LABQUALITY

External Quality Assessment Scheme

Proteins, immunochemical determinations, Round 1, 2023

Specimens
Please find enclosed 2 human serum samples S001 and S002, each 1 mL.

Caution
Quality control specimens derived from human blood must be handled with the same care as patient samples, i.e. as potential transmitters of serious diseases. The specimens are found to be HBsAg, HCVAb and HIVAgAb negative when tested with licensed reagents, but no known test method can offer complete assurance that the specimens will not transmit these or other infectious diseases.

Examinations
A1-Acid Glycoprotein/Orosomucoid
A1-Antitrypsin
A2-Macroglobulin
Albumin
Ceruloplasmin
Complement C3 (C3c)
Complement C4 (C4c)
Haptoglobin
Hemopexin
IgA
IgG
IgLcKappa, total
IgLcLambda, total
IgLcKappa/Lambda, total
IgLcKappa, free
IgLcLambda,free
IgLcKappa/Lambda, free
IgM
Prealbumin/Transthyretin
Retinol Binding Protein
Transferrin
Transferrin receptor

Storage and use
The samples are ready to use, and they stable at 2...8 °C during the whole round processing time. Let the samples reach room temperature before analysis. Ensure homogeneity by gently inverting the sample. Analyse as patient sample.

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.

S001:

S002:

2023-01-23

INSTRUCTIONS

Product no. 2230
LQ735523011-012/UK

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

---

The results should be reported no later than **February 13, 2023.**

Inquiries
EQA Coordinator
Päivi Ranta
paivi.ranta@labquality.fi

Labquality Oy
Kumpulantie 15
FI-00520 HELSINKI
Finland

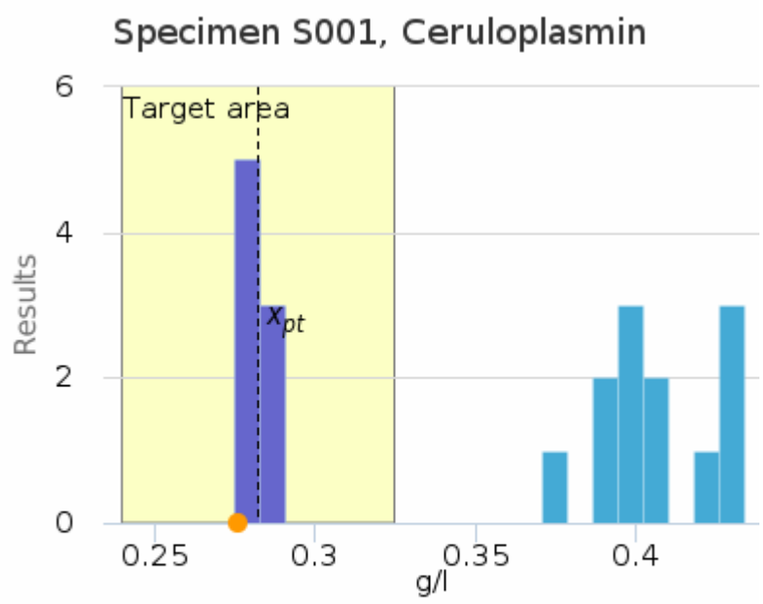
Tel. + 358 9 8566 8200
Fax + 358 9 8566 8280

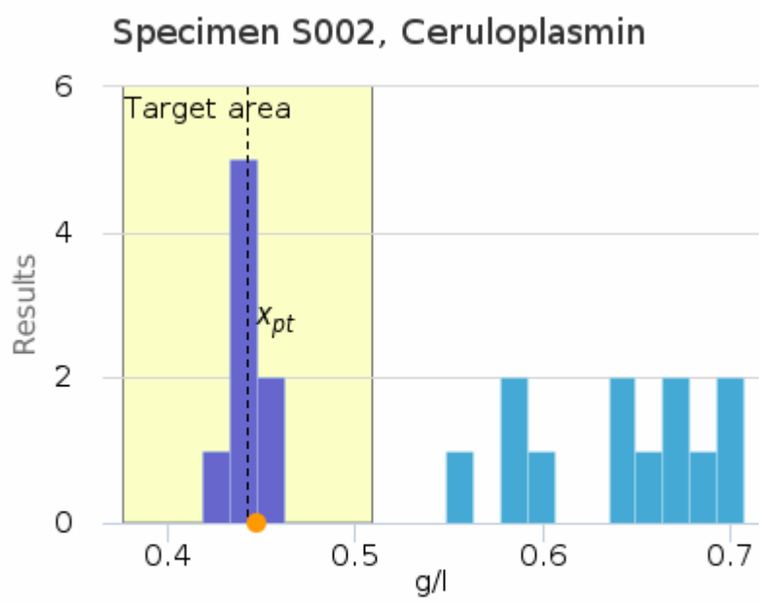
info@labquality.fi
www.labquality.com

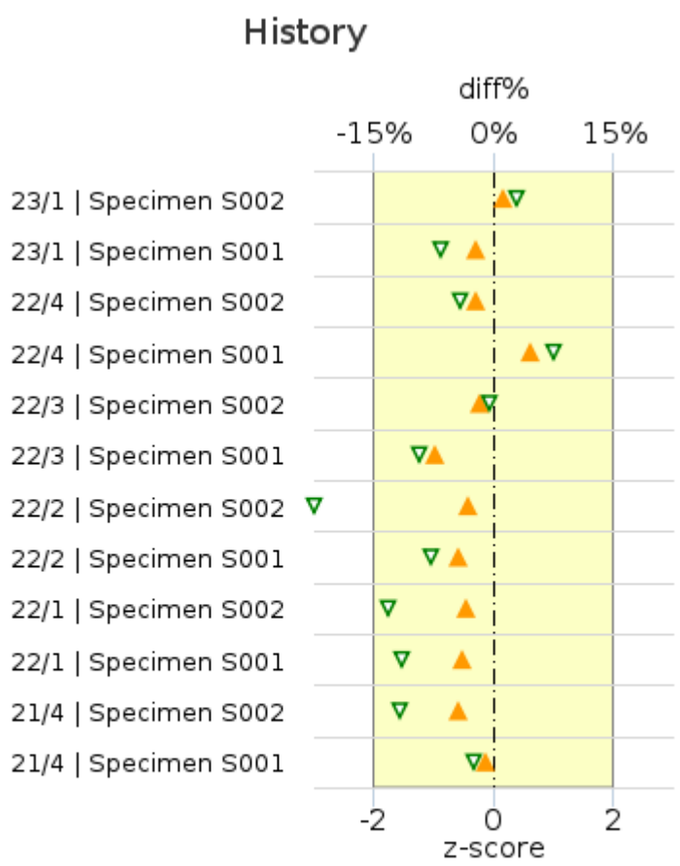
FINAS
Finnish Accreditation Service
PT02 (EN ISO/IEC 17043)

Quality Management
ISO 9001:2015

Ceruloplasmin |Cobas c702







	x_{pt}	sd	SEM	CV%	n
Roche, turbidimetry, Ceruloplasmin	0.282 g/l	0.007	0.002	2.4	8
All methods	0.357 g/l	0.064	0.014	18.0	20

	x_{pt}	sd	SEM	CV%	n
Roche, turbidimetry, Ceruloplasmin	0.442 g/l	0.012	0.004	2.7	8
All methods	0.562 g/l	0.108	0.024	19.1	20

Round	Sample	x_{pt}	Result	diff%	z-score
23/1	Specimen S002	0.442	0.447	1.057%	0.38
23/1	Specimen S001	0.282	0.276	-2.132%	-0.89
22/4	Specimen S002	0.228	0.223	-2.193%	-0.54
22/4	Specimen S001	0.206	0.216	4.727%	1.02
22/3	Specimen S002	0.252	0.248	-1.587%	-0.08
22/3	Specimen S001	0.158	0.146	-7.302%	-1.22
22/2	Specimen S002	0.379	0.367	-3.134%	-7.23
22/2	Specimen S001	0.155	0.148	-4.310%	-1.05
22/1	Specimen S002	0.250	0.241	-3.471%	-1.76
22/1	Specimen S001	0.234	0.225	-4.028%	-1.52
21/4	Specimen S002	0.196	0.187	-4.375%	-1.56
21/4	Specimen S001	0.252	0.250	-0.968%	-0.31

Report info

Participants

63 participants from 17 countries.

Report info

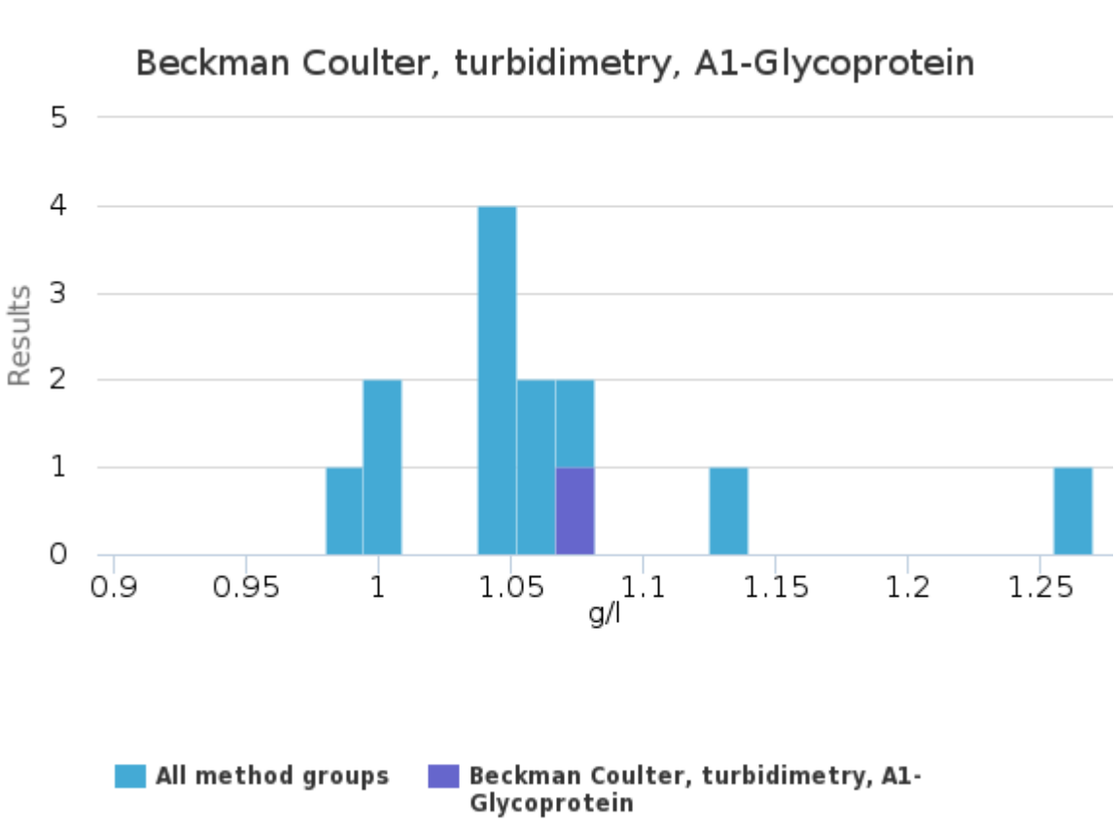
Your own result should be compared to others using the same method.
Assigned values (x_{pt}, target values) are means of the results where results deviating more than +/- 3*standard deviation from the median are removed. The standard uncertainty (u) of the assigned value is reported as standard error 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.

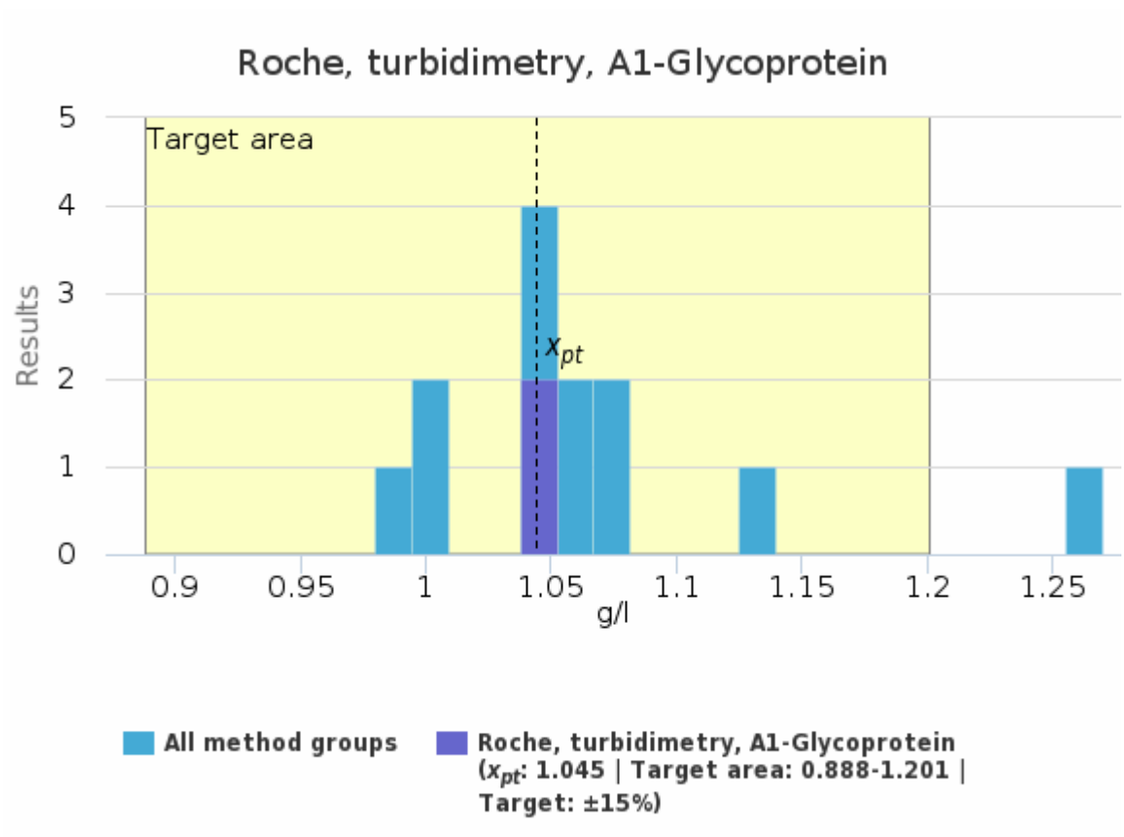
For information on report interpretation and performance evaluation, please see the " EQAS Interpretation guidelines" LabScala User instructions (top right corner ?Help link).

