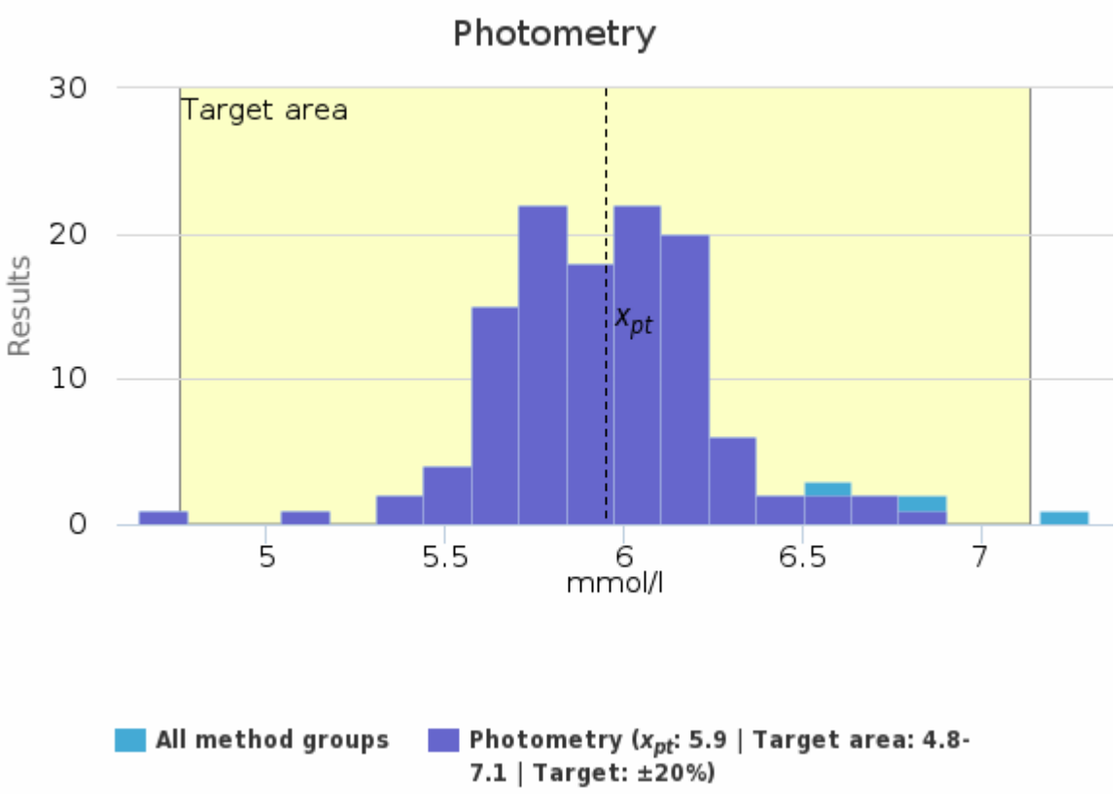


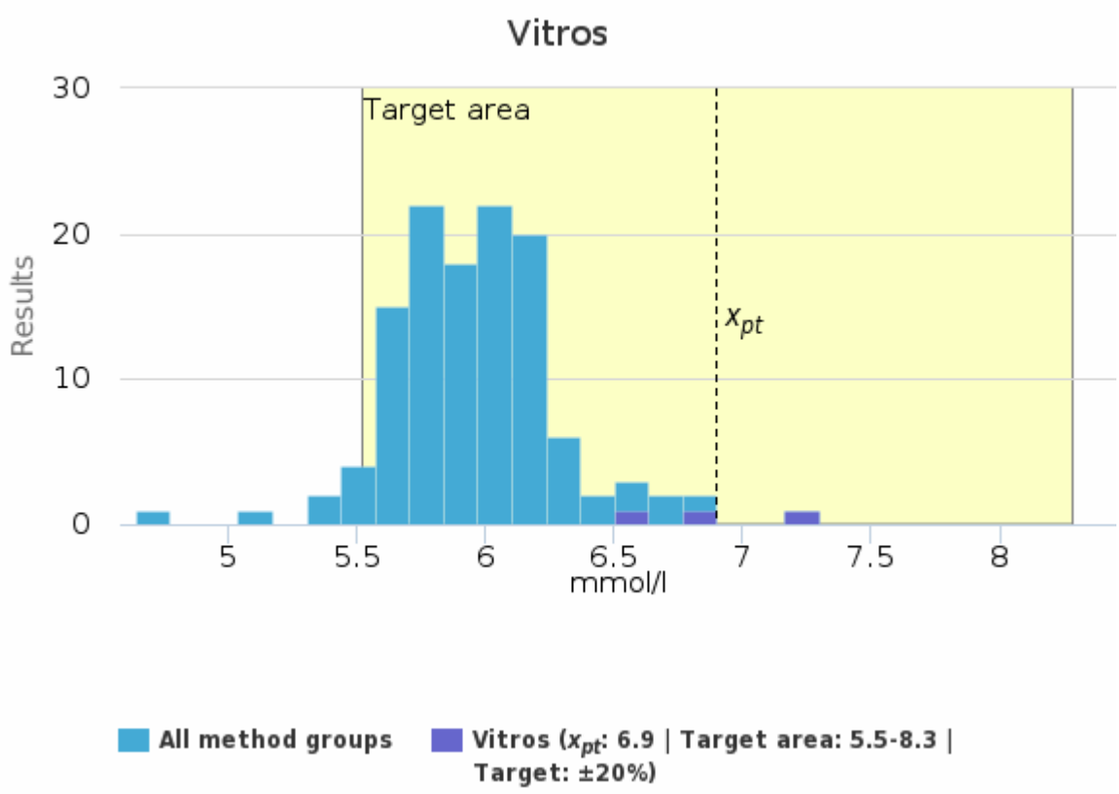


Specimen S002 | U-Phosphate inorganic, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Photometry	5.9	6.0	0.3	4.7	<0.1	5.1	6.8	1	118
Vitros	6.9	6.8	0.4	5.3	0.2	6.6	7.3	-	3
All	**6.0**	**6.0**	**0.3**	**5.0**	**<0.1**	**5.1**	**6.8**	**2**	**121**

Specimen S002 | U-Phosphate inorganic, mmol/l| histogram summaries in LabScala

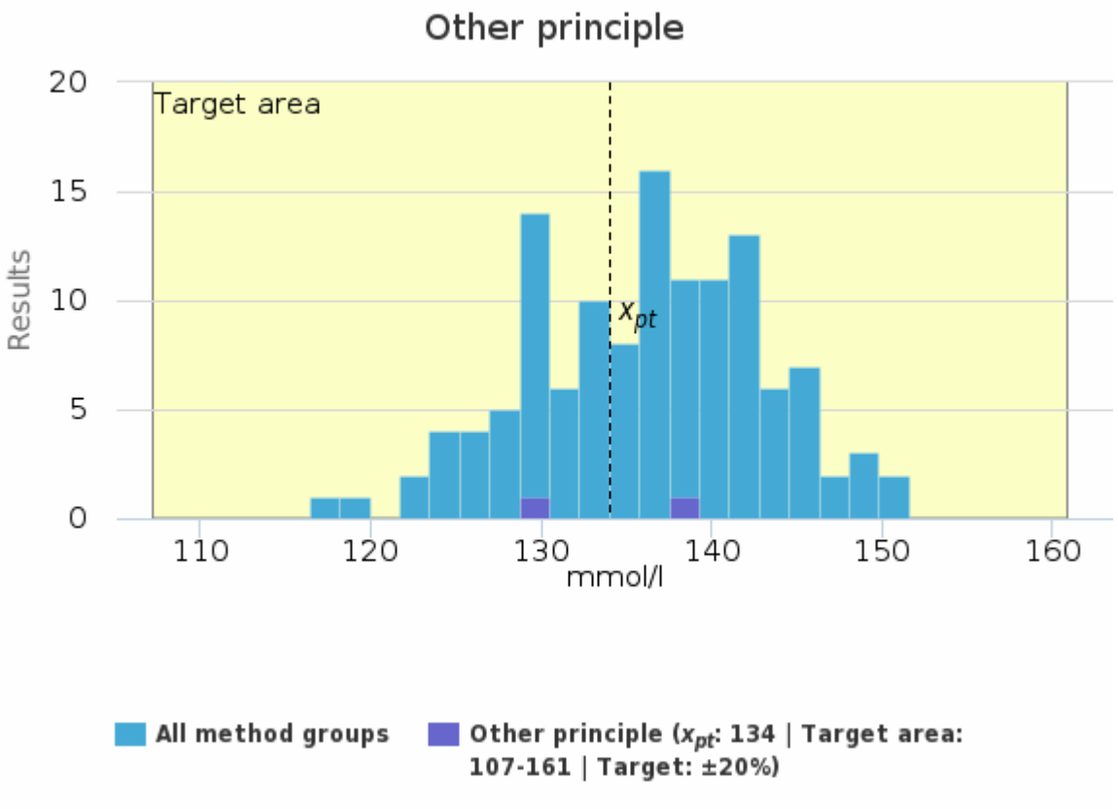


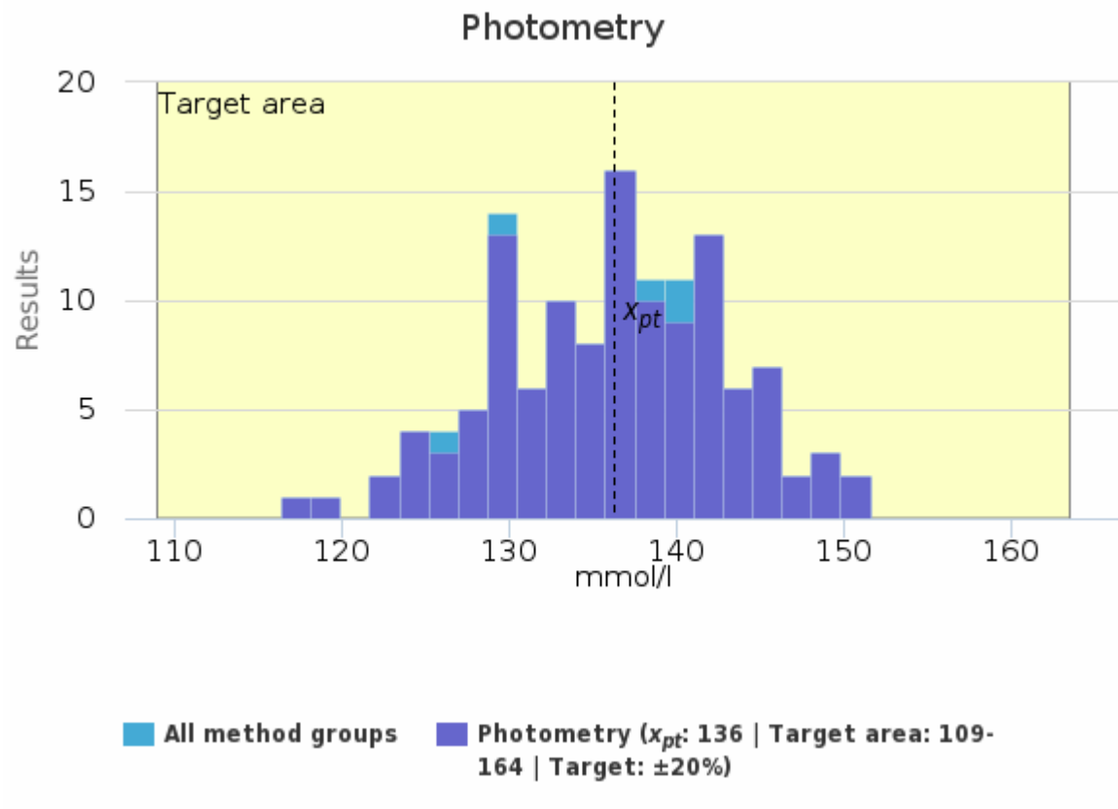


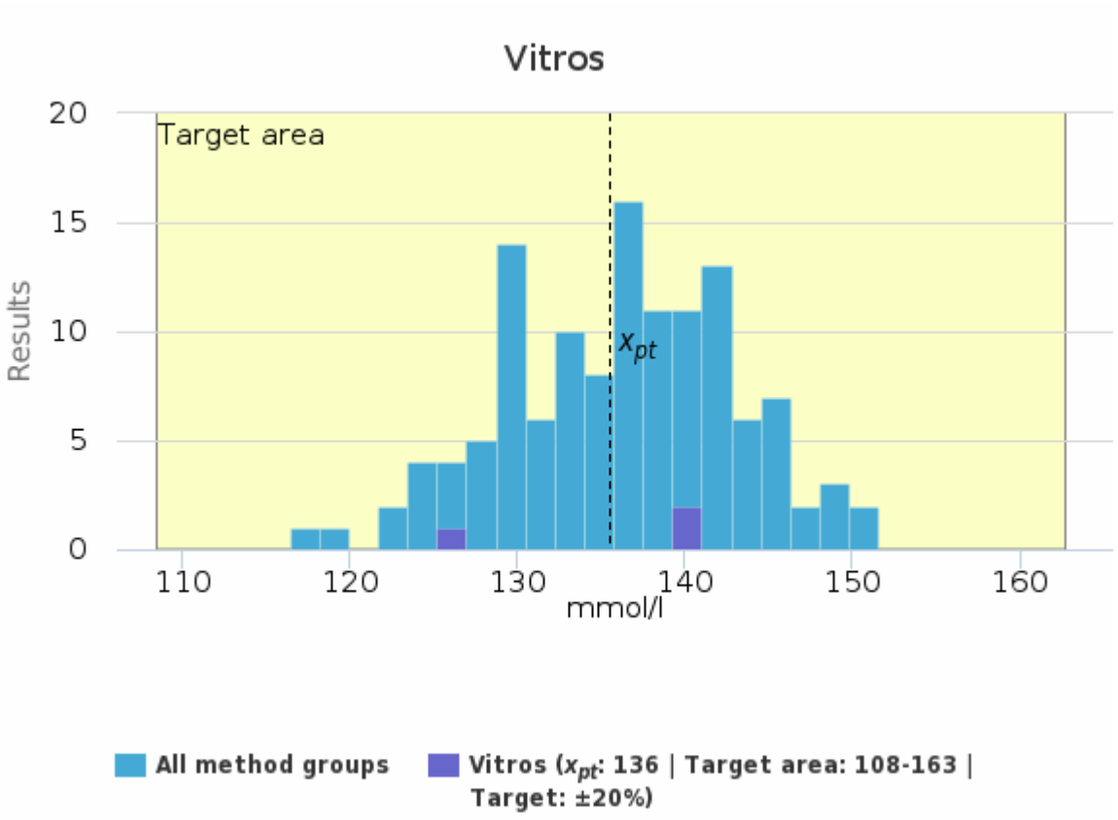
Specimen S002 | U-Urea, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Other principle	134	134	6	4.2	4	130	138	-	2
Photometry	136	137	7	5.2	<1	116	152	-	121
Vitros	136	139	8	5.9	5	126	141	-	3
All	**136**	**137**	**7**	**5.1**	**<1**	**116**	**152**	**-**	**126**