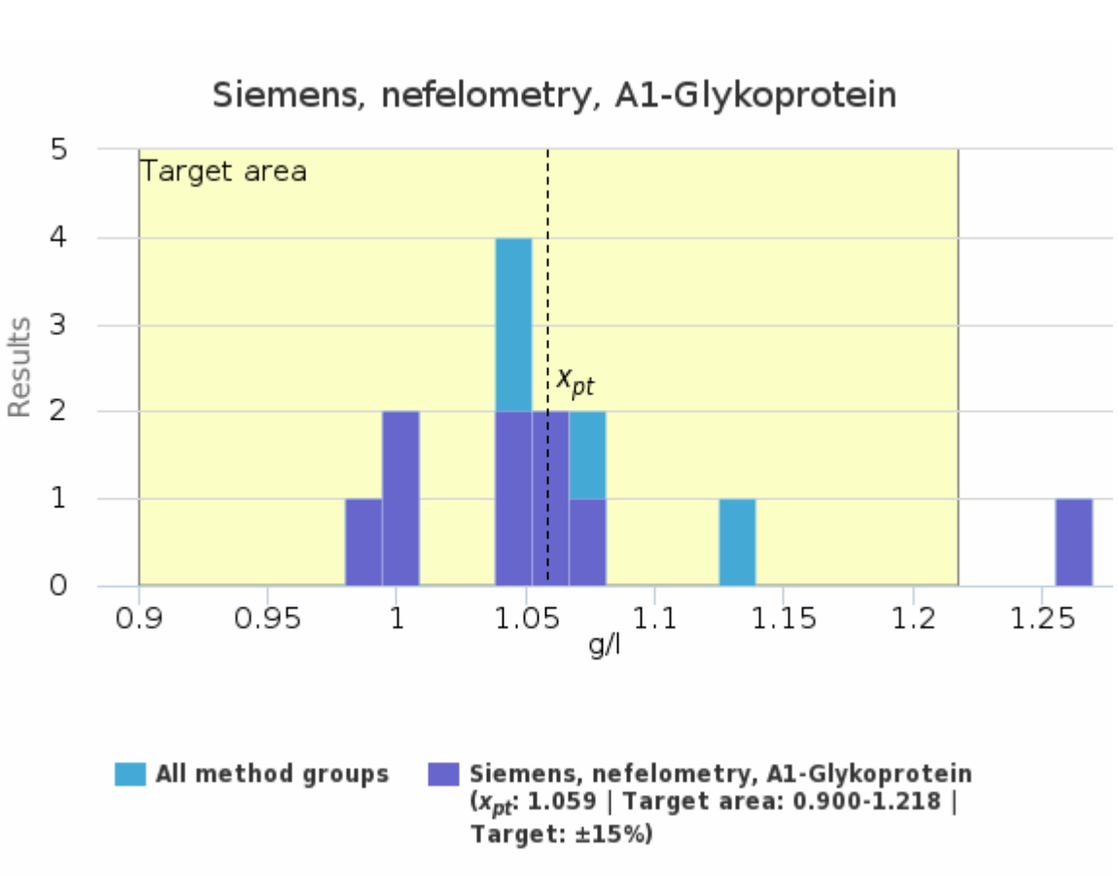
Specimen S001 | A1-Glykoprotein, g/l

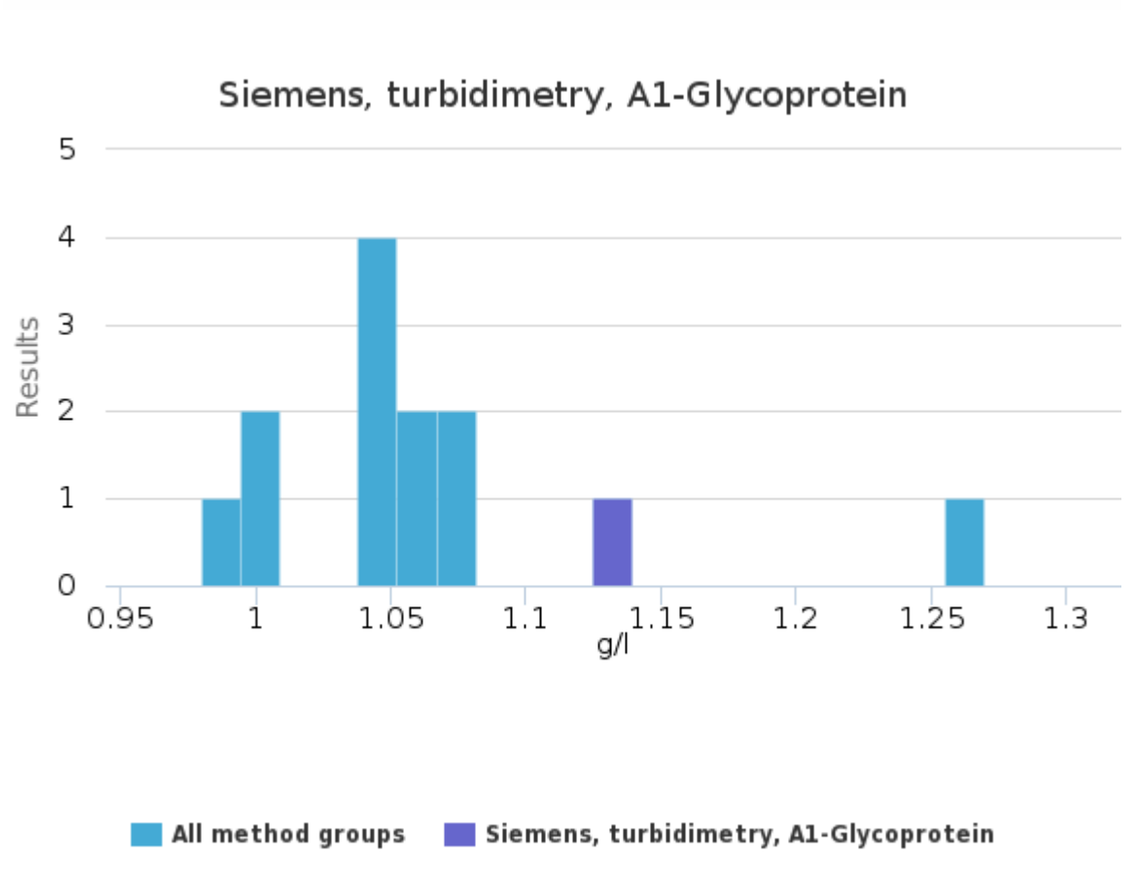
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Beckman Coulter, turbidimetry, A1-Glycoprotein	-	-	-	-	-	1.070	1.070	-	1
Roche, turbidimetry, A1-Glycoprotein	1.045	1.045	0.006	0.6	0.005	1.040	1.049	-	2
Siemens, nefelometry, A1-Glykoprotein	1.059	1.050	0.085	8.1	0.028	0.980	1.270	-	9
Siemens, turbidimetry, A1-Glycoprotein	-	-	-	-	-	1.130	1.130	-	1
All	**1.046**	**1.050**	**0.040**	**3.8**	**0.011**	**0.980**	**1.130**	**1**	**13**

Specimen S001 | A1-Glykoprotein, g/l| histogram summaries in LabScala





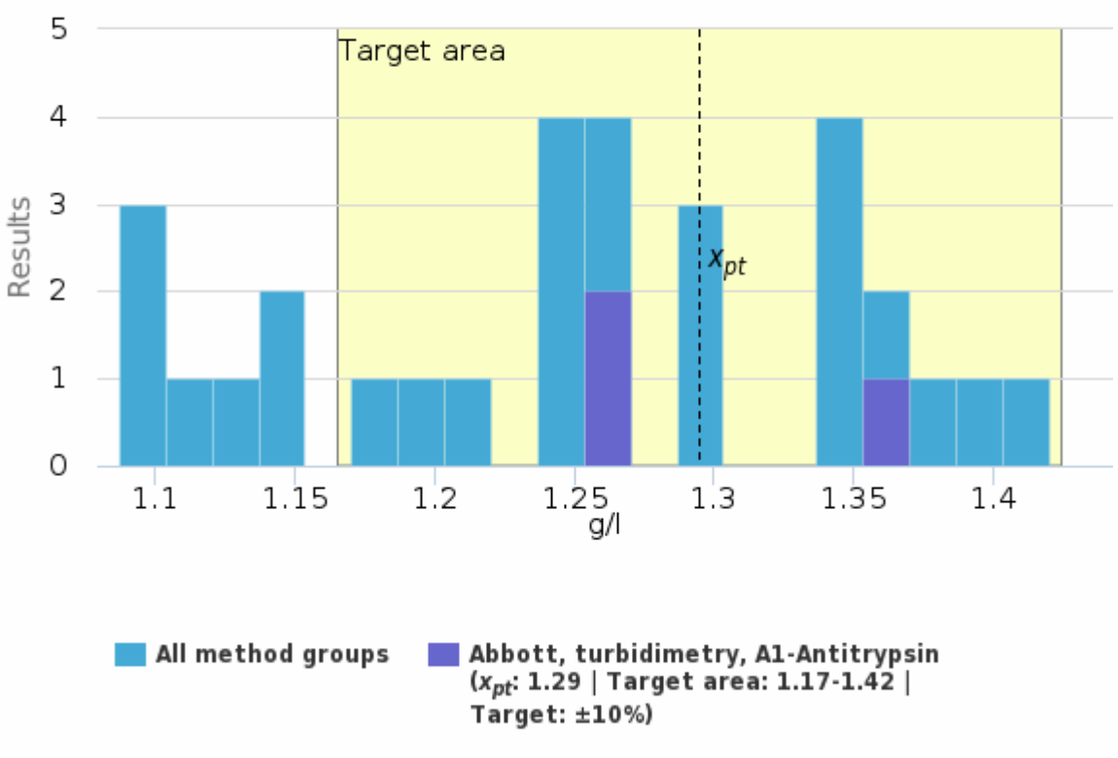


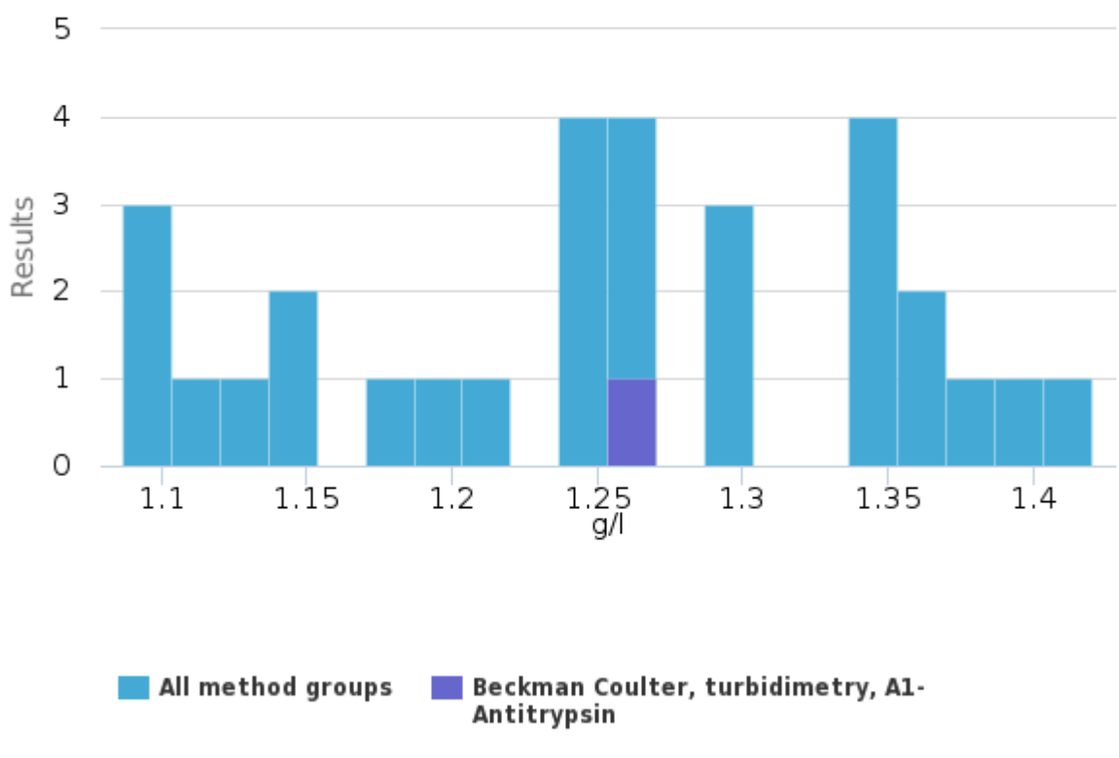


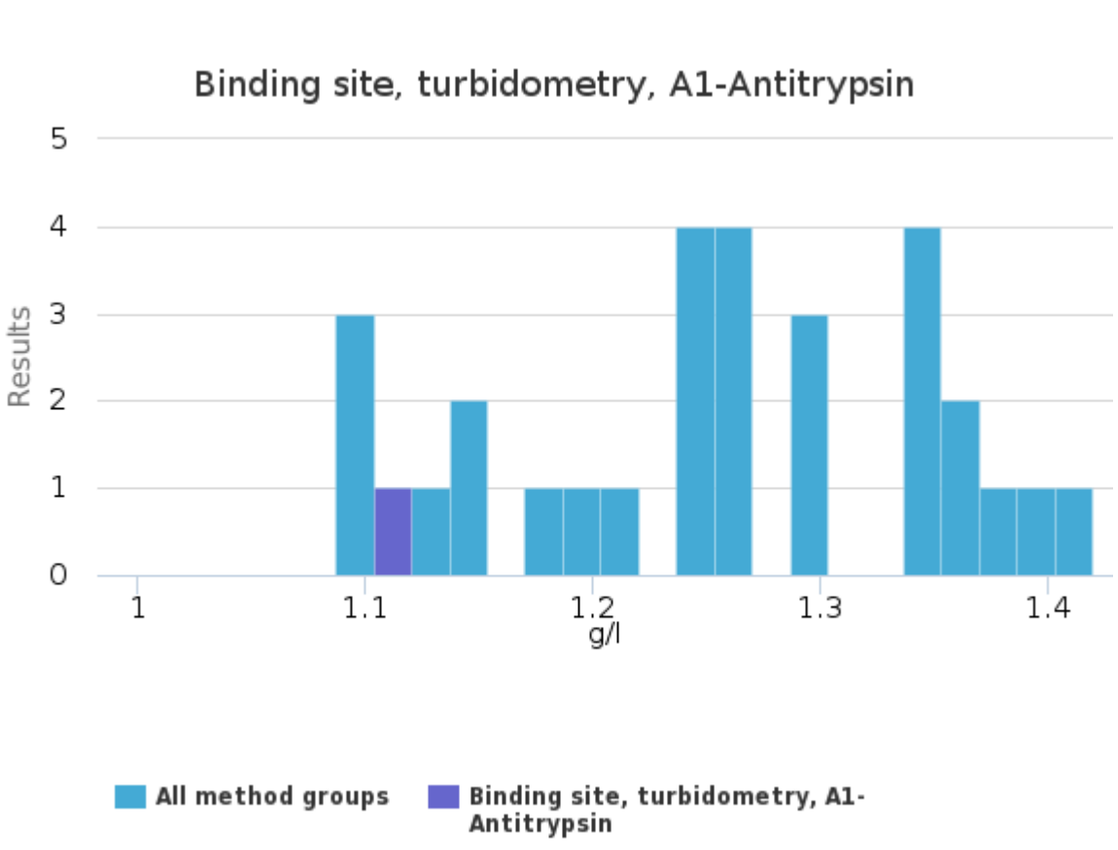
Specimen S001 | A1-Antitrypsin, g/l

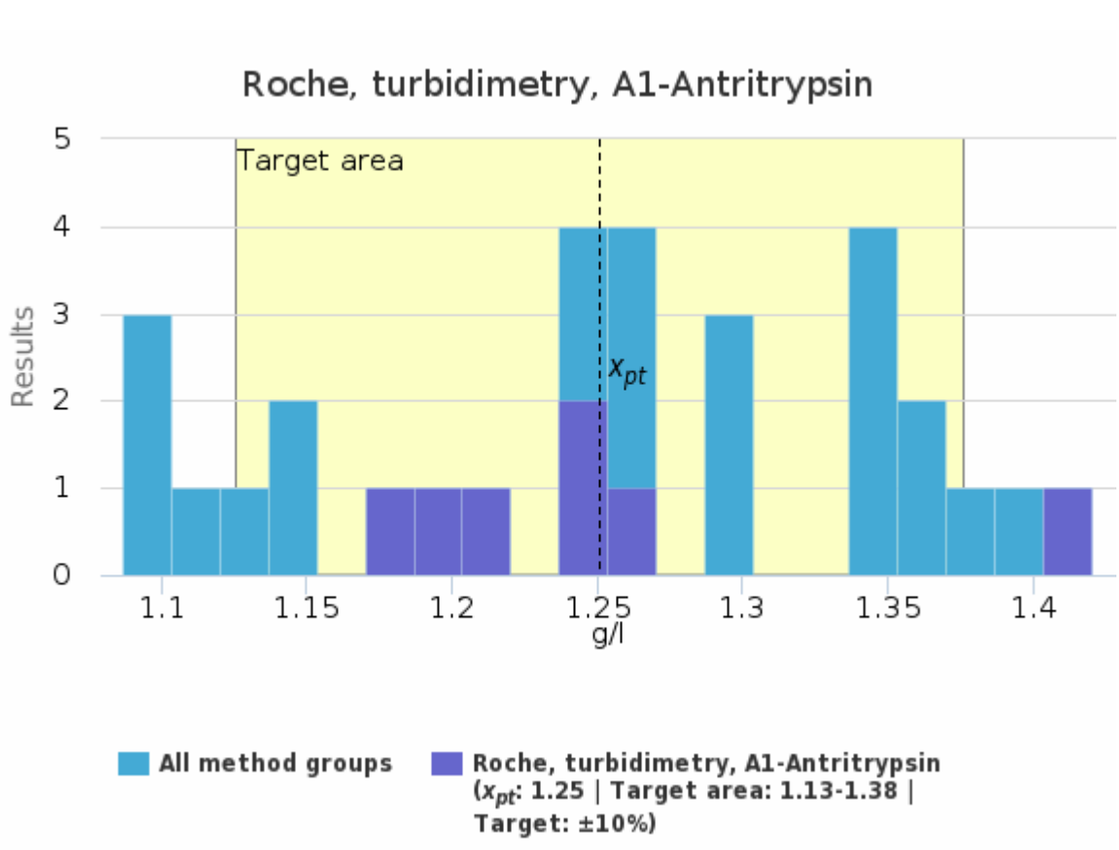
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, A1-Antitrypsin	1.29	1.26	0.06	4.6	0.03	1.26	1.36	-	3
Beckman Coulter, turbidimetry, A1-Antitrypsin	-	-	-	-	-	1.26	1.26	-	1
Binding site, turbidometry, A1-Antitrypsin	-	-	-	-	-	1.11	1.11	-	1
Roche, turbidimetry, A1-Antritrypsin	1.25	1.24	0.08	6.5	0.03	1.18	1.42	-	7
Siemens, nefelometry, A1-Antitrypsin	1.31	1.34	0.07	5.4	0.02	1.14	1.40	-	13
Siemens, turbidimetry, A1-Antitrypsin	1.11	1.10	0.03	2.4	0.01	1.09	1.15	-	5
All	**1.25**	**1.26**	**0.10**	**7.8**	**0.02**	**1.09**	**1.42**	**-**	**30**

Specimen S001 | A1-Antitrypsin, g/l| histogram summaries in LabScala



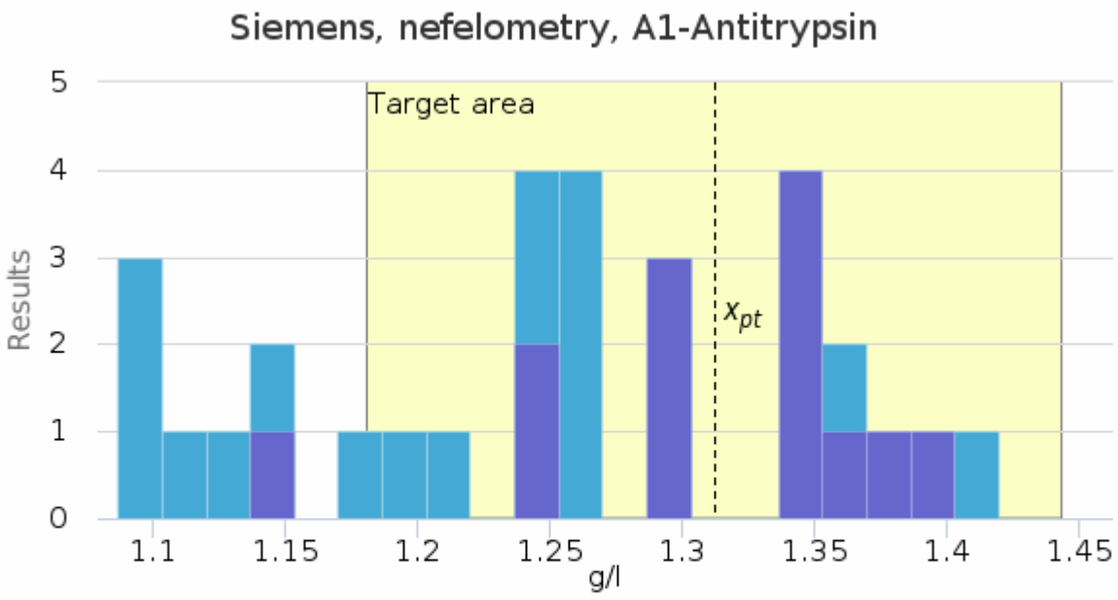


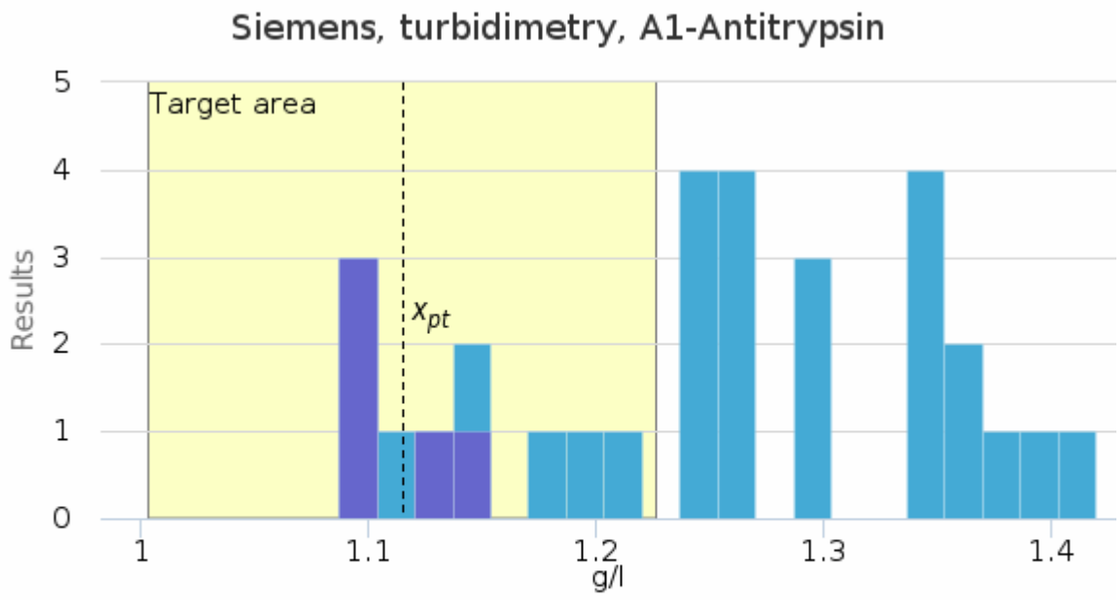




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

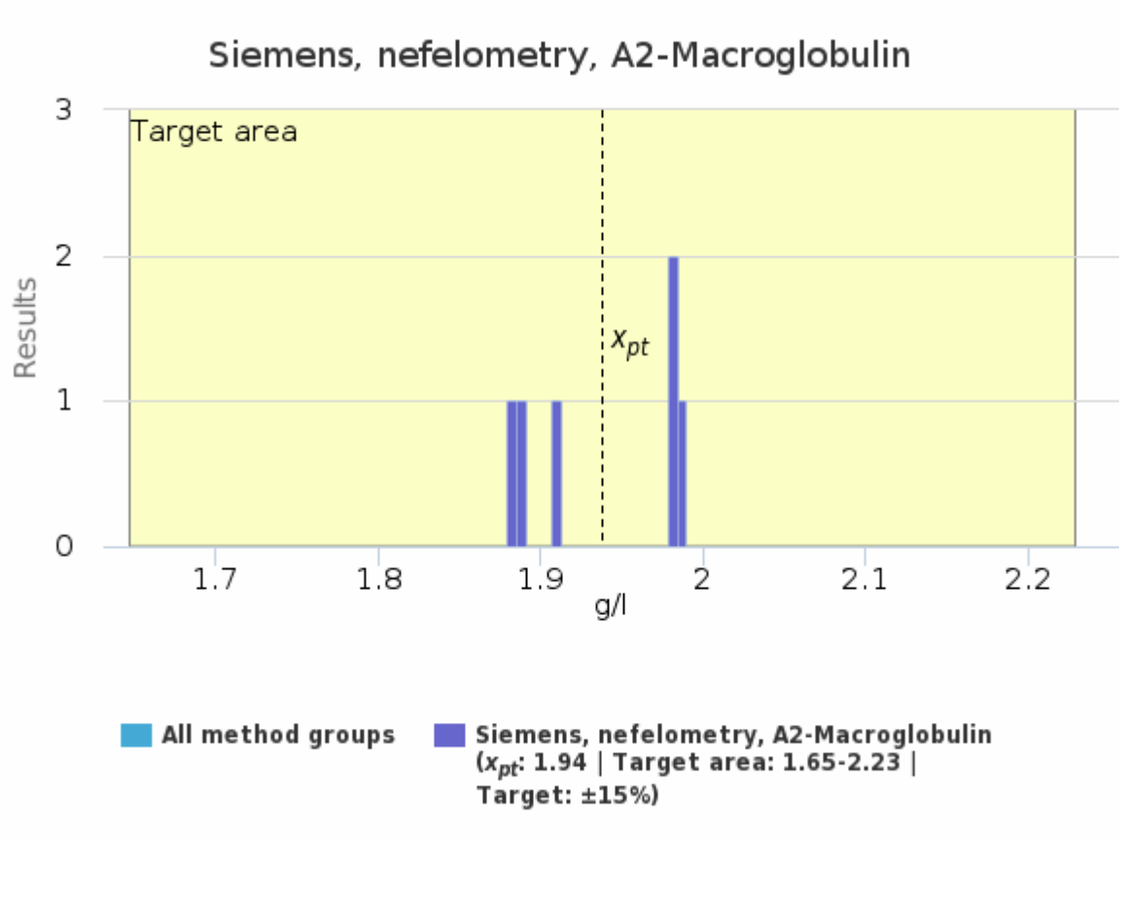




Specimen S001 | A2-Makroglobulin, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Siemens, nefelometry, A2-Macroglobulin	1.94	1.95	0.05	2.6	0.02	1.88	1.99	-	6
All	**1.94**	**1.95**	**0.05**	**2.6**	**0.02**	**1.88**	**1.99**	**-**	**6**