Specimen S002 | U-Urea, mmol/l| histogram summaries in LabScala



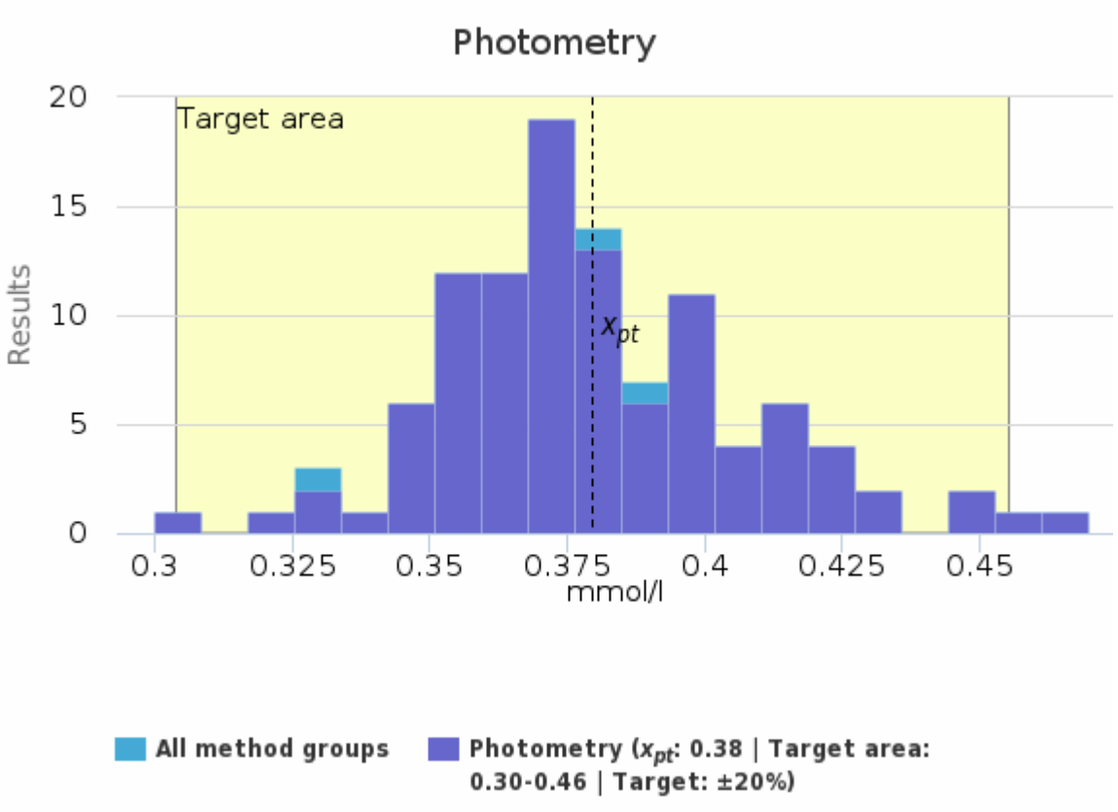


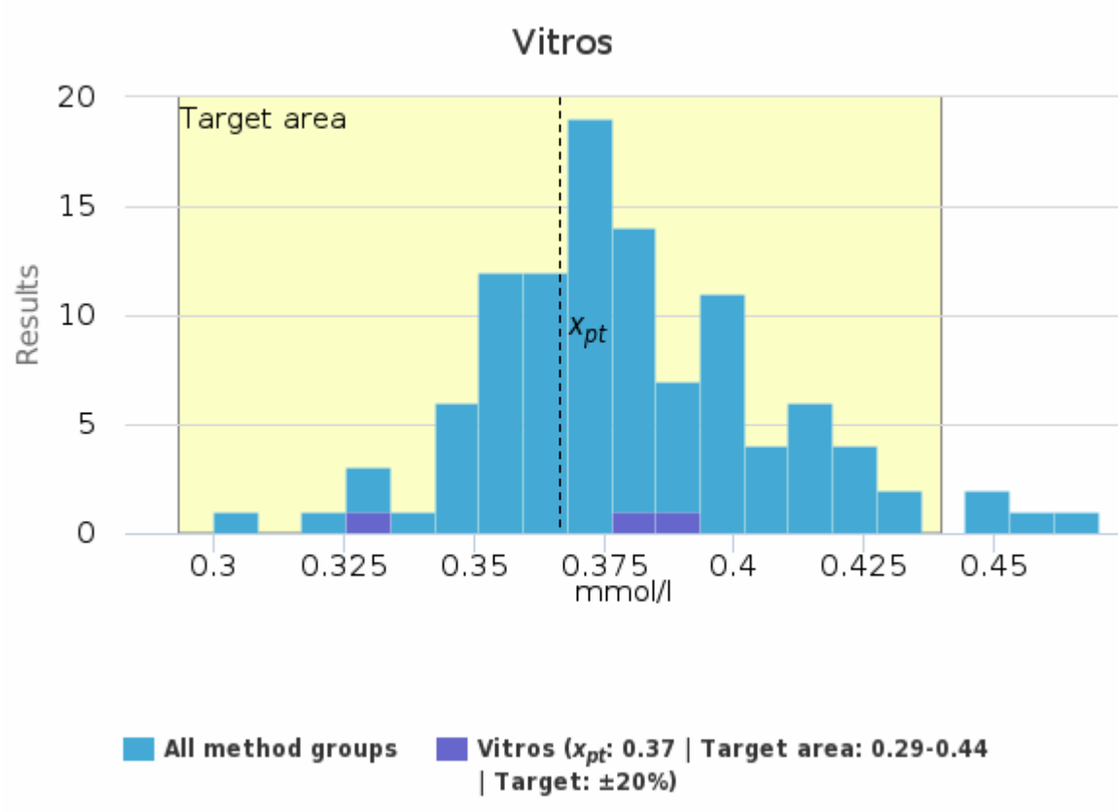


Specimen S002 | U -Uric acid, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Photometry	0.38	0.37	0.03	7.3	<0.01	0.30	0.46	1	104
Vitros	0.37	0.38	0.03	7.9	0.02	0.33	0.39	-	3
All	**0.38**	**0.37**	**0.03**	**7.3**	**<0.01**	**0.30**	**0.46**	**1**	**107**

Specimen S002 | U -Uric acid, mmol/l| histogram summaries in LabScala

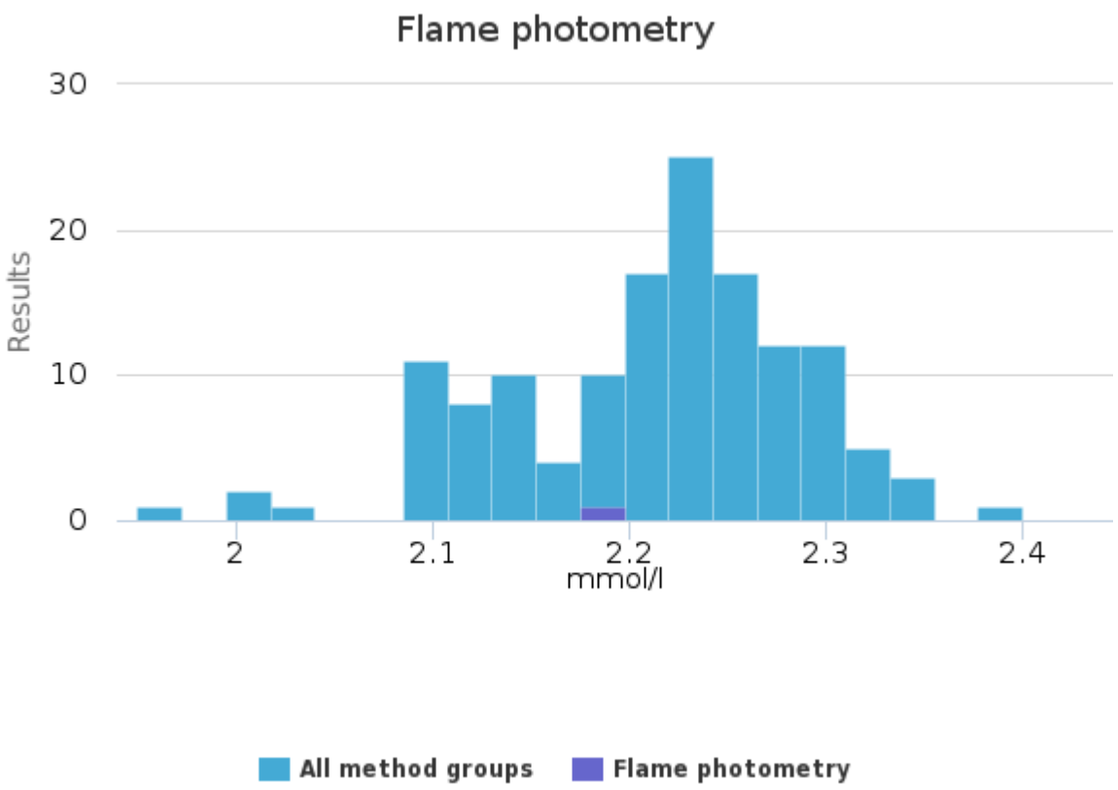


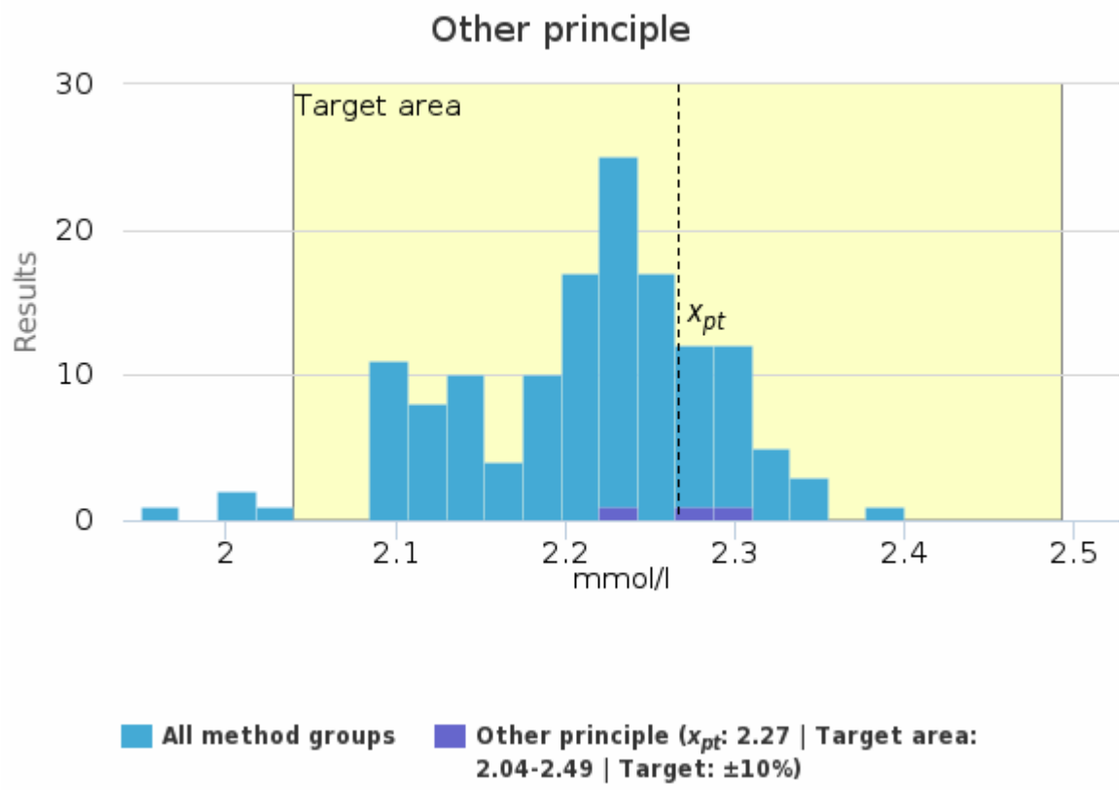


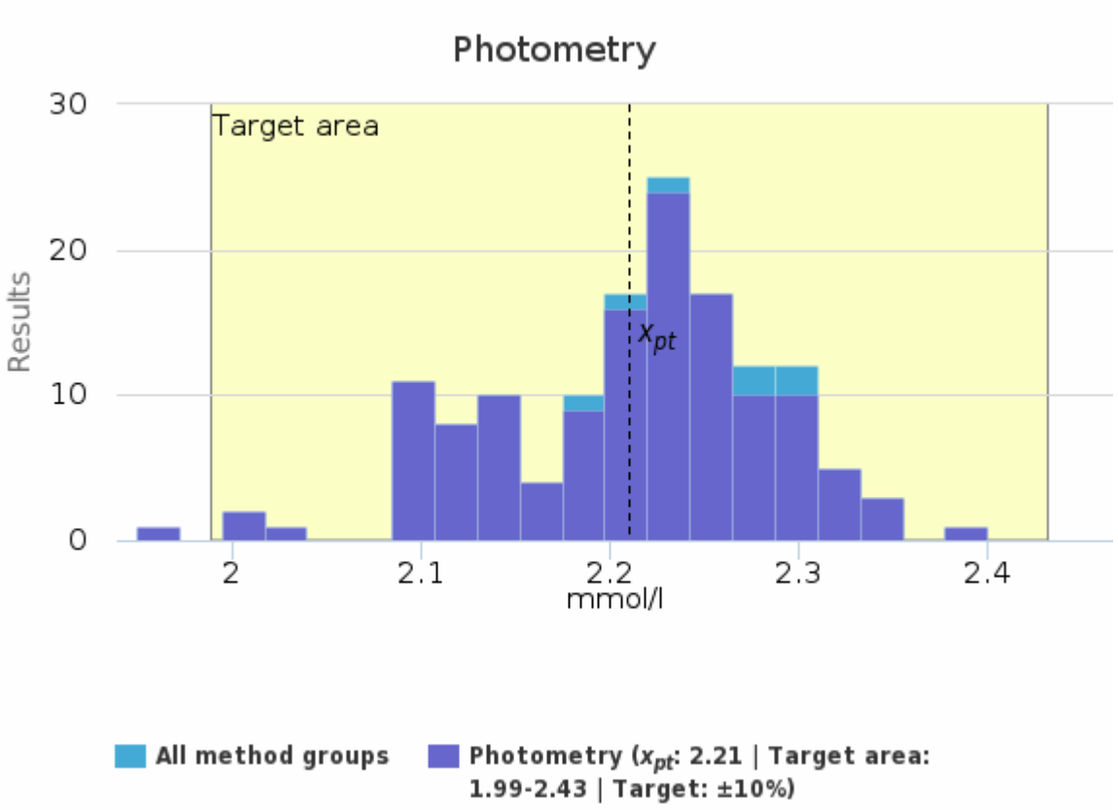
Specimen S002 | U-Ca, mmol/l

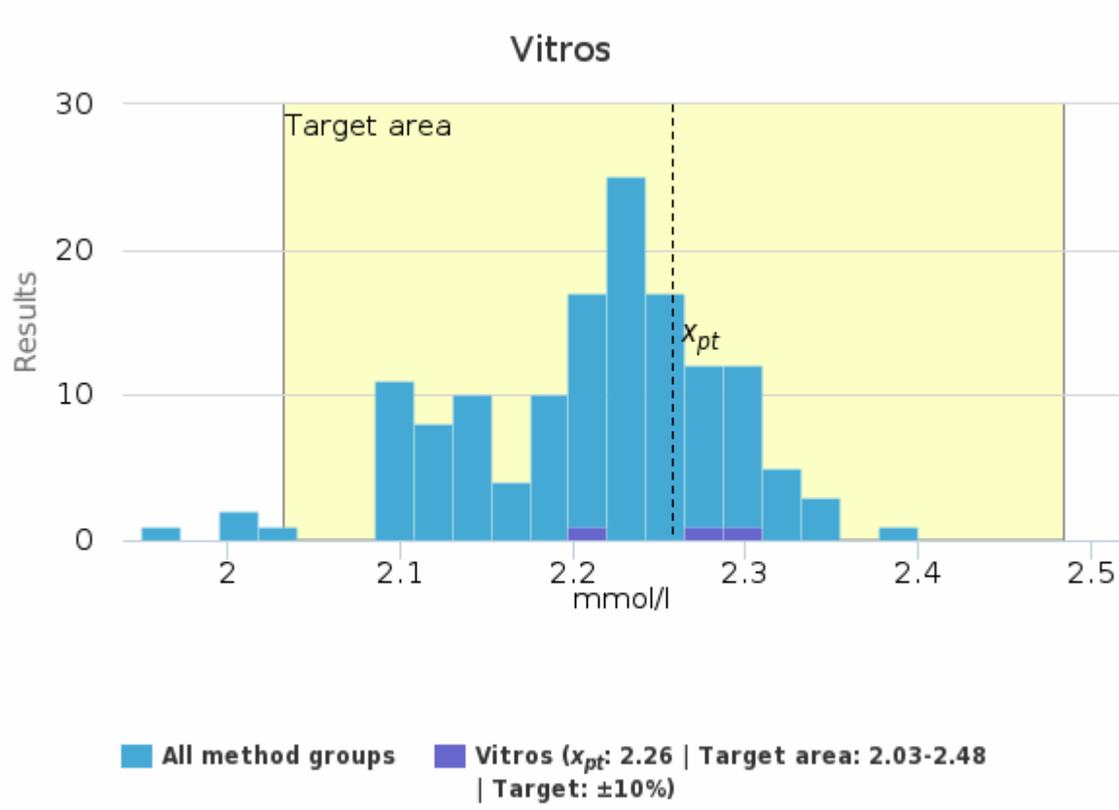
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Flame photometry	-	-	-	-	-	2.19	2.19	-	1
Other principle	2.27	2.28	0.03	1.4	0.02	2.23	2.29	-	3
Photometry	2.21	2.22	0.07	3.3	<0.01	2.00	2.40	1	132
Vitros	2.26	2.28	0.05	2.3	0.03	2.20	2.30	-	3
All	**2.21**	**2.22**	**0.07**	**3.3**	**<0.01**	**2.00**	**2.40**	**1**	**139**

Specimen S002 | U-Ca, mmol/l| histogram summaries in LabScala





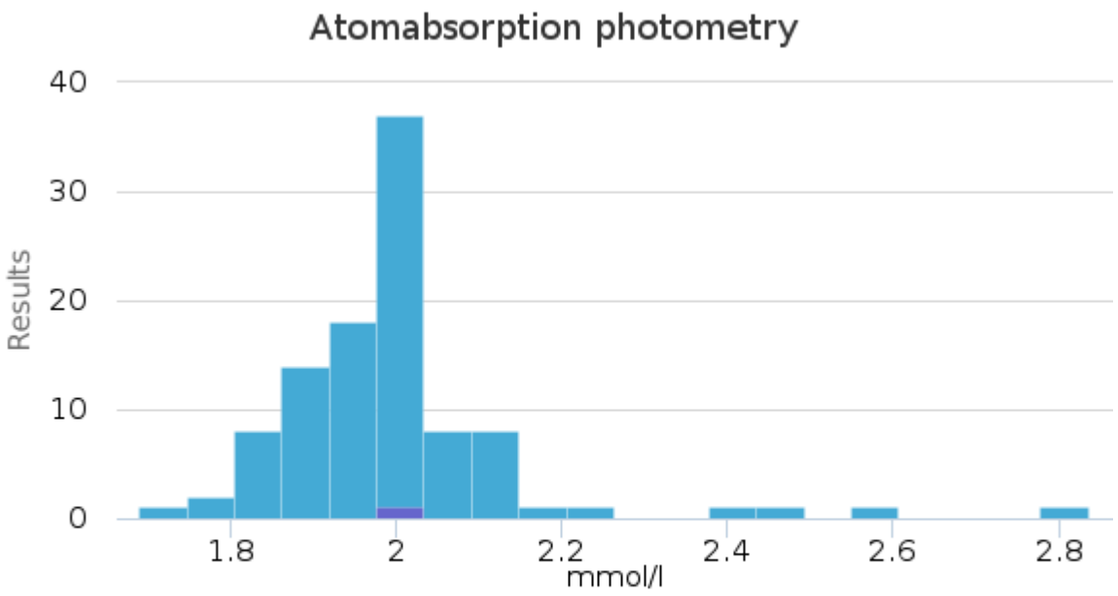


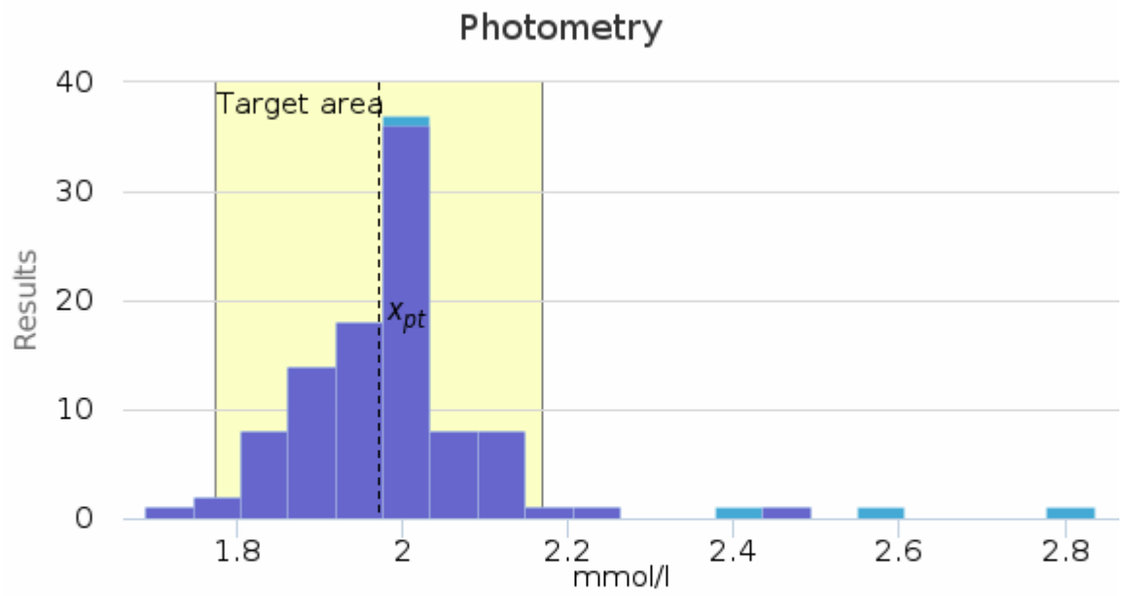


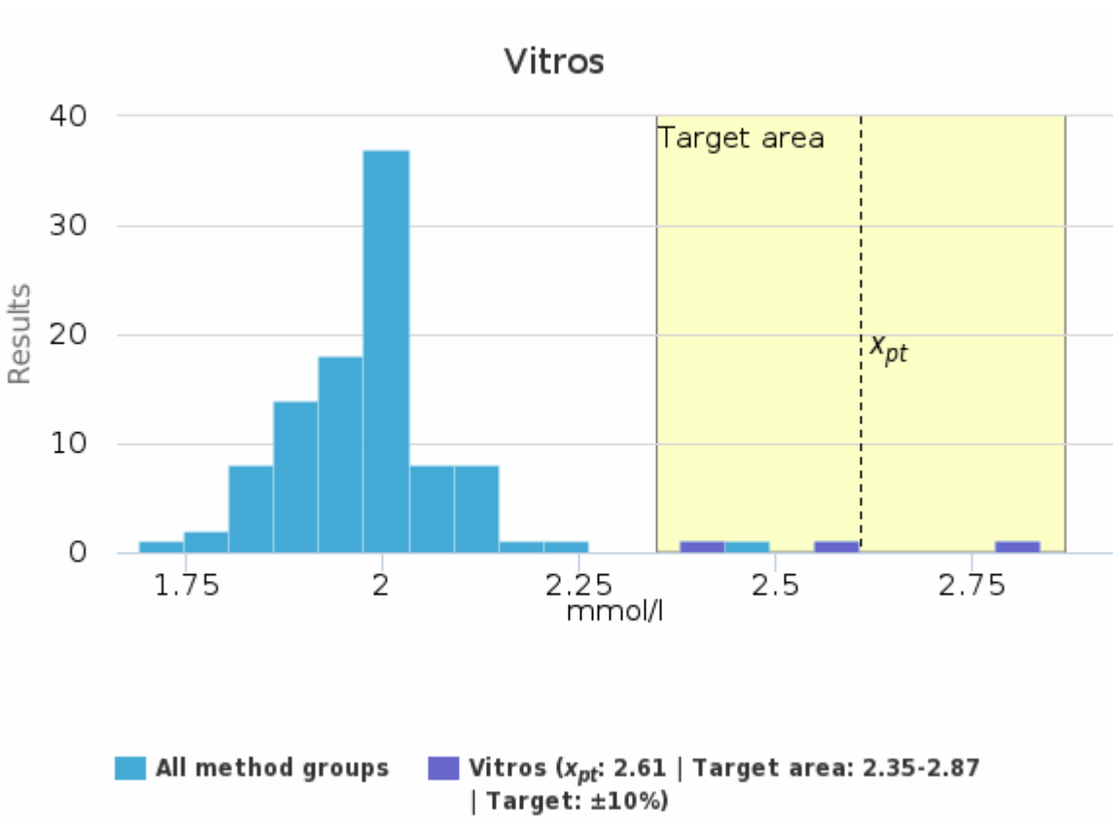
Specimen S002 | U-Mg, mmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Atomabsorption photometry	-	-	-	-	-	1.98	1.98	-	1
Photometry	1.97	1.98	0.09	4.5	<0.01	1.69	2.22	1	98
Vitros	2.61	2.59	0.22	8.4	0.13	2.40	2.84	-	3
All	**1.98**	**1.98**	**0.10**	**4.9**	**<0.01**	**1.69**	**2.40**	**3**	**102**