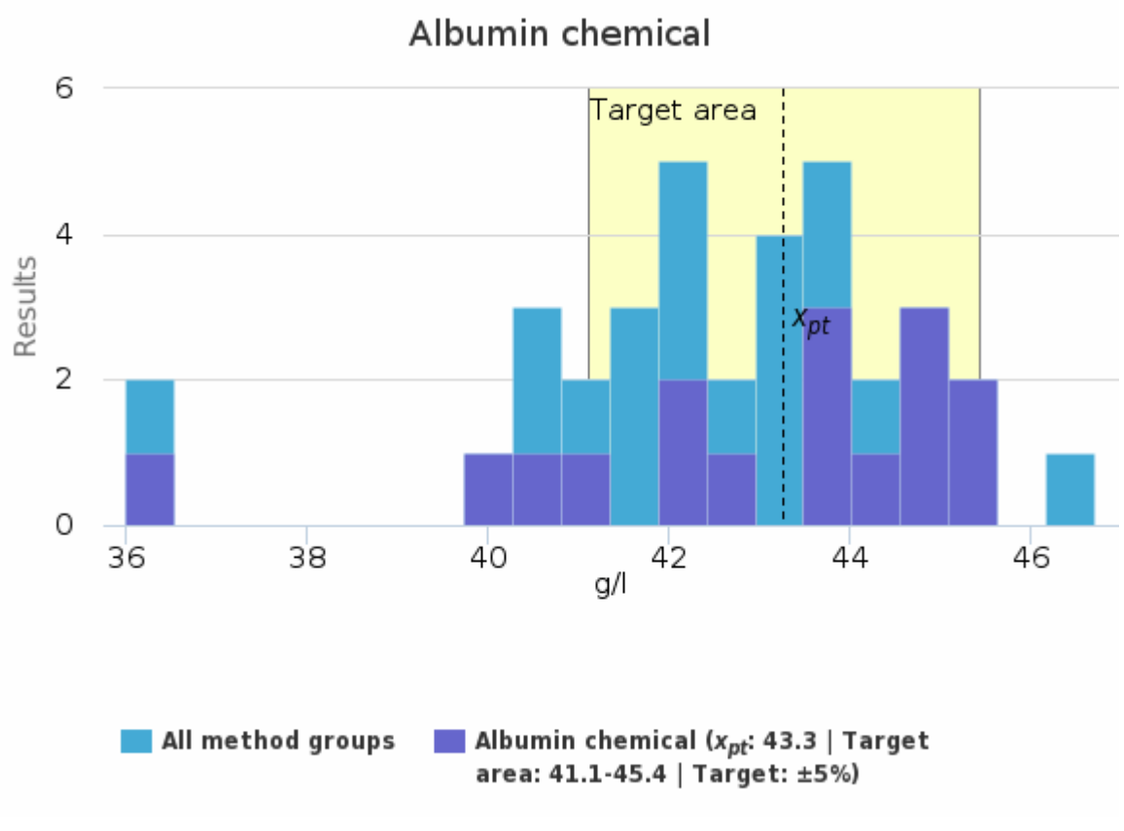
Specimen S001 | A2-Makroglobulin, g/l| histogram summaries in LabScala

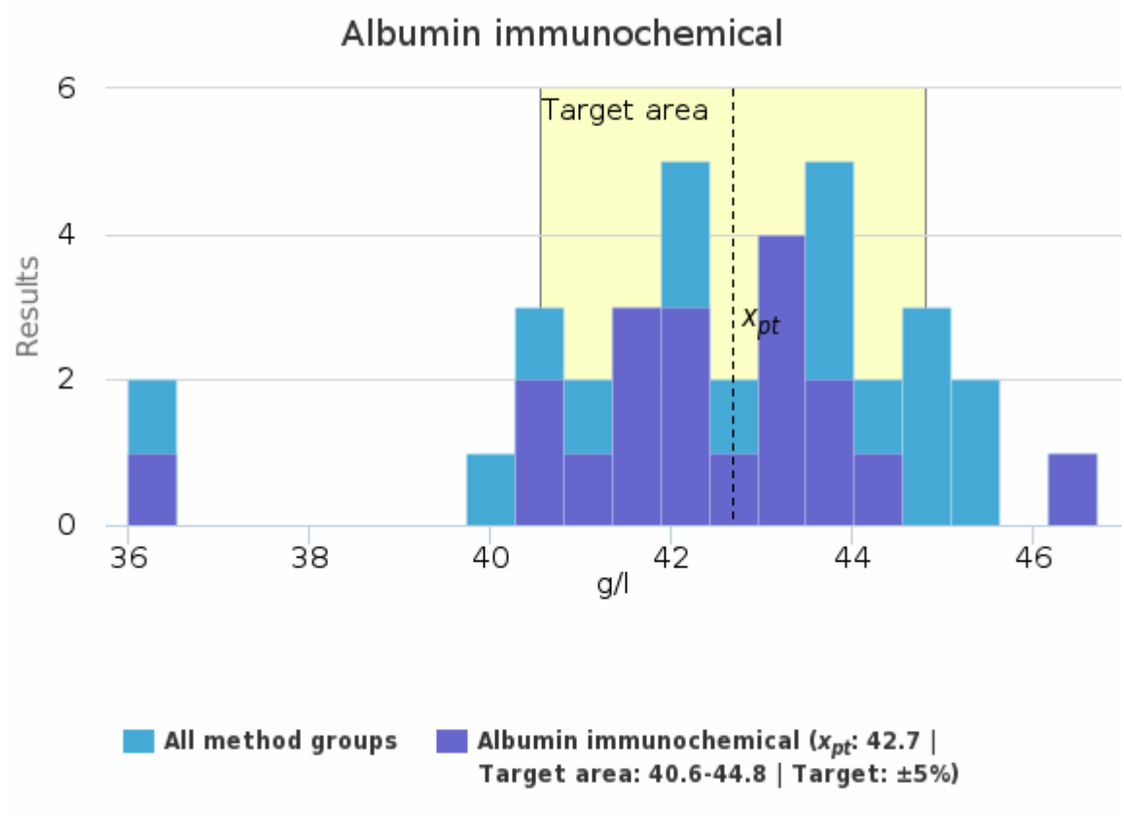


Specimen S001 | Albumin, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Albumin chemical	43.3	44.0	1.8	4.2	0.5	40.0	45.3	1	16
Albumin immunochemical	42.7	42.6	1.5	3.5	0.4	40.5	46.7	1	19
All	**42.6**	**42.7**	**2.3**	**5.4**	**0.4**	**36.0**	**46.7**	**-**	**35**