Specimen S002 | U-Mg, mmol/l| histogram summaries in LabScala



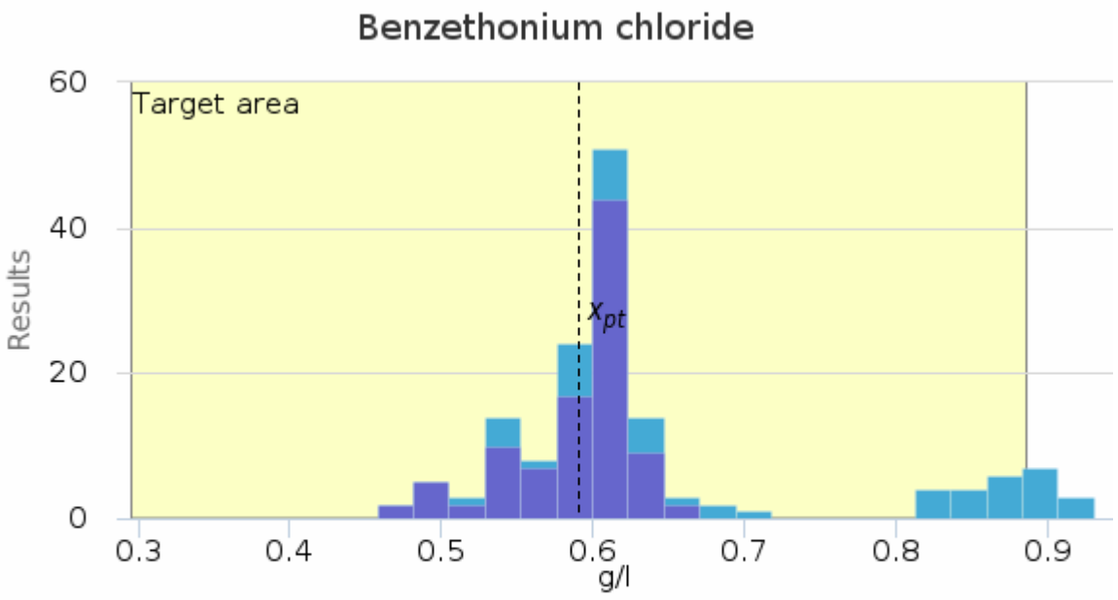


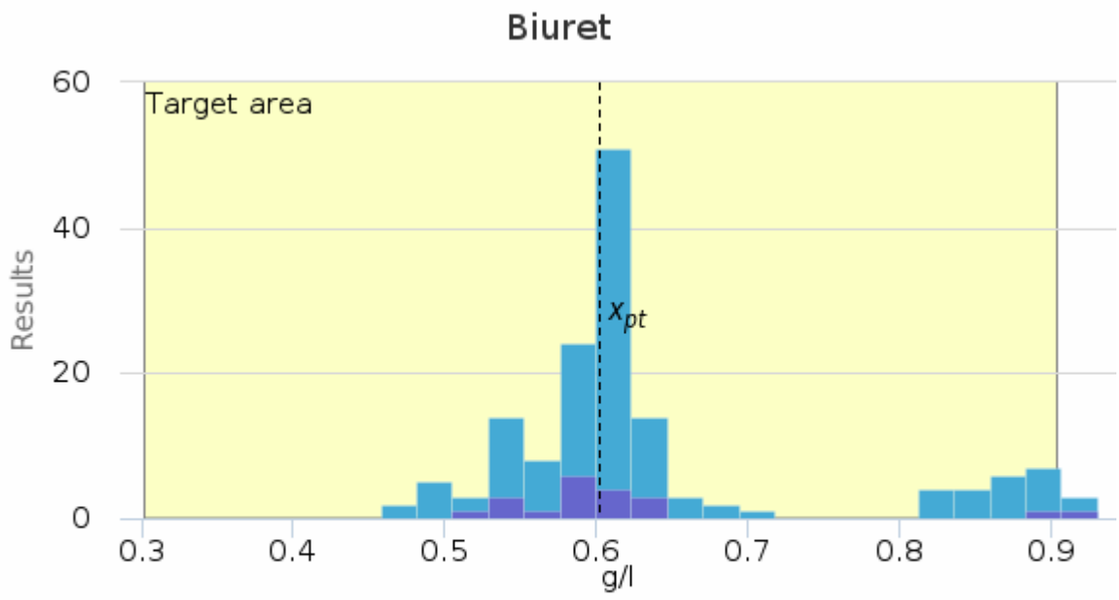


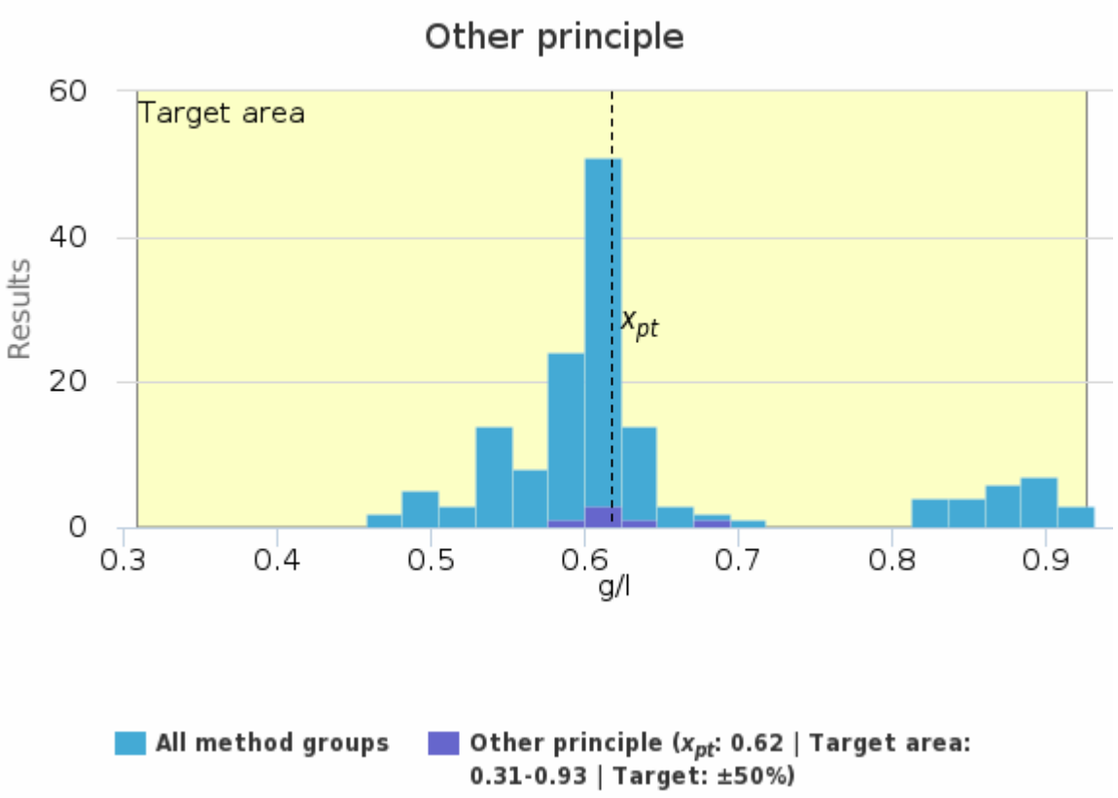
Specimen S002 | U-Prot, g/l

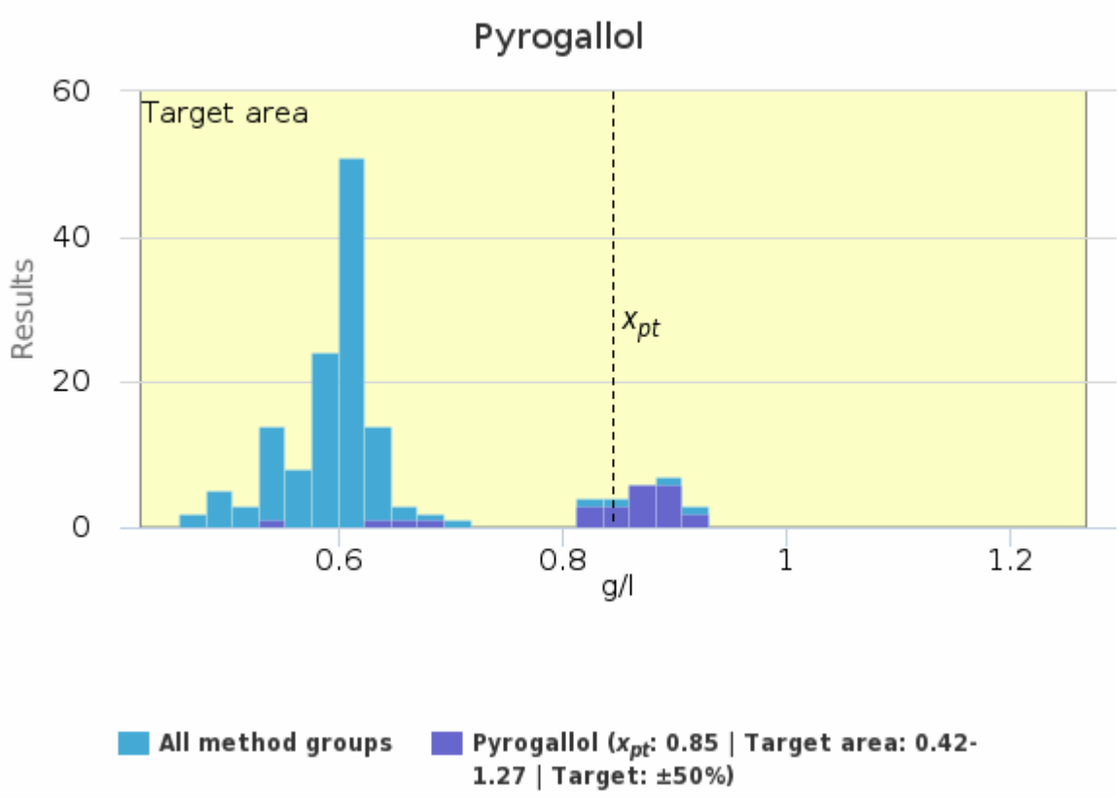
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Benzethonium chloride	0.59	0.60	0.04	6.2	<0.01	0.49	0.66	2	98
Biuret	0.60	0.59	0.08	12.6	0.02	0.52	0.89	1	20
Other principle	0.62	0.60	0.03	5.6	0.01	0.59	0.68	-	6
Pyrogallol	0.85	0.87	0.08	9.4	0.02	0.63	0.93	1	24
Vitros	0.79	0.83	0.07	9.1	0.04	0.71	0.84	-	3
All	**0.64**	**0.60**	**0.11**	**17.4**	**<0.01**	**0.46**	**0.93**	**-**	**151**

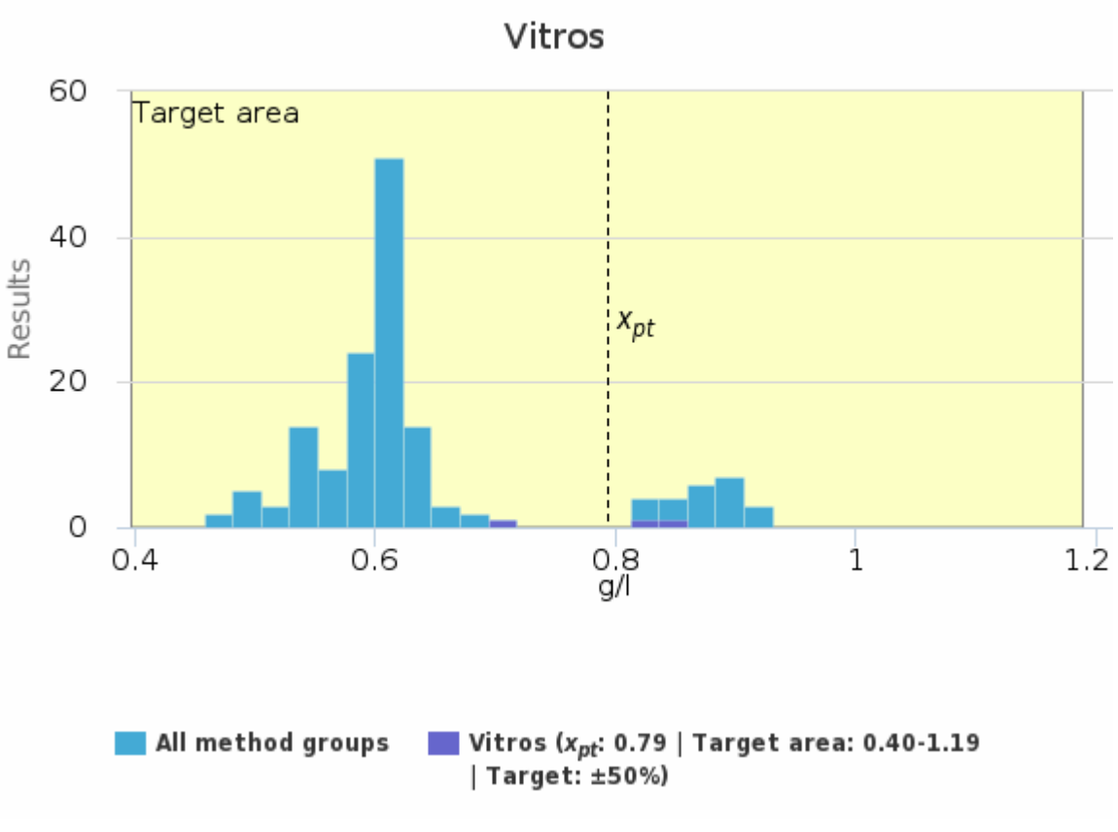
Specimen S002 | U-Prot, g/l| histogram summaries in LabScala