Specimen S001 | Albumin, g/l| histogram summaries in LabScala

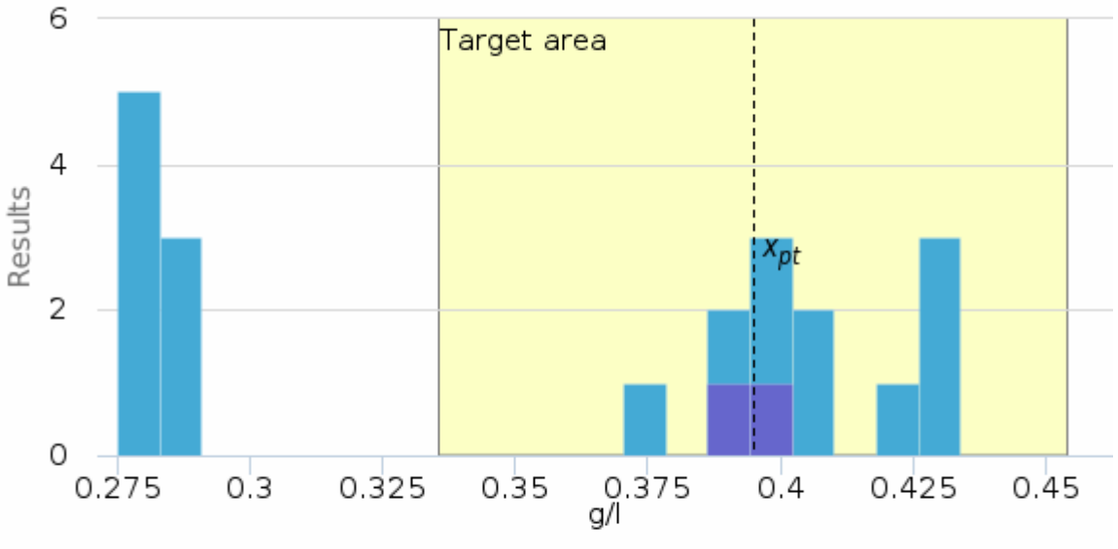


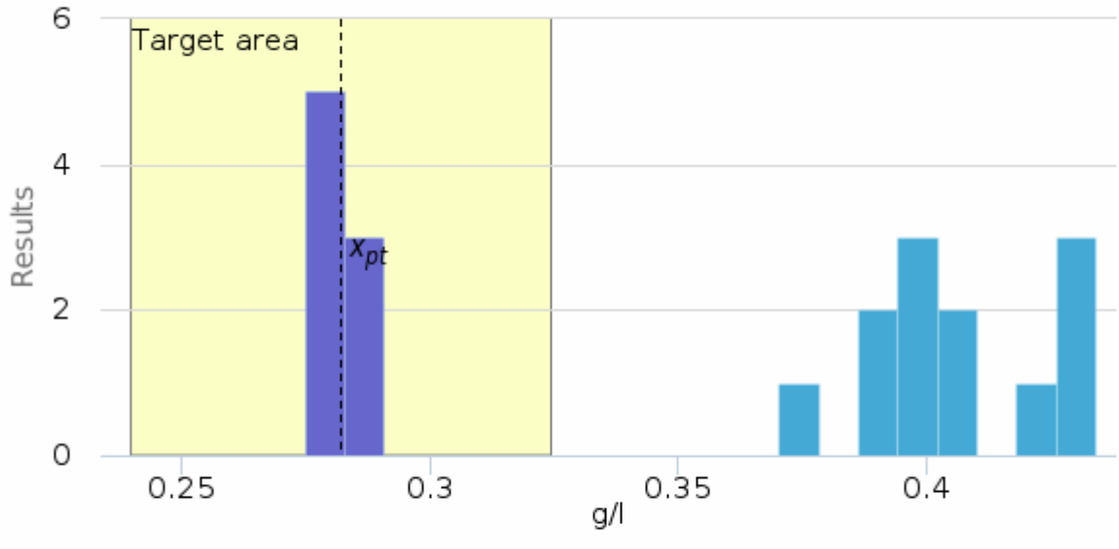


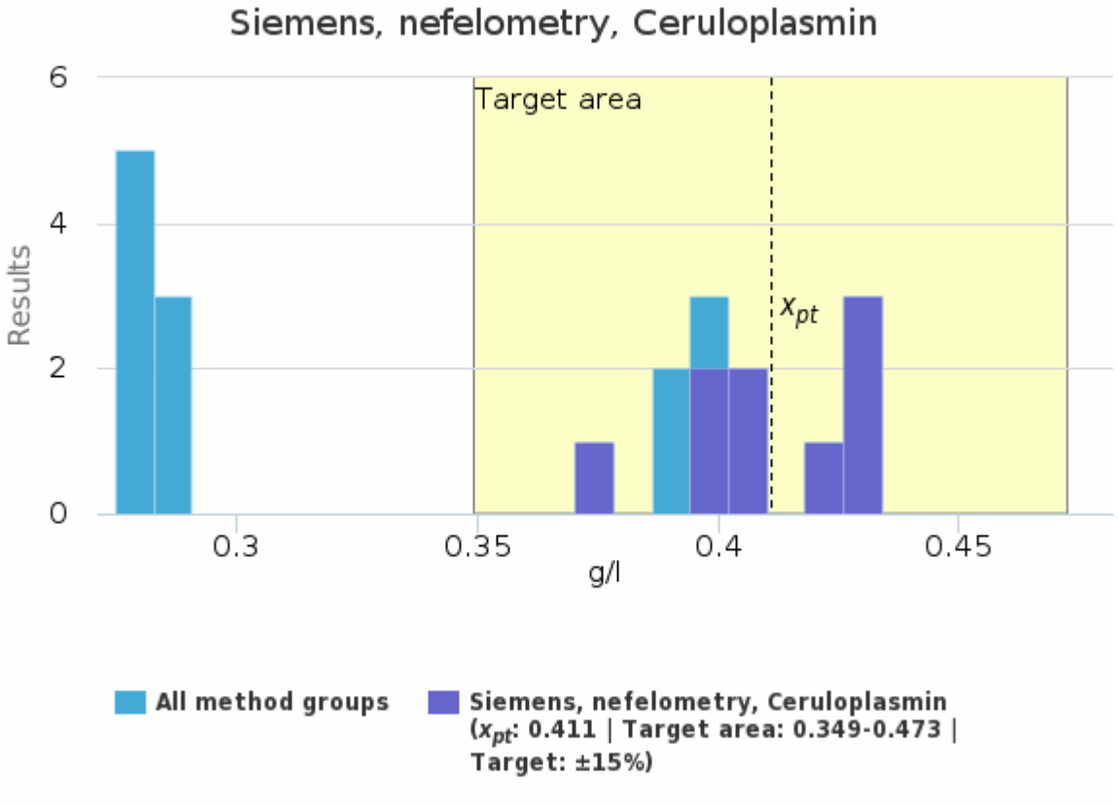
Specimen S001 | Ceruloplasmin, g/l

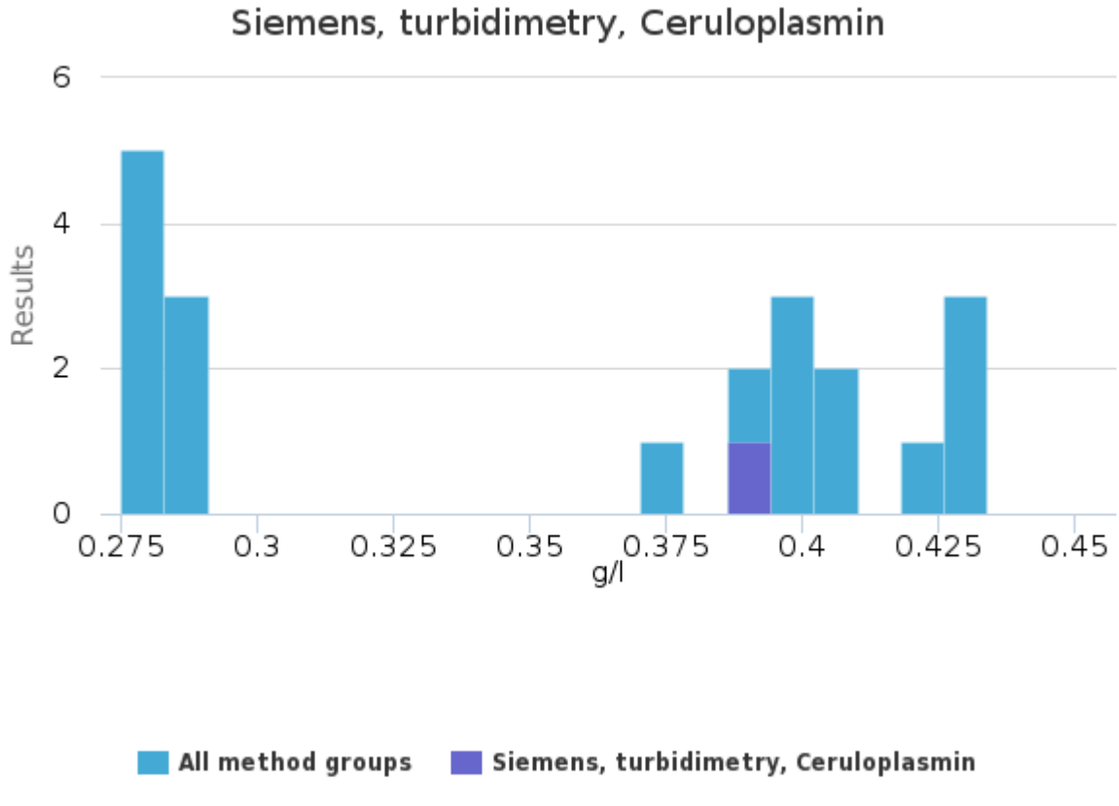
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Ceruloplasmin	0.395	0.395	0.007	1.8	0.005	0.390	0.400	-	2
Roche, turbidimetry, Ceruloplasmin	0.282	0.279	0.007	2.4	0.002	0.275	0.290	-	8
Siemens, nefelometry, Ceruloplasmin	0.411	0.405	0.019	4.7	0.006	0.375	0.434	-	9
Siemens, turbidimetry, Ceruloplasmin	-	-	-	-	-	0.390	0.390	-	1
All	**0.357**	**0.390**	**0.064**	**18.0**	**0.014**	**0.275**	**0.434**	**-**	**20**

Specimen S001 | Ceruloplasmin, g/l| histogram summaries in LabScala







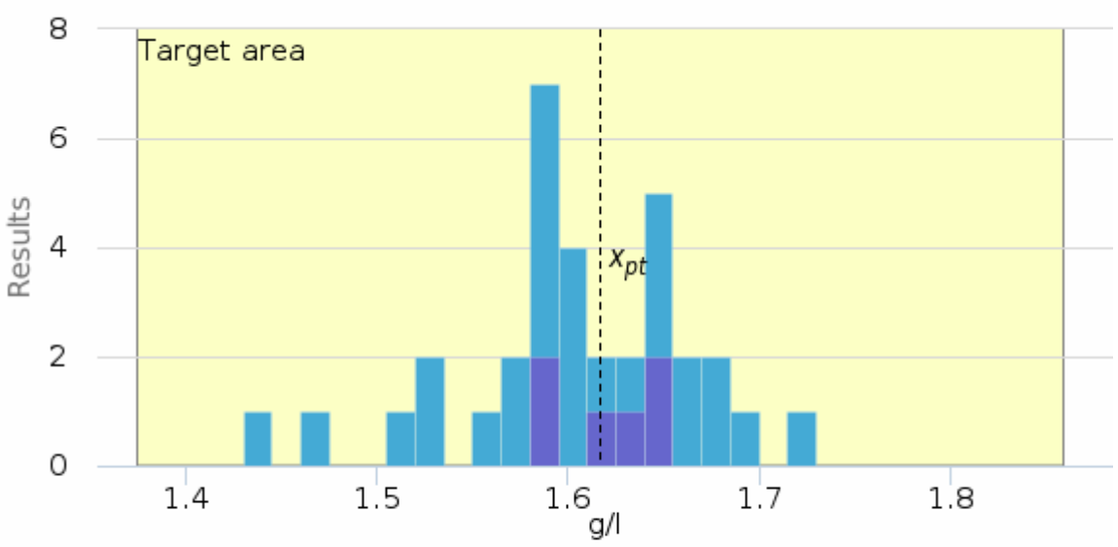


Specimen S001 | Complement C3, g/l

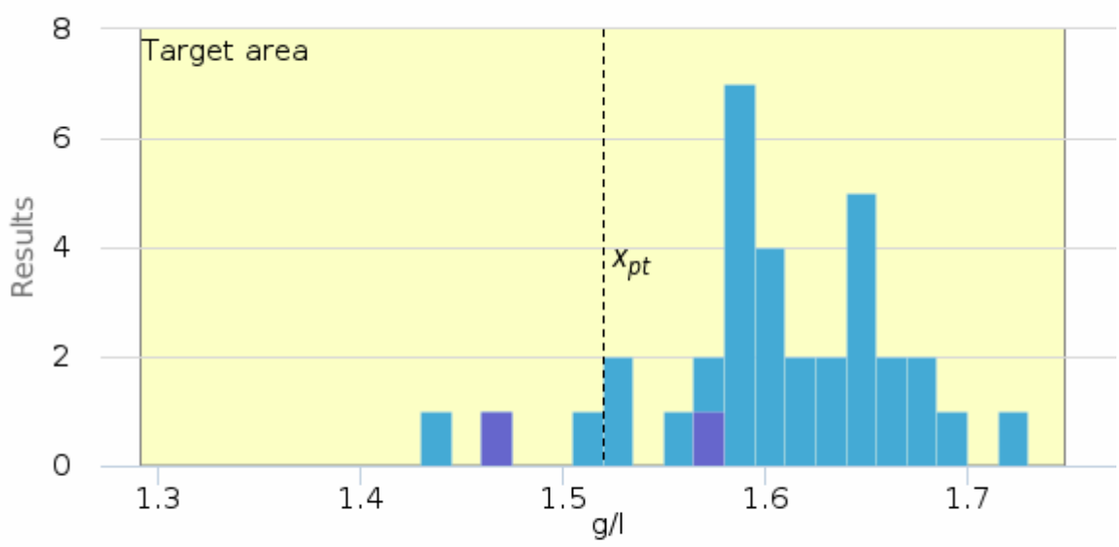
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, C3	1.617	1.620	0.023	1.4	0.010	1.590	1.640	-	6
Beckman Coulter, turbidimetry, C3	1.520	1.520	0.071	4.7	0.050	1.470	1.570	-	2
Roche, turbidimetry, C3	1.635	1.649	0.064	3.9	0.021	1.520	1.730	-	9
Siemens, nefelometry, C3	1.598	1.600	0.065	4.1	0.018	1.430	1.680	-	13
Siemens, turbidimetry, C3	1.570	1.570	0.060	3.8	0.035	1.510	1.630	-	3
Thermo Scientific, turbidimetry, C3	-	-	-	-	-	1.560	1.560	-	1
All	**1.603**	**1.600**	**0.062**	**3.9**	**0.011**	**1.430**	**1.730**	**-**	**34**