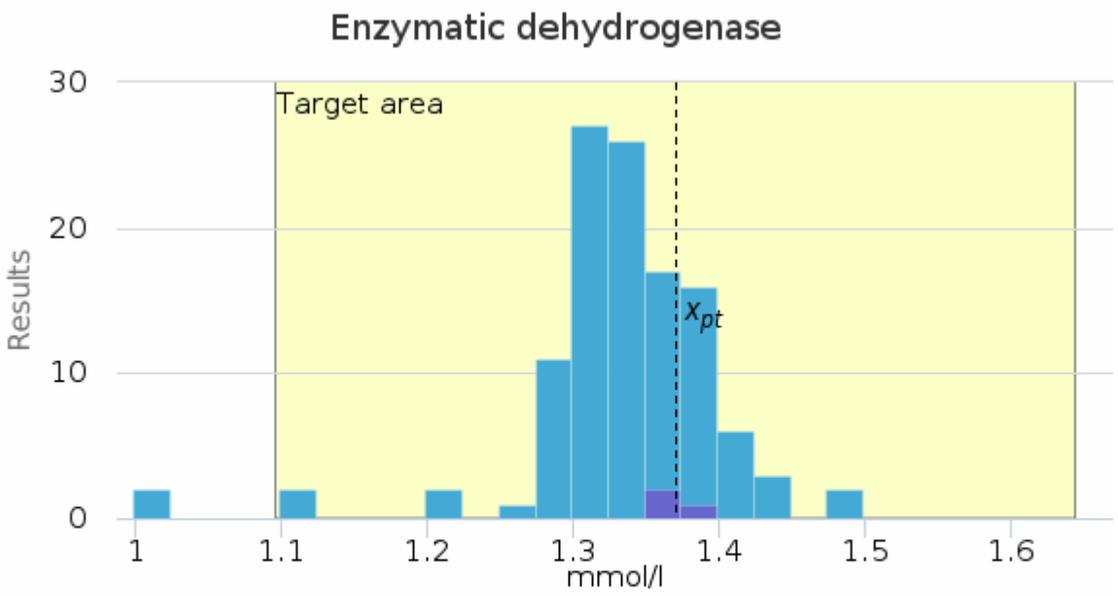


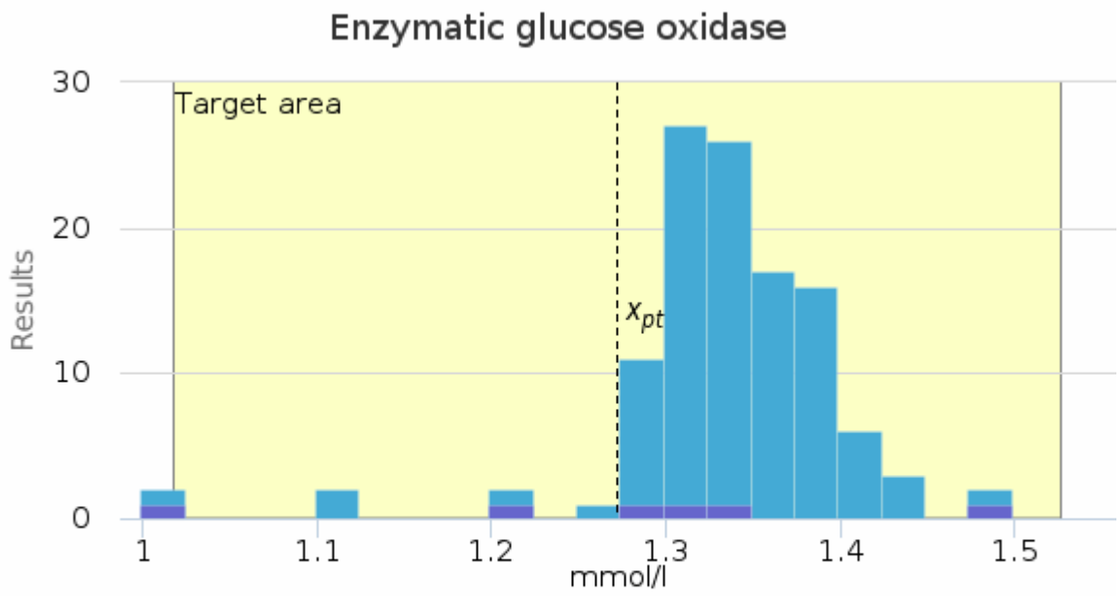


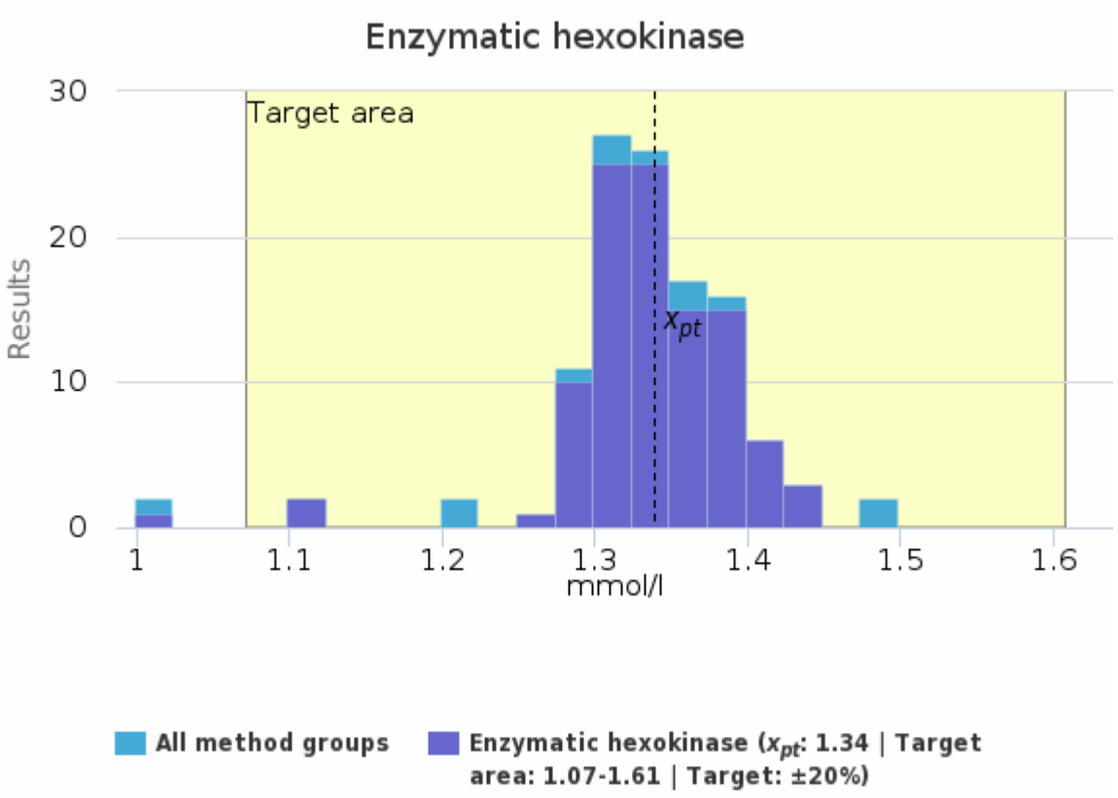
Specimen S002 | U -Glucose, mmol/l

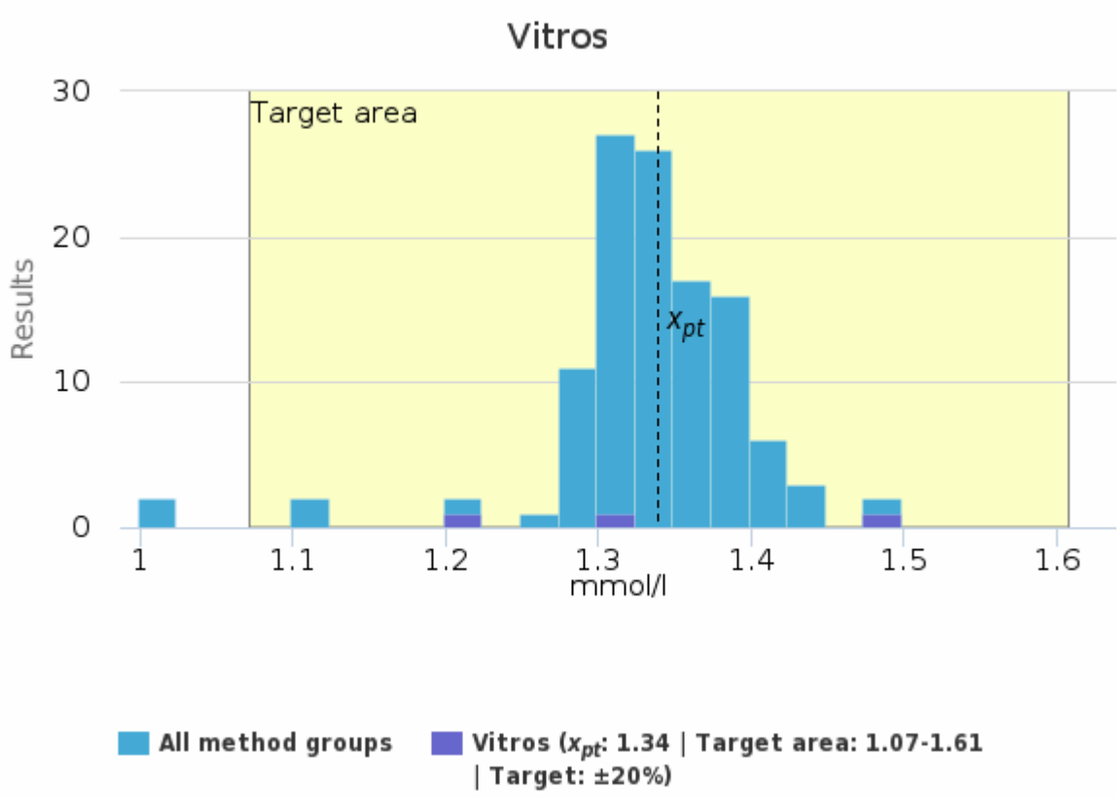
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Enzymatic dehydrogenase	1.37	1.37	0.01	0.7	<0.01	1.36	1.38	-	3
Enzymatic glucose oxidase	1.27	1.29	0.16	12.4	0.06	1.02	1.50	-	6
Enzymatic hexokinase	1.34	1.33	0.04	3.0	<0.01	1.27	1.44	3	103
Vitros	1.34	1.30	0.14	10.7	0.08	1.22	1.50	-	3
All	**1.34**	**1.33**	**0.05**	**3.6**	**<0.01**	**1.20**	**1.50**	**4**	**115**