Specimen S001 | Complement C3, g/l| histogram summaries in LabScala

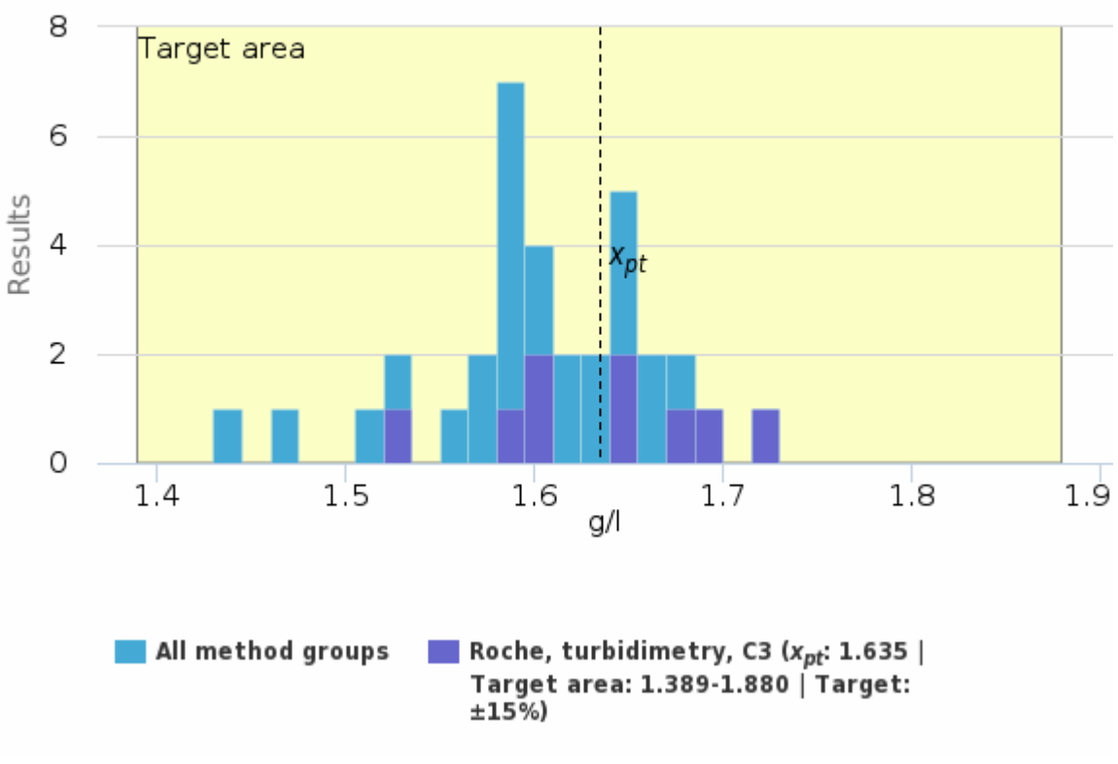
Abbott, turbidimetry, C3



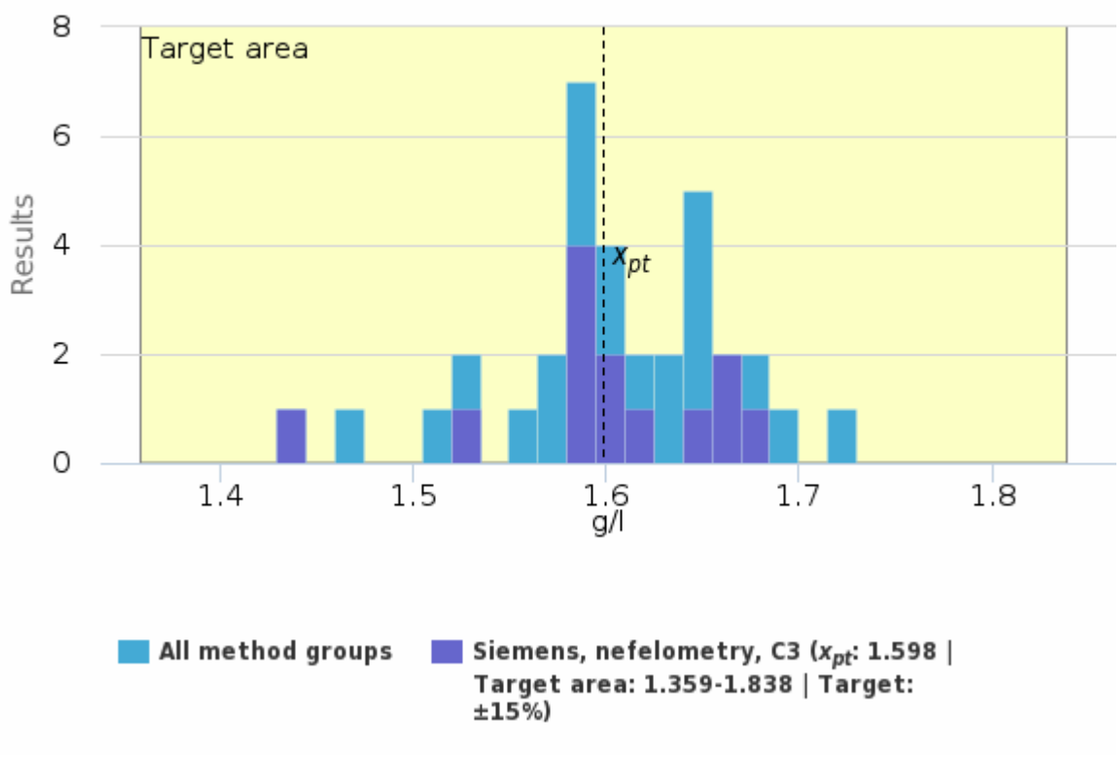
Beckman Coulter, turbidimetry, C3



Roche, turbidimetry, C3

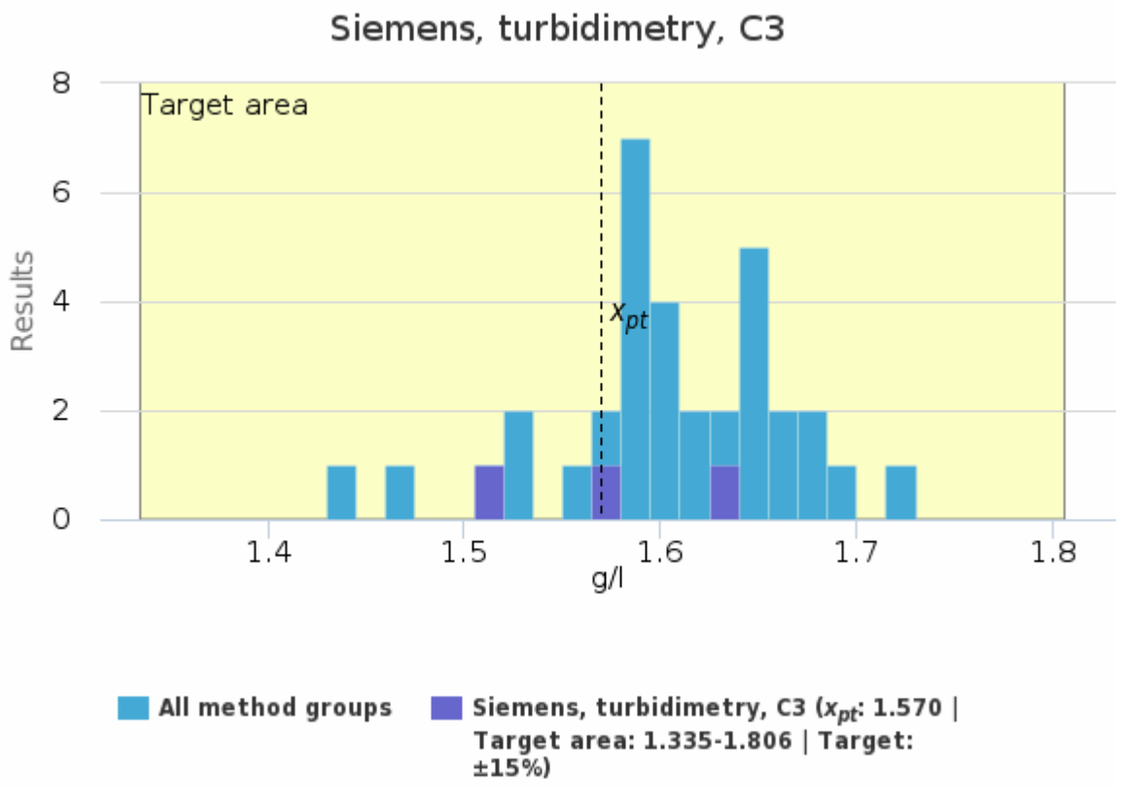


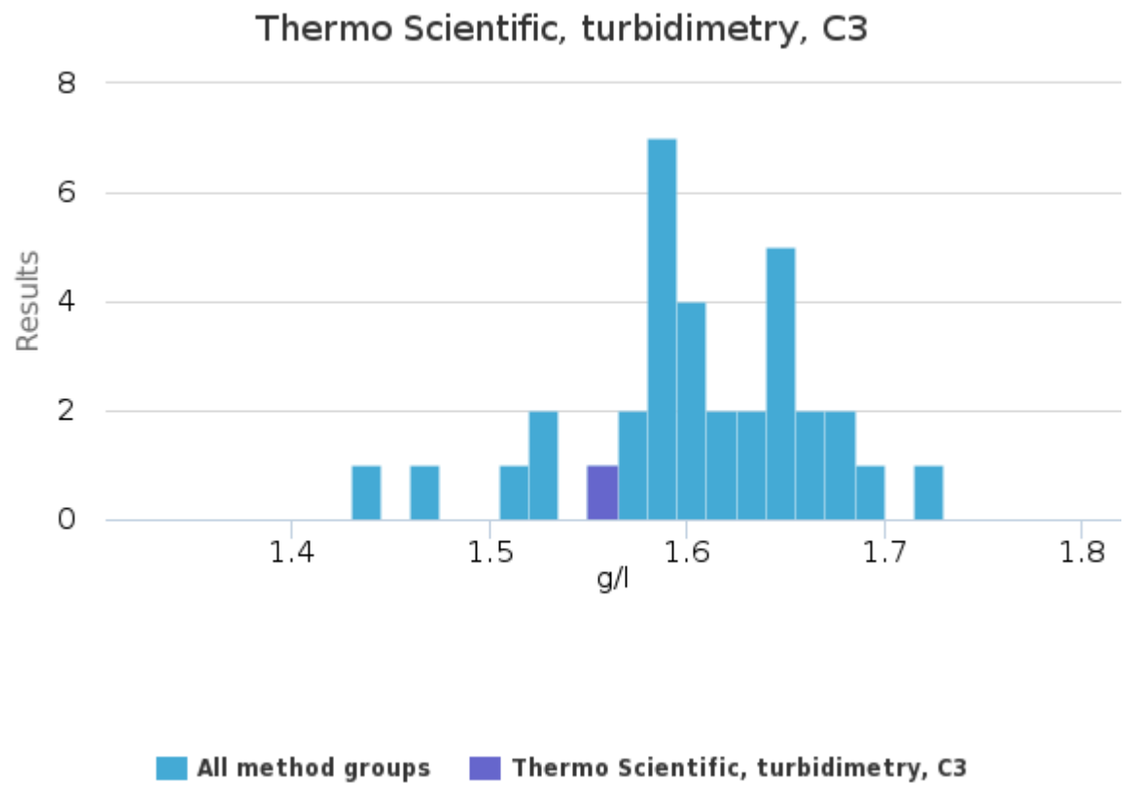
Siemens, nefelometry, C3



Proteins, immunochemical determinations, January, 1-2023

Quantitative report

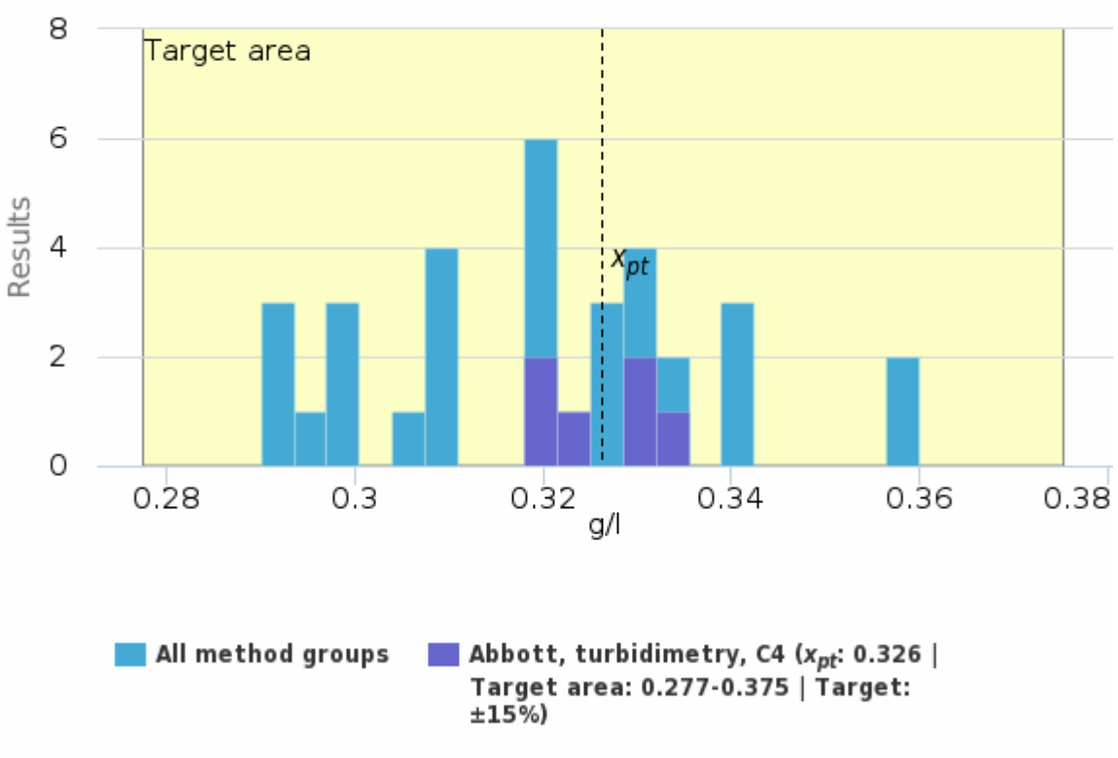


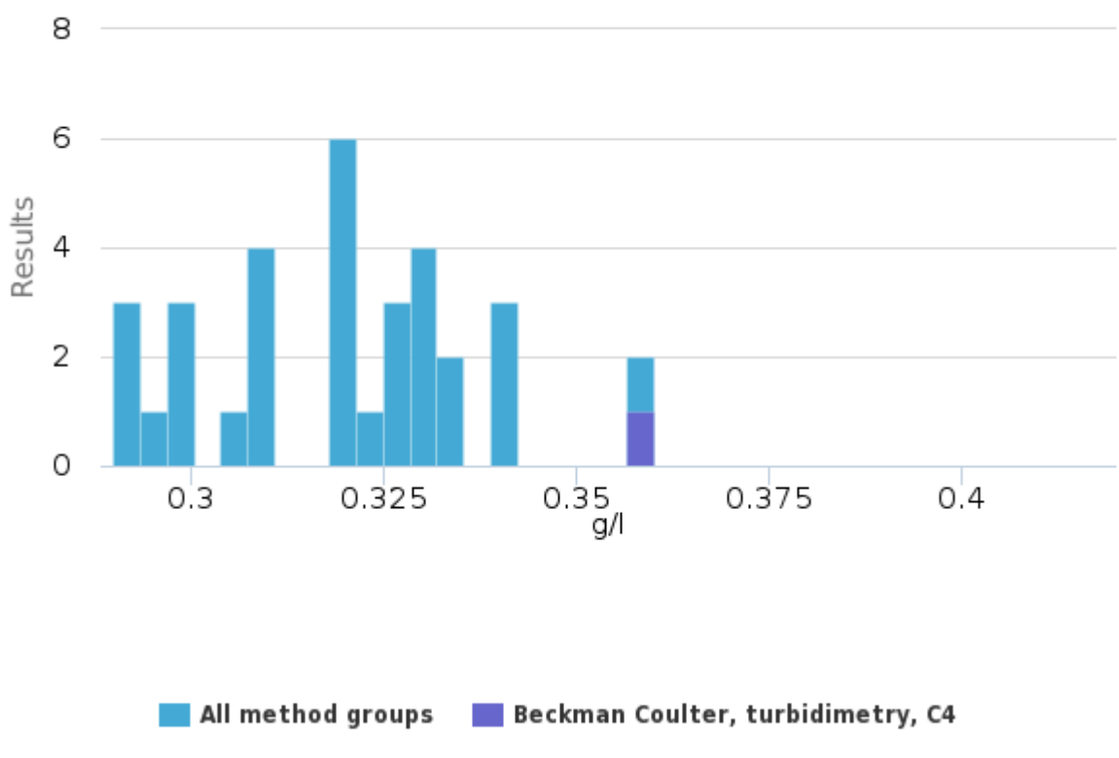


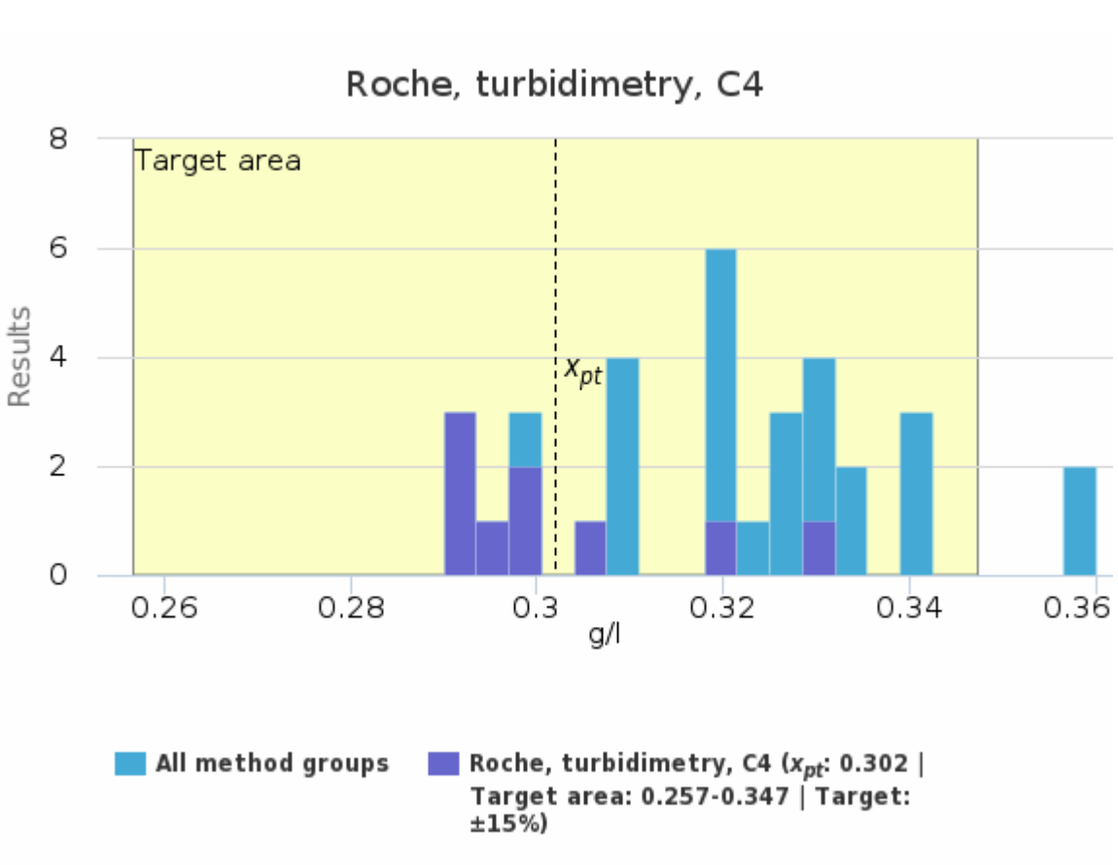