Specimen S002 | U -Glucose, mmol/l| histogram summaries in LabScala





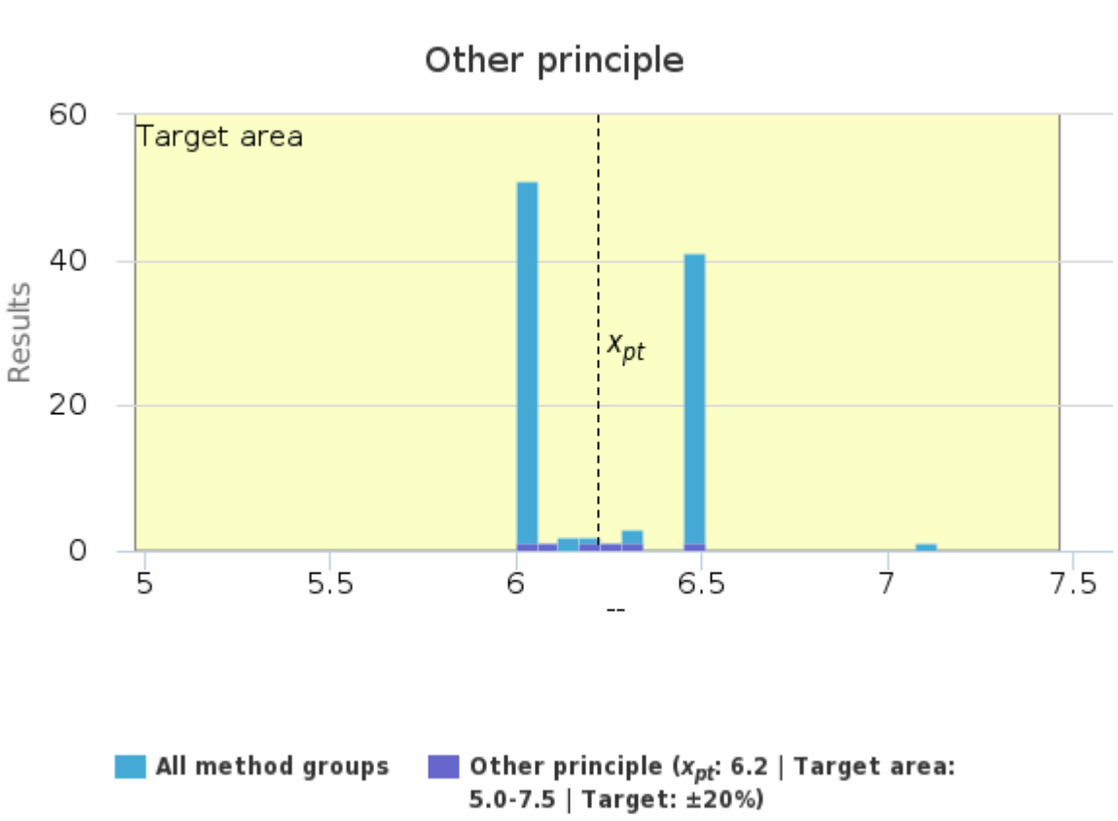


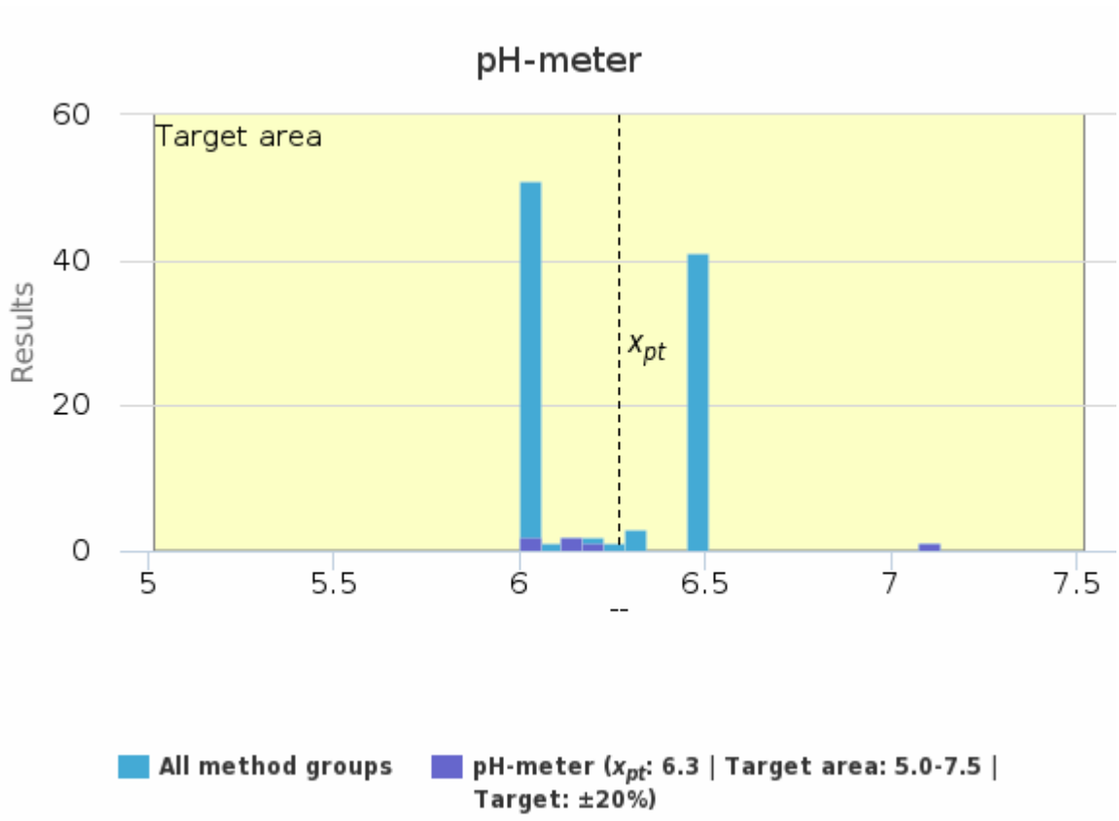


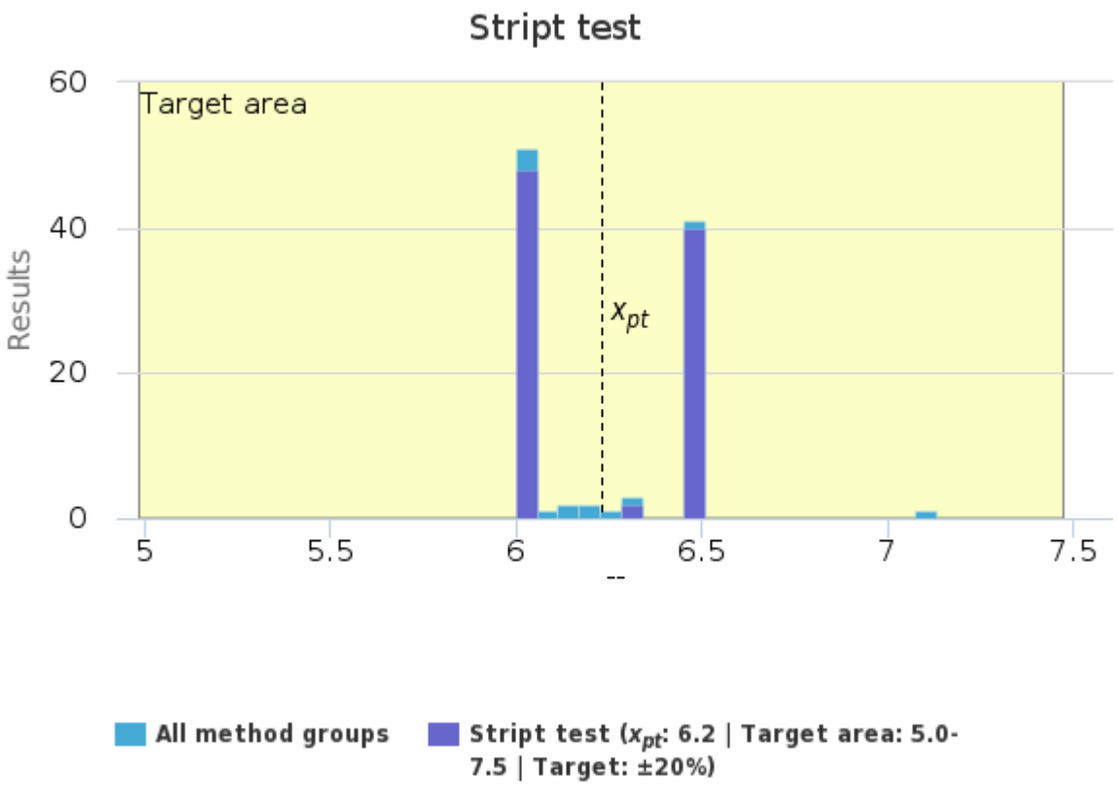
Specimen S002 | U-pH, --

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Other principle	6.2	6.2	0.2	2.8	<0.1	6.0	6.5	-	6
pH-meter	6.3	6.2	0.4	6.9	0.2	6.0	7.1	-	6
Stript test	6.2	6.0	0.2	4.0	<0.1	6.0	6.5	-	90
All	**6.2**	**6.0**	**0.2**	**3.8**	**<0.1**	**6.0**	**6.5**	**1**	**102**

Specimen S002 | U-pH, --| histogram summaries in LabScala



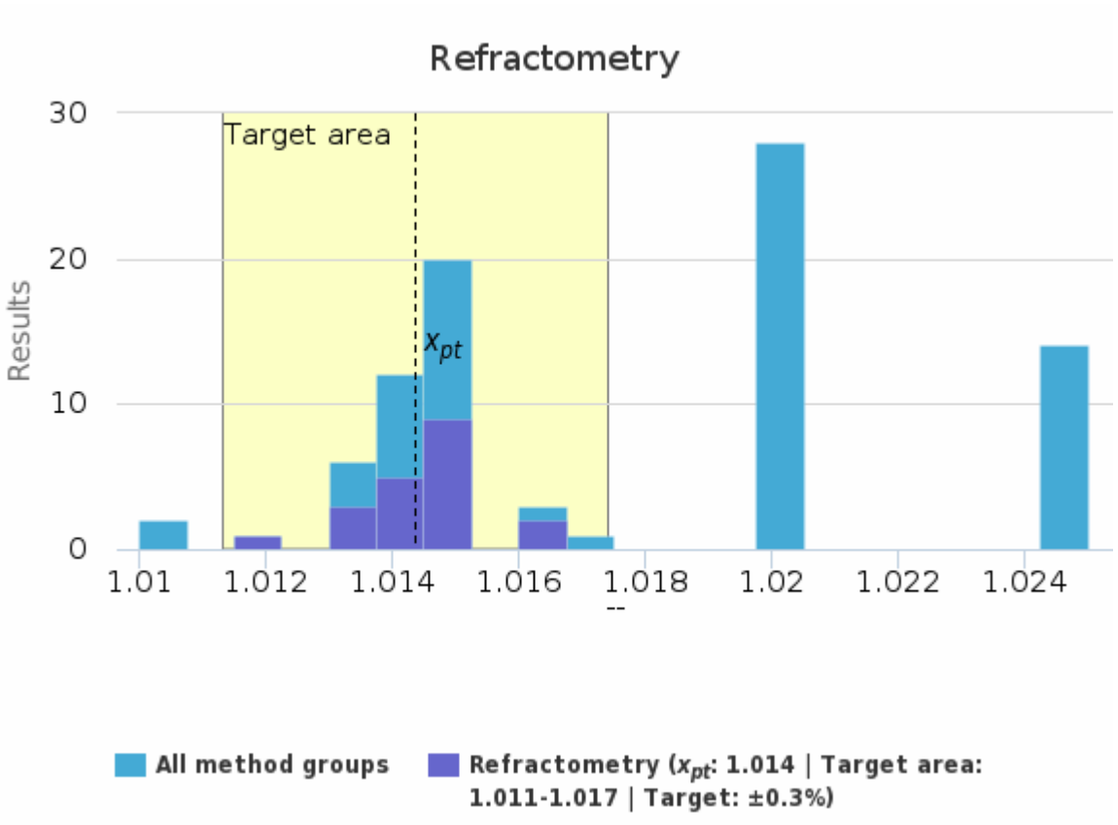


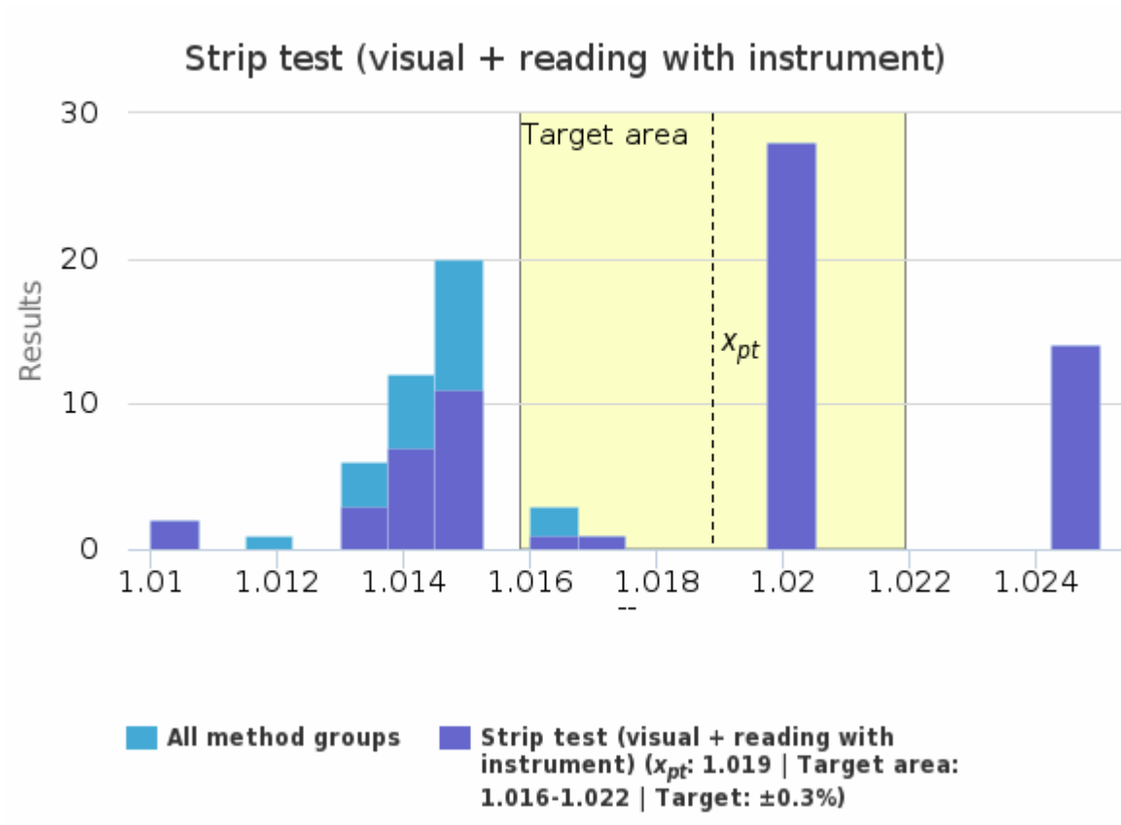


Specimen S002 | U-Relative density, --

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Refractometry	1.014	1.015	0.001	0.1	<0.001	1.012	1.016	-	20
Strip test (visual + reading with instrument)	1.019	1.020	0.004	0.4	<0.001	1.010	1.025	-	67
All	**1.018**	**1.016**	**0.004**	**0.4**	**<0.001**	**1.010**	**1.025**	**-**	**87**

Specimen S002 | U-Relative density, --| histogram summaries in LabScala

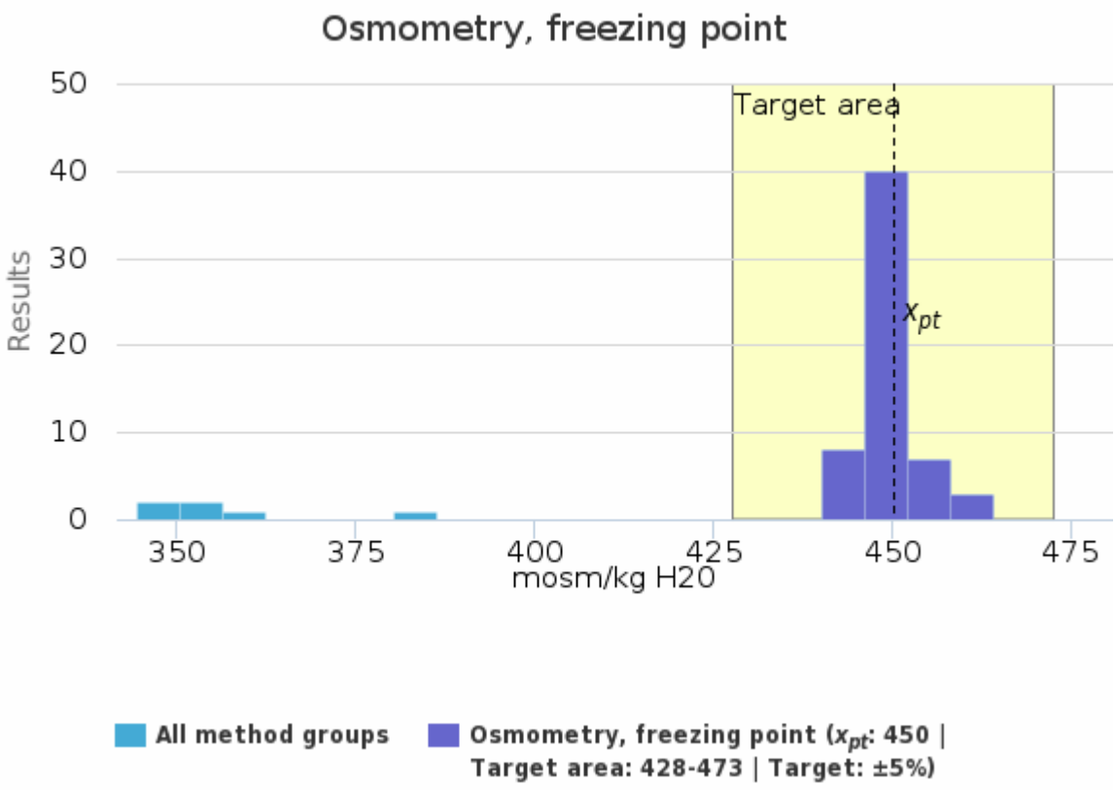


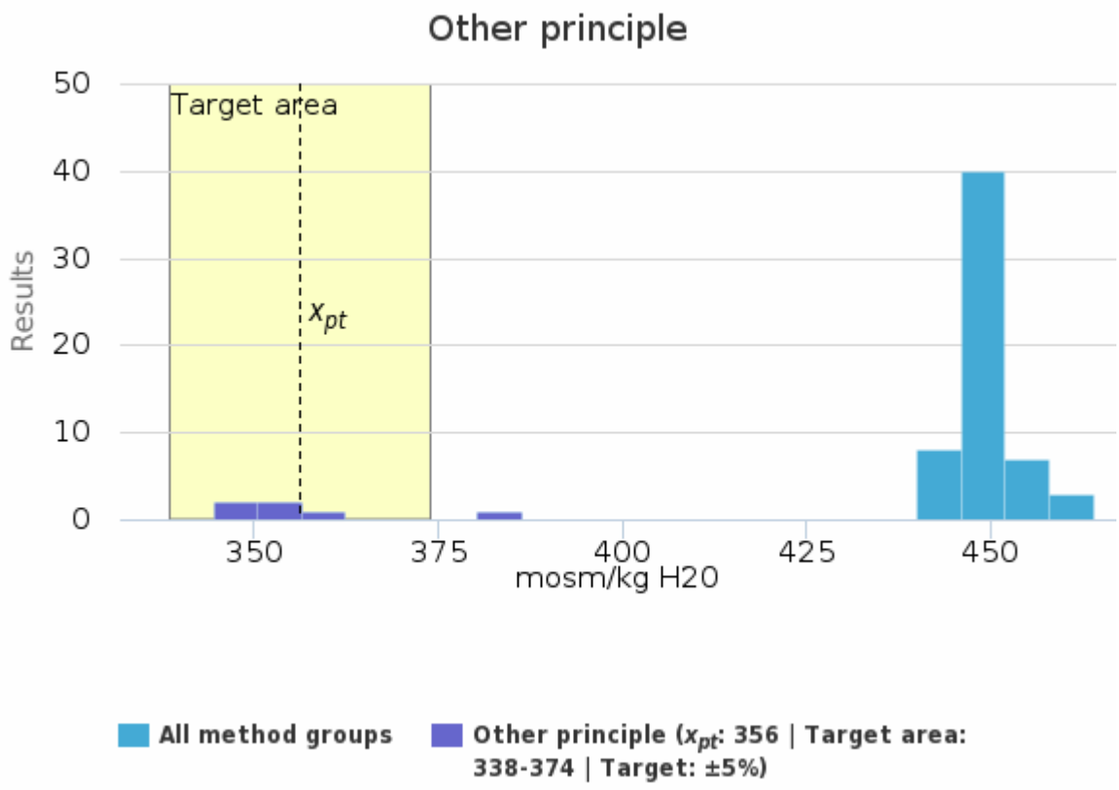


Specimen S002 | U-Osmolality, mosm/kg H20

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Osmometry, freezing point	450	450	4	0.8	<1	442	461	2	58
Other principle	356	351	15	4.1	6	345	384	-	6
All	**449**	**450**	**10**	**2.1**	**1**	**384**	**464**	**5**	**64**

Specimen S002 | U-Osmolality, mosm/kg H20| histogram summaries in LabScala

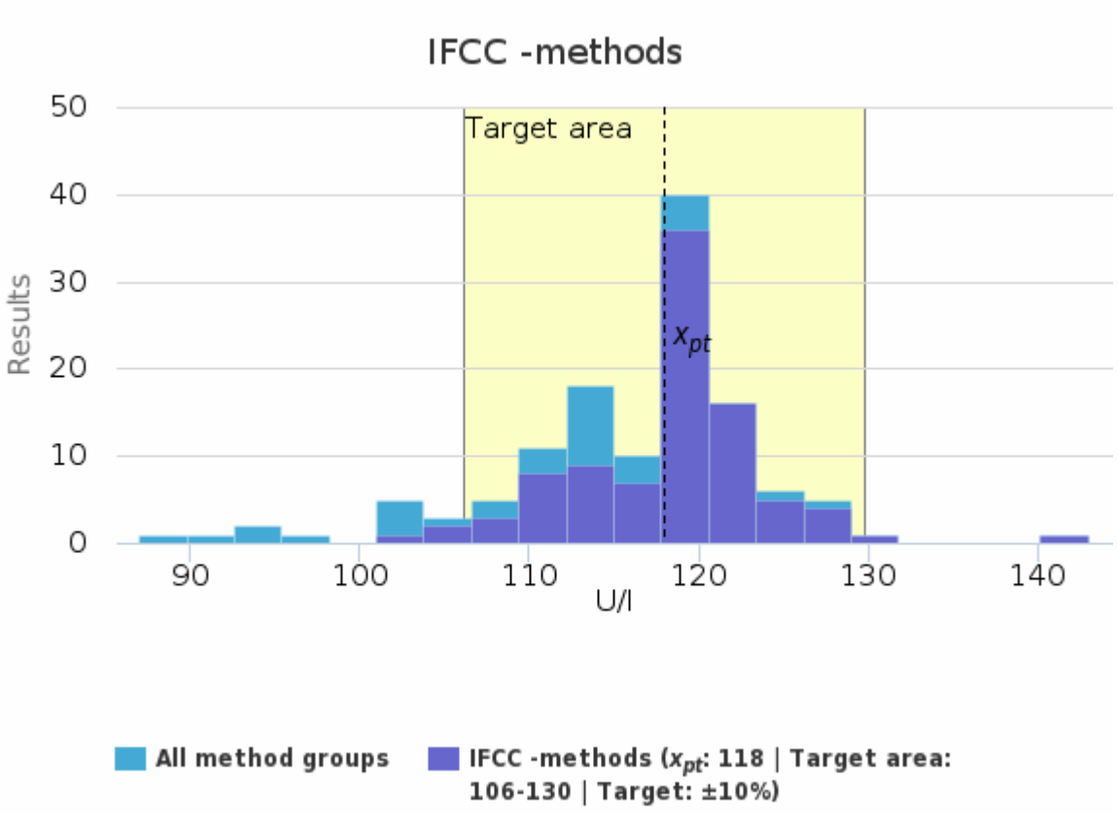


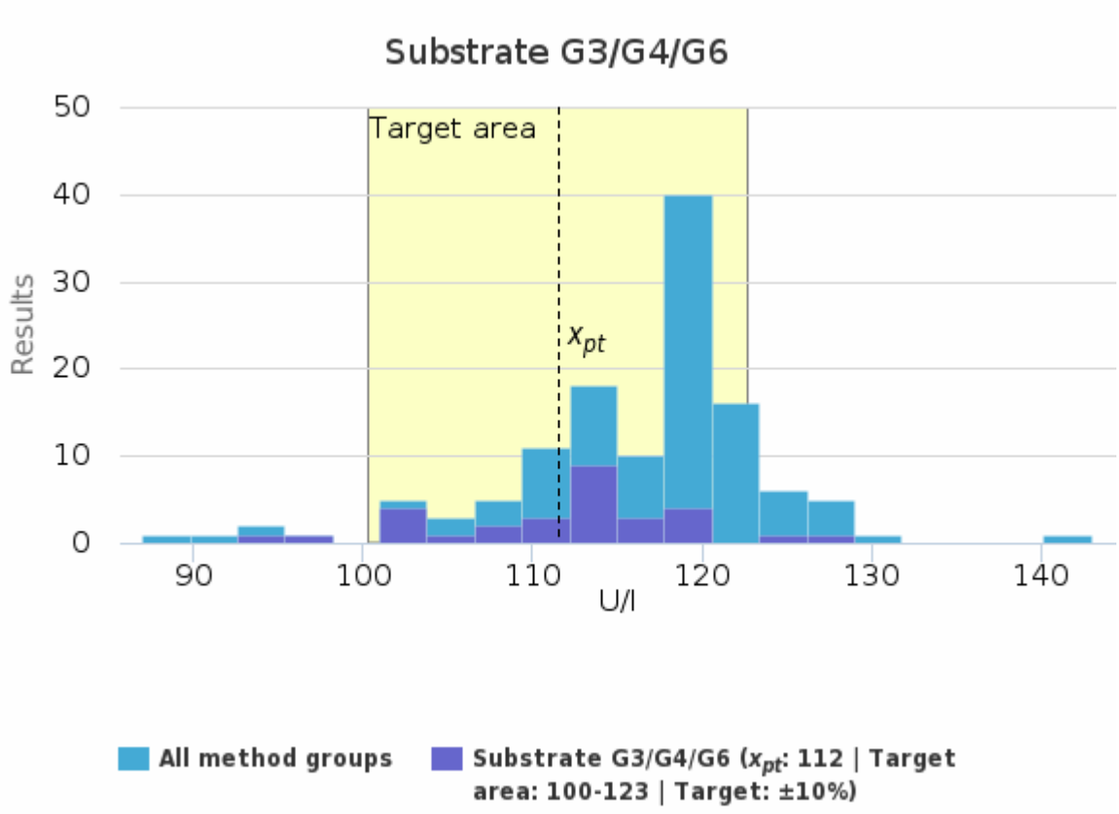


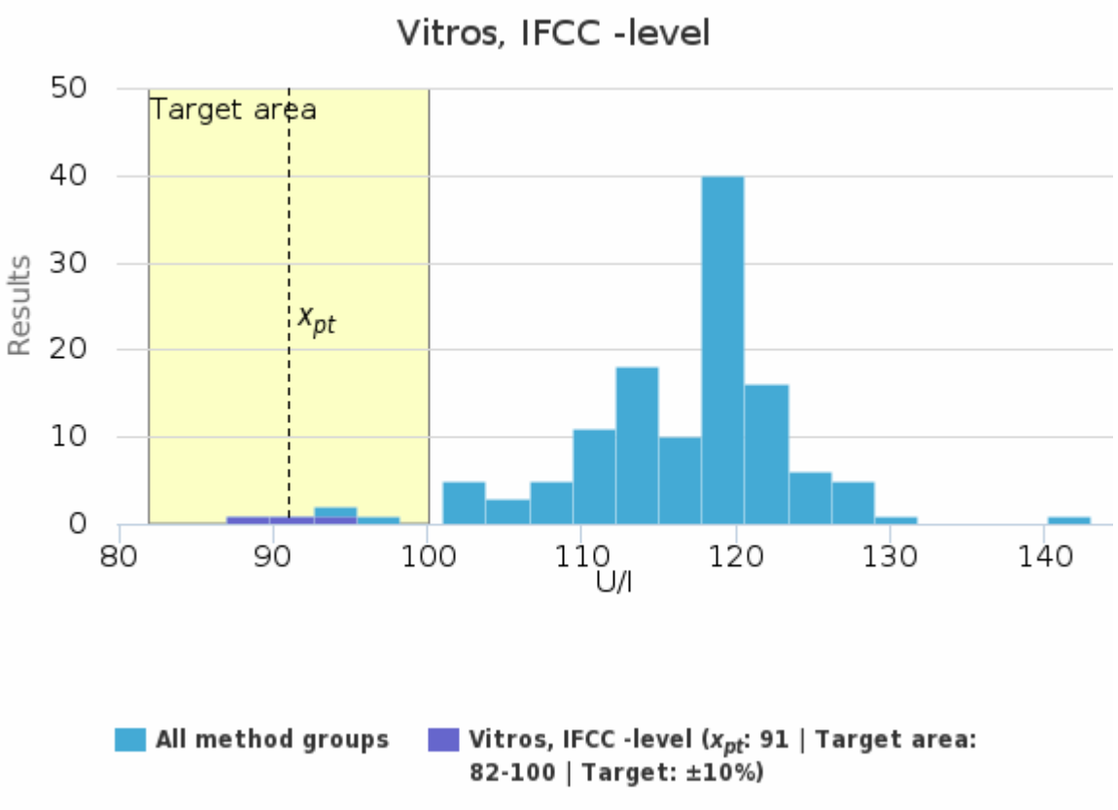
Specimen S002 | U-Amyl, U/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
IFCC -methods	118	119	5	4.4	<1	103	129	1	93
Substrate G3/G4/G6	112	113	8	6.8	1	94	127	-	30
Vitros, IFCC -level	91	92	4	4.0	2	87	94	-	3
All	**117**	**118**	**6**	**5.3**	**<1**	**97**	**129**	**5**	**126**