Specimen S001 | Complement C4, g/l

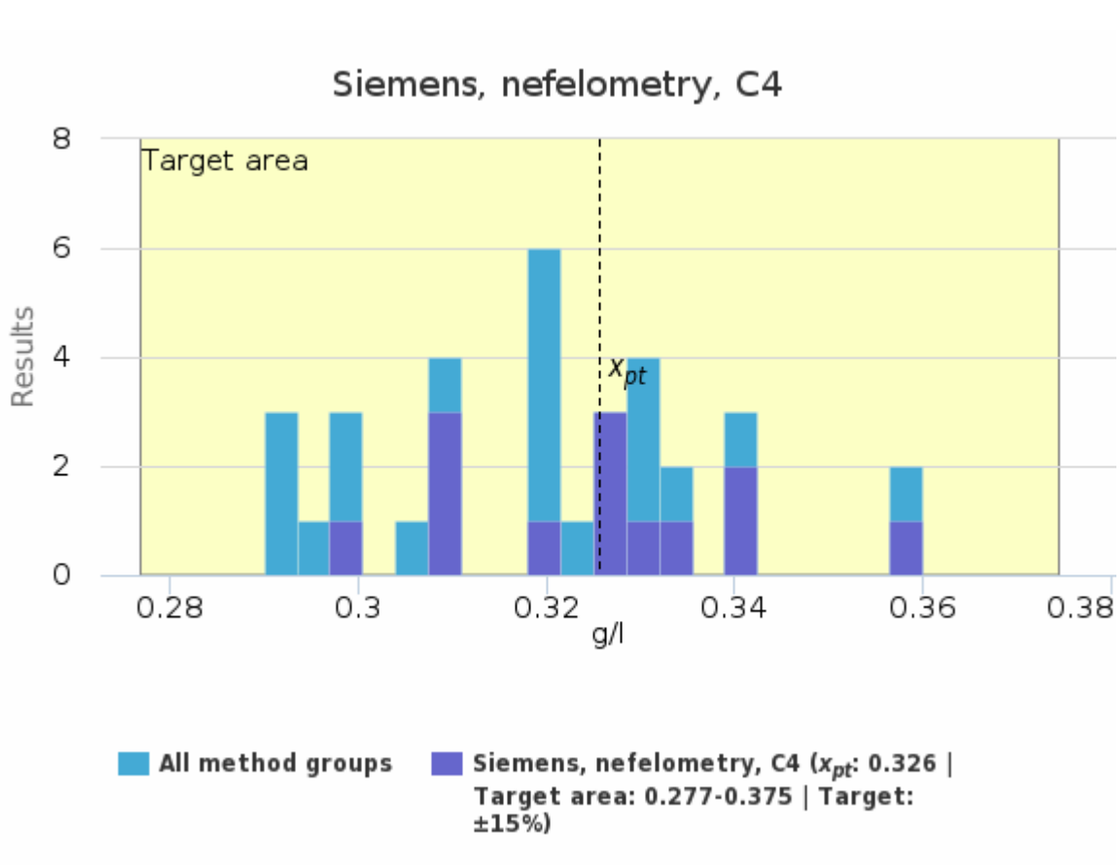
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, C4	0.326	0.327	0.006	1.8	0.002	0.320	0.334	-	6
Beckman Coulter, turbidimetry, C4	-	-	-	-	-	0.360	0.360	-	1
Roche, turbidimetry, C4	0.302	0.300	0.014	4.6	0.005	0.290	0.330	-	9
Siemens, nefelometry, C4	0.326	0.328	0.016	5.0	0.005	0.300	0.360	-	13
Siemens, turbidimetry, C4	0.317	0.320	0.006	1.8	0.003	0.310	0.320	-	3
Thermo Scientific, turbidimetry, C4	-	-	-	-	-	0.340	0.340	-	1
All	**0.320**	**0.320**	**0.018**	**5.7**	**0.003**	**0.290**	**0.360**	**-**	**33**