Specimen S002 | U-Amyl, U/l| histogram summaries in LabScala



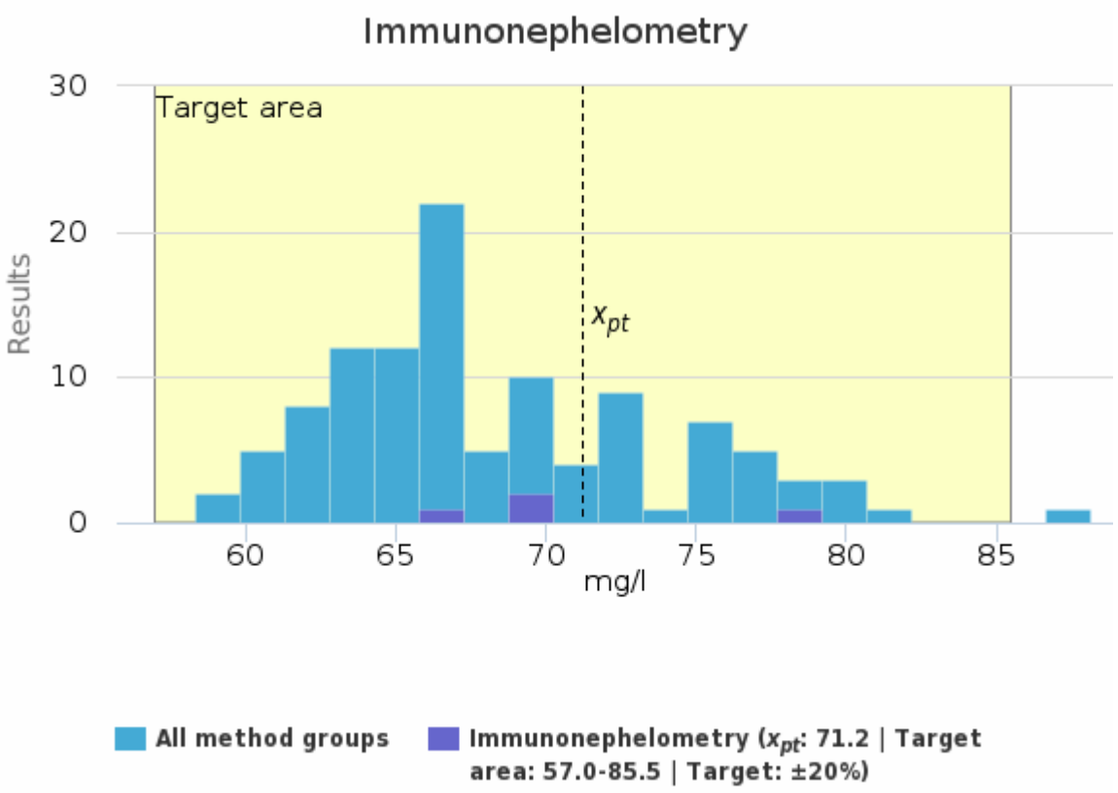


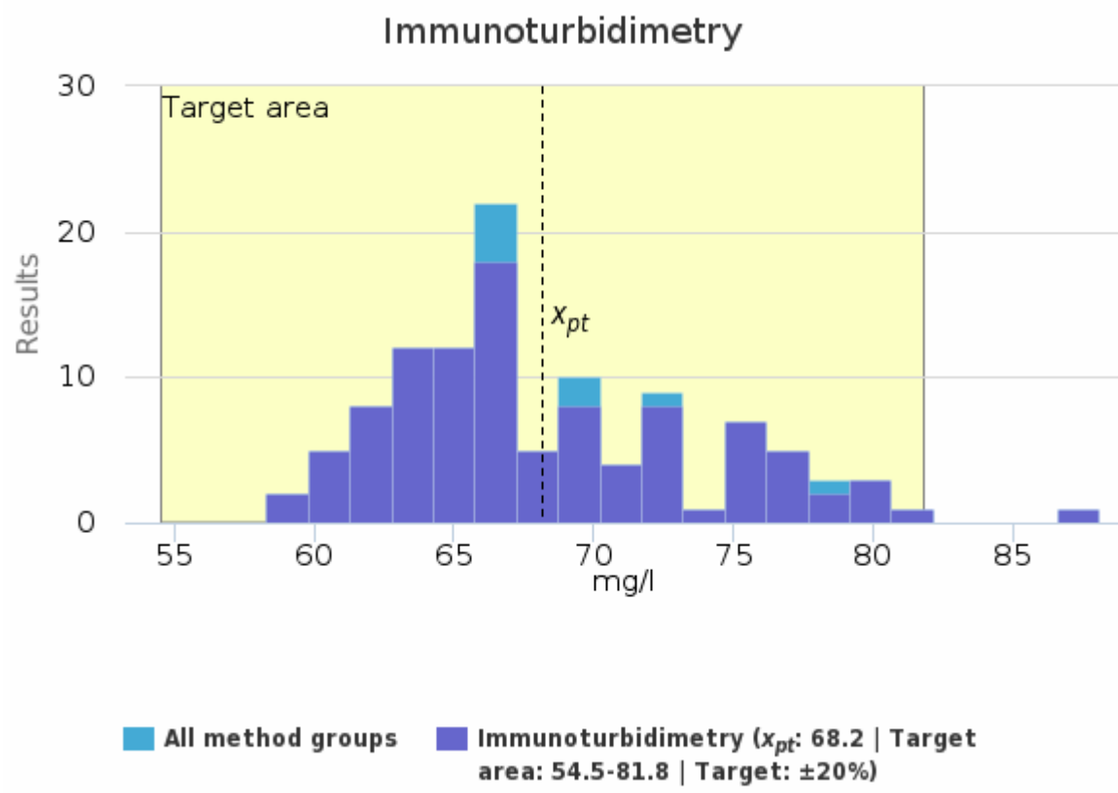


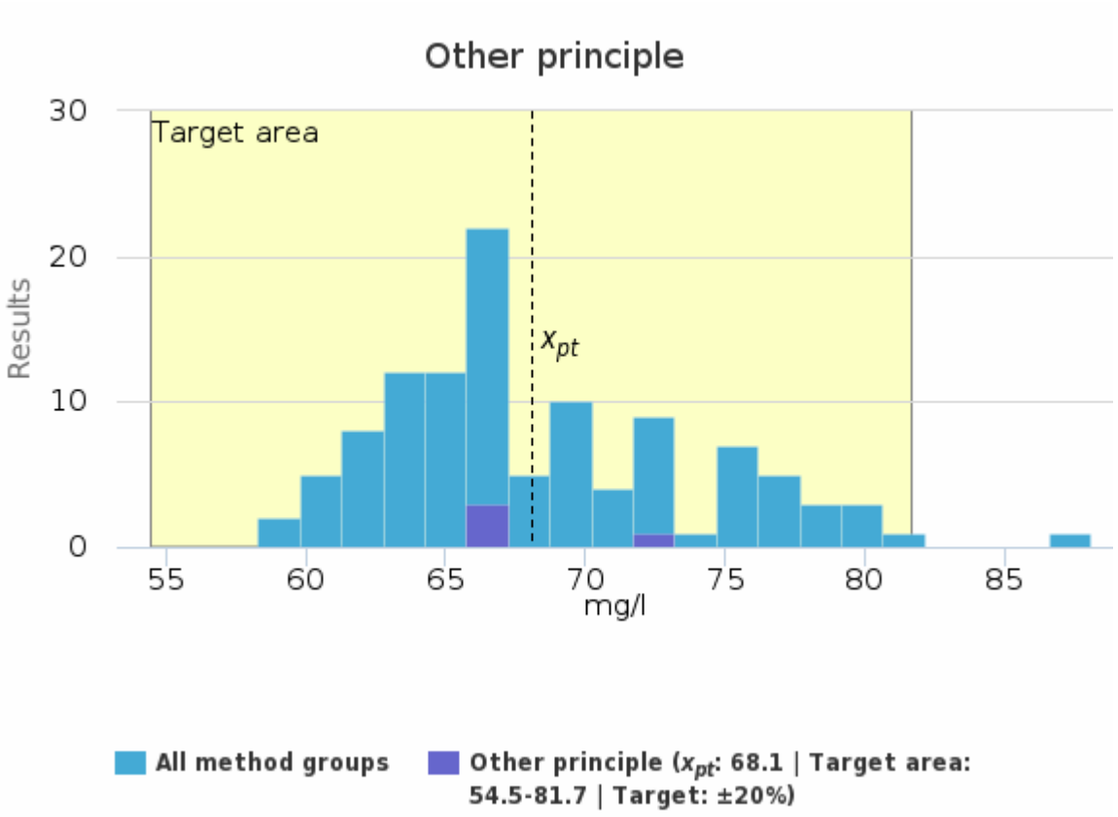
Specimen S002 | U-Alb, mg/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Immunonephelometry	71.2	69.9	4.8	6.7	2.4	67.0	78.1	-	4
Immunoturbidimetry	68.2	66.7	5.4	7.9	0.5	58.3	81.5	1	102
Other principle	68.1	66.6	3.3	4.8	1.7	66.1	73.0	-	4
All	**68.3**	**66.7**	**5.3**	**7.8**	**0.5**	**58.3**	**81.5**	**1**	**110**

Specimen S002 | U-Alb, mg/l| histogram summaries in LabScala



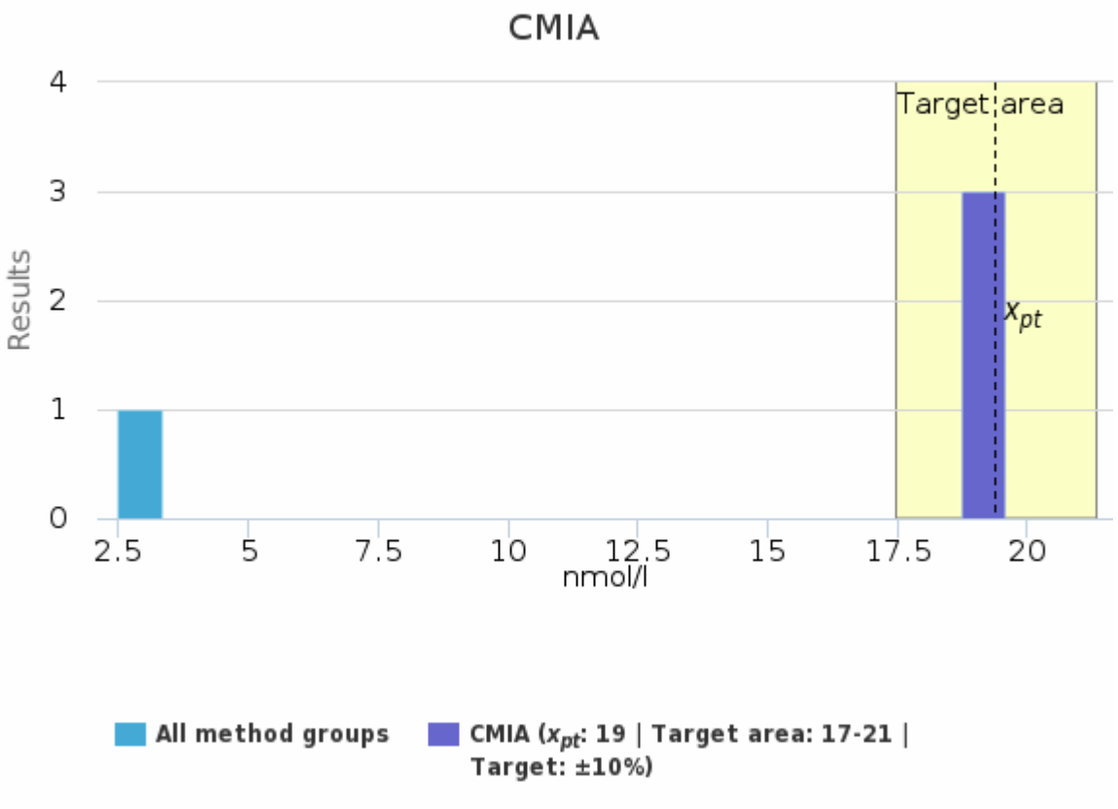


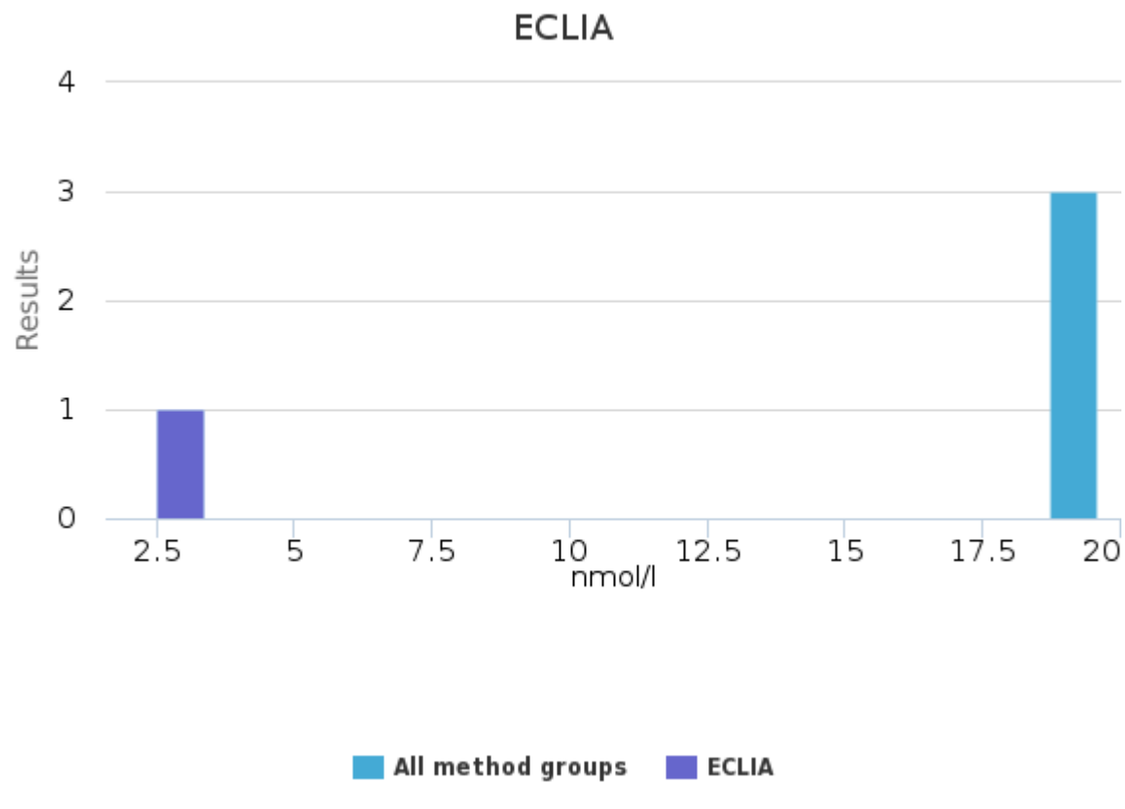


Specimen S002 | U-Cortisol, free, nmol/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
CMIA	19	19	<1	0.8	<1	19	20	-	3
ECLIA	-	-	-	-	-	3	3	-	1
All	**15**	**19**	**8**	**55.7**	**4**	**3**	**20**	**-**	**4**

Specimen S002 | U-Cortisol, free, nmol/l| histogram summaries in LabScala





Report info

Participants

159 participants from 17 countries.

Report info

Your own result should be compared to others using the same method.
Assigned values (x_{pt}, target values) are means of the results where results deviating more than +/- 3*standard deviation from the median are removed. The standard uncertainty (u) of the assigned value is reported as standard error of the mean (SEM). Additionally, if the measurement uncertainty of the target value is large an automatic text is printed on the report: “The uncertainty of the assigned value is not negligible, and evaluations could be affected.”
In case the client’s result is the only one in the method group, no assigned value will be calculated, no target area shown, and no statistics calculated. In case there are only a few results in the client’s own method group, the result can be compared to all method mean or to a group that is similar to the own method.
Results reported with < or > -signs cannot be included in the statistics.

For information on report interpretation and performance evaluation, please see the " EQAS Interpretation guidelines" LabScala User instructions (top right corner ?Help link).

LABQUALITY

External Quality Assessment Scheme

Urine quantitative chemistry
Round 1, 2023

Specimens
Sample S002 (LQ744723012) was liquid human urine. Based on the previous tests and the results of this round, the samples were homogeneous, stable and suitable for the external quality assessment scheme. The materials were sent without temperature control packaging.

Report info
Please see the description of the data analysis on the last page of the laboratory-specific histograms and Numerical Summary reports. It is important to read the Final report first, because it contains important information of the samples and results in each round.

Comments – EQA Coordinator
In this round the following results below or above methods detection limits were reported: in sodium ISE group one <100 mmol/L result and in CMIA group one <28 nmol/L cortisol, free result.

The mean values of all results (Annex, Table 1) were close to the manufacturer´s values and the CV% were low as well. Only all protein and cortisol, free results' CV% were >10. In most of individual method groups the CV% were below 10, except some small groups (n<10) and protein Biuret group (CV 12.6%, n=20).

In the ISE indirect and ISE direct groups of chloride were two distinct peaks seen in the histograms. For this reason, the CV% were higher than usually and respectively 14 and 4 results were out of target areas. This phenomenon we have noticed especially in these groups many times previously when the chloride concentration has been low. The other analytes´ results were mostly in target areas except relative density strip test group results.

The results in this round were good. Few of the participants should have better post-analytics (3 creatinine, 9 uric acid, 1 calcium, 1 magnesium and 4 protein results were reported in wrong units). Quite often the same clients report results in wrong units repeatedly. Everyone should pay attention to report the results in correct units (e.g. 6500 µmol/L=6.5 mmol/L, 300 µmol/L=0,3 mmol/L or 600 mg/L= 0.6 g/L).

Annex
Table 1. The sample manufacturer's values and all output groups´ values from the round 1, 2023.

End of report

2023-04-28

FINAL REPORT

Product no. 3160

Samples sent	2023-04-03
Round closed	2023-04-25
Final report	2023-04-28

Request for correction
Typing errors in laboratory's result forms are on laboratory's responsibility. Labquality accepts responsibility only for result processing. Requests must be notified by writing within three weeks from the date of this letter.

Authorized by
EQA Coordinator
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FINAS
Finnish Accreditation Service
PT02 (EN ISO/IEC 17043)

Quality Management
ISO 9001:2015

Annex

Table 1: The sample manufacturer's values and all output groups´ values from the round 1, 2023 are presented below: mmol/L (osmolality mosm/kg H_2O, albumin mg/L, protein g/L, amylase U/L and cortisol, free nmol/L).

Analyte	Manufacturer's values	All output groups		
		Mean	SD	CV%
U -Na	86	82	2	2.6
U -K	22	22	<1	2.4
U -Cl	90	89	6	7.2
U -Creatinine	6.6	6.4	0.3	4.7
U -P inorganic	6.2	6.0	0.3	5.0
U -Urea	146	136	7	5.1
U -Uric acid	0.37	0.38	0.03	7.3
U -Ca	2.22	2.21	0.07	3.3
U -Protein	0.69	0.64	0.11	17.4
U -Albumin	71.0	68.3	5.3	7.8
U -Glucose	1.36	1.34	0.05	3.6
U -Mg	2.09	1.98	0.10	4.9
U -Osmolality	446	449	10	2.1
U -Amylase	126	117	6	5.3
U- Cortisol, Free	-	15	8	55.7