Specimen S001 | Complement C4, g/l| histogram summaries in LabScala



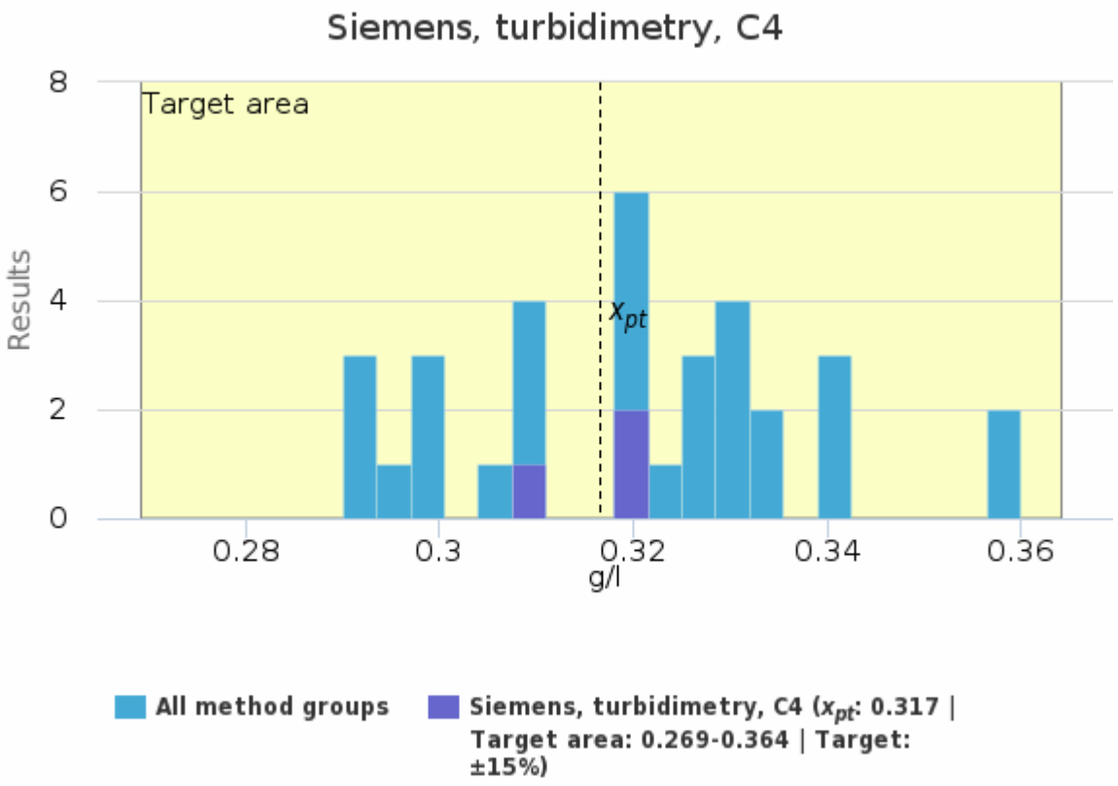


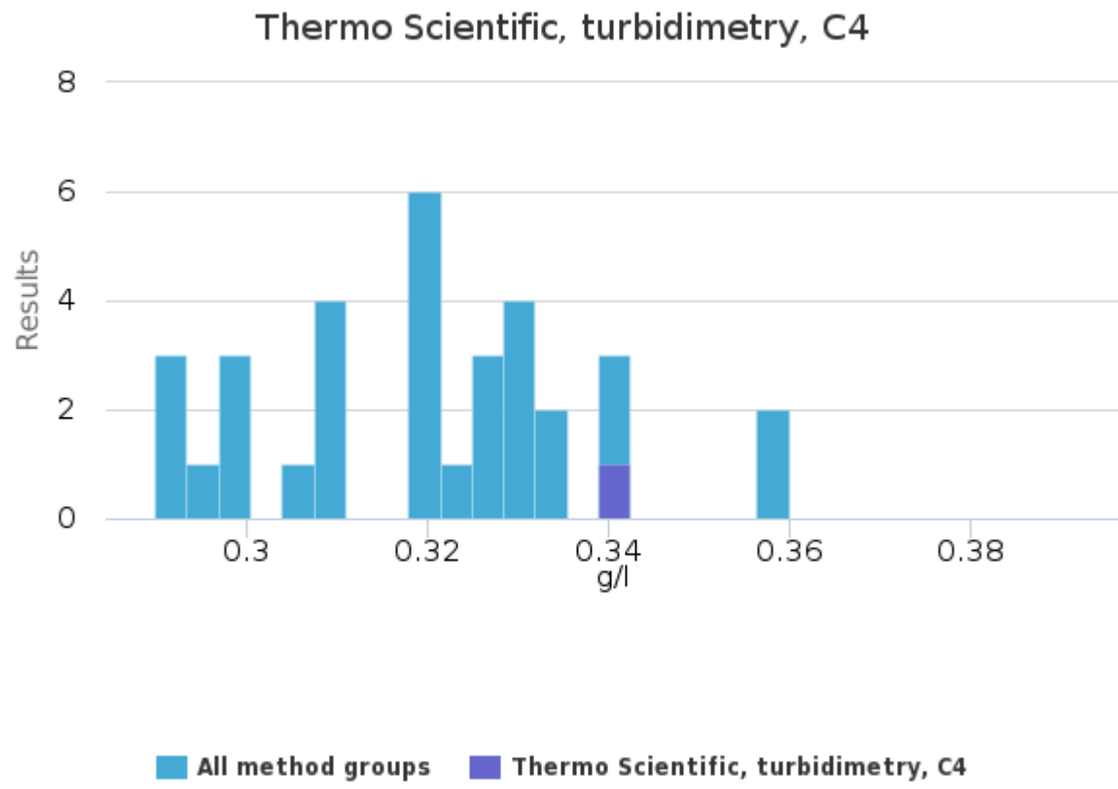




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

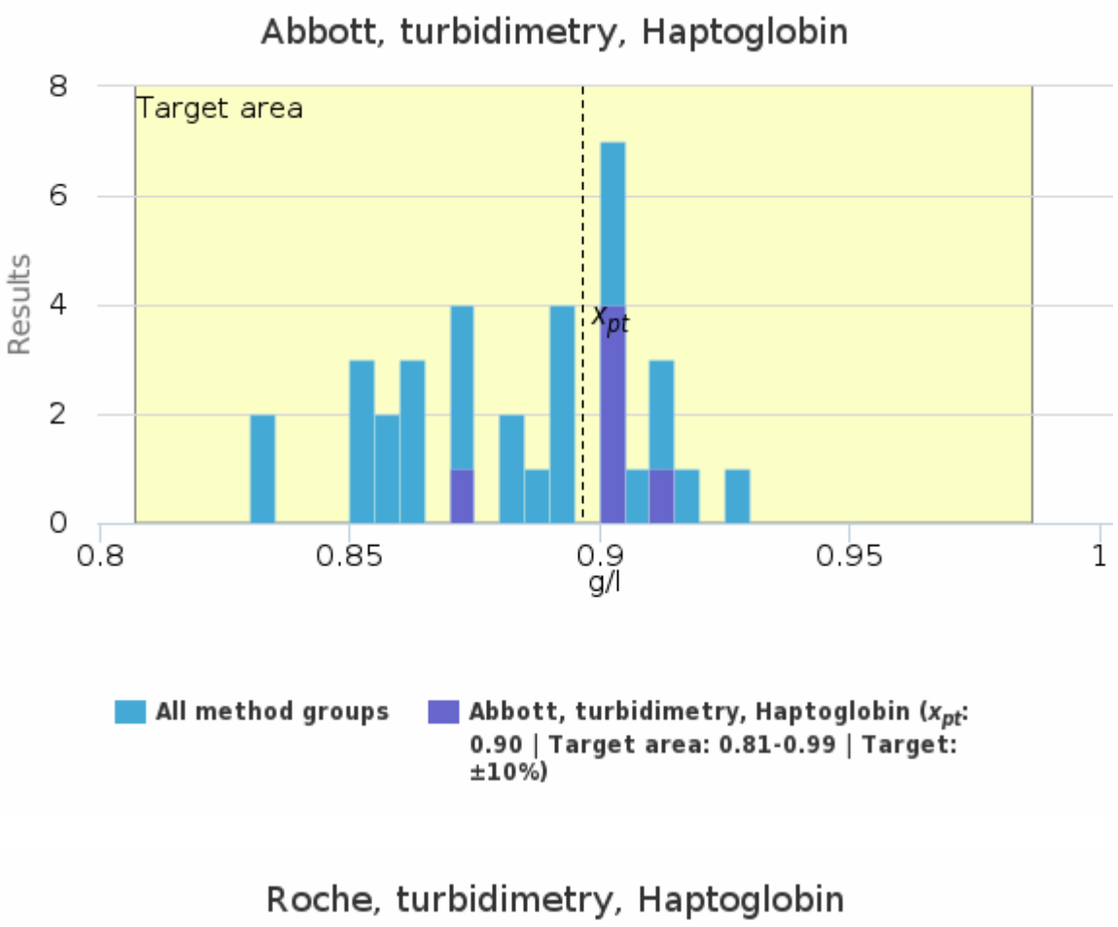


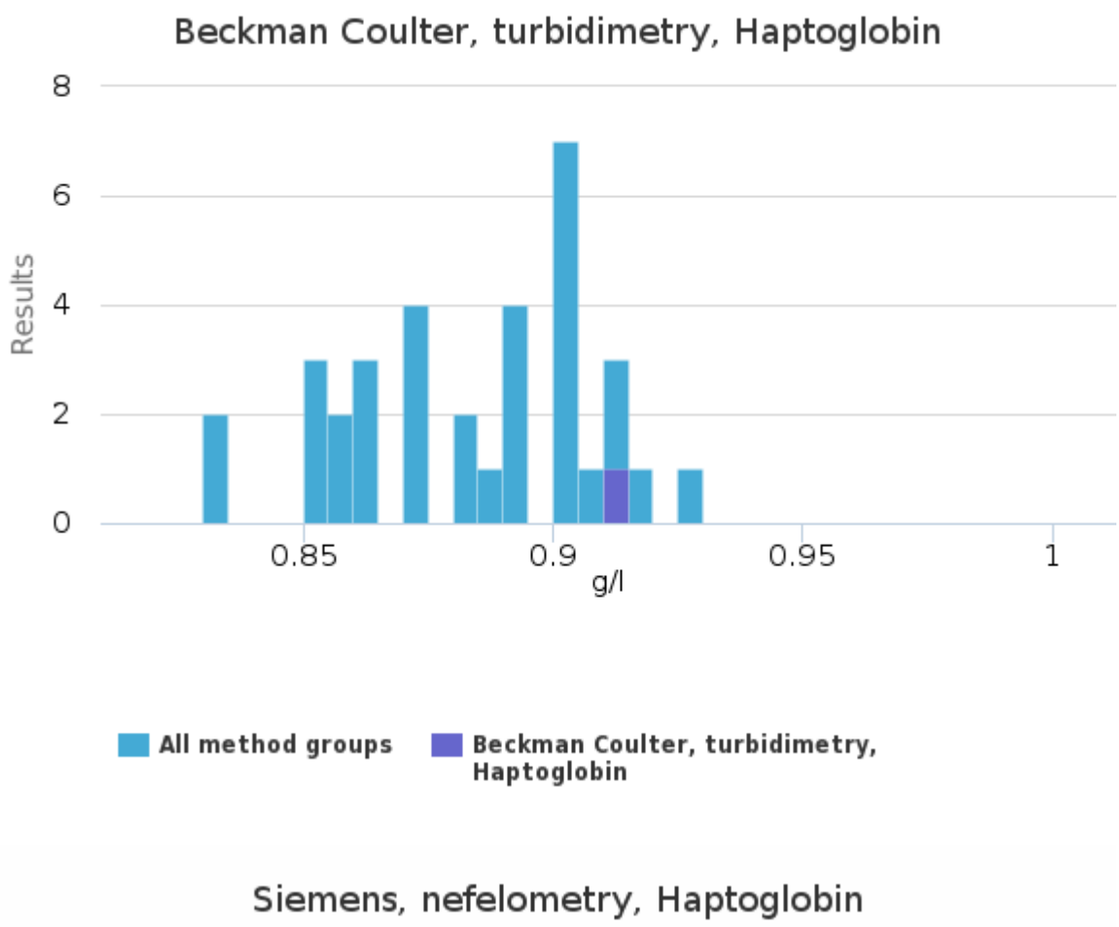


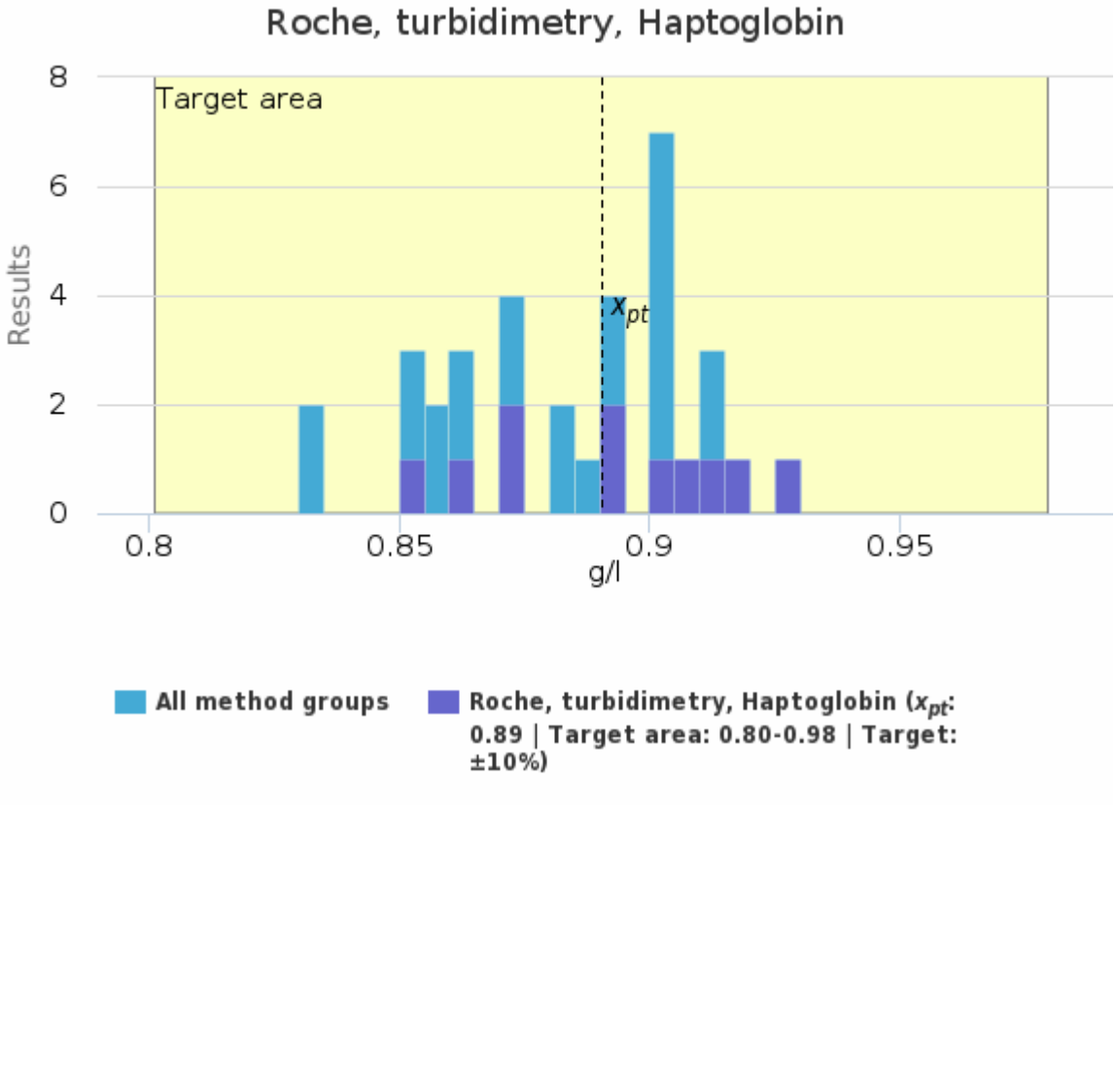
Specimen S001 | Haptoglobin, g/l

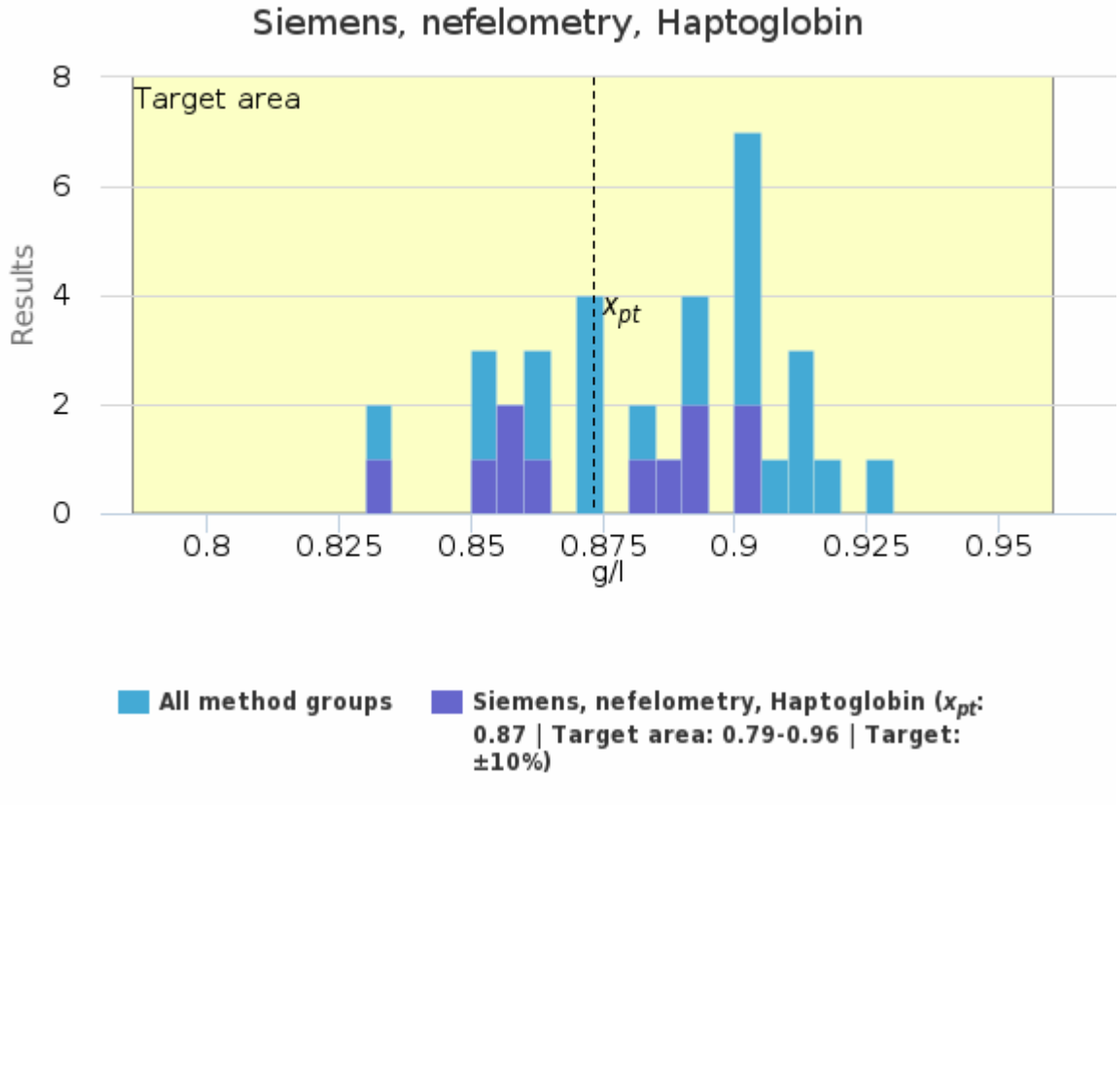
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Haptoglobin	0.90	0.90	0.01	1.5	<0.01	0.87	0.91	-	6
Beckman Coulter, turbidimetry, Haptoglobin	-	-	-	-	-	0.91	0.91	-	1
Roche, turbidimetry, Haptoglobin	0.89	0.89	0.03	2.9	<0.01	0.85	0.93	-	11
Siemens, nefelometry, Haptoglobin	0.87	0.88	0.02	2.7	<0.01	0.83	0.90	-	11
Siemens, turbidimetry, Haptoglobin	0.86	0.86	0.02	2.3	<0.01	0.83	0.88	-	5
All	**0.88**	**0.89**	**0.03**	**2.9**	**<0.01**	**0.83**	**0.93**	**-**	**34**

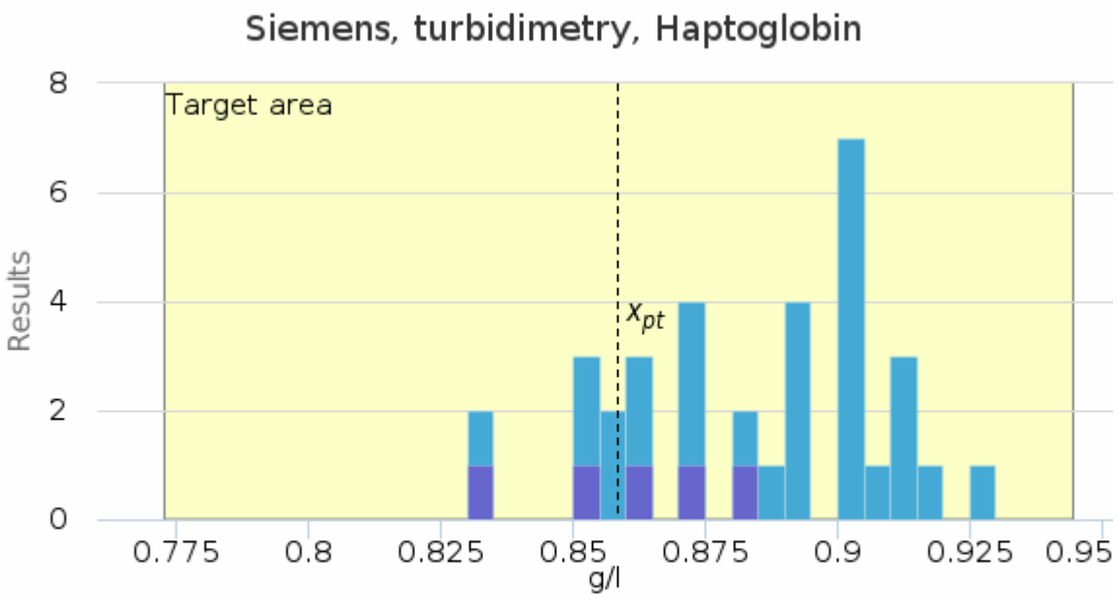
Specimen S001 | Haptoglobin, g/l| histogram summaries in LabScala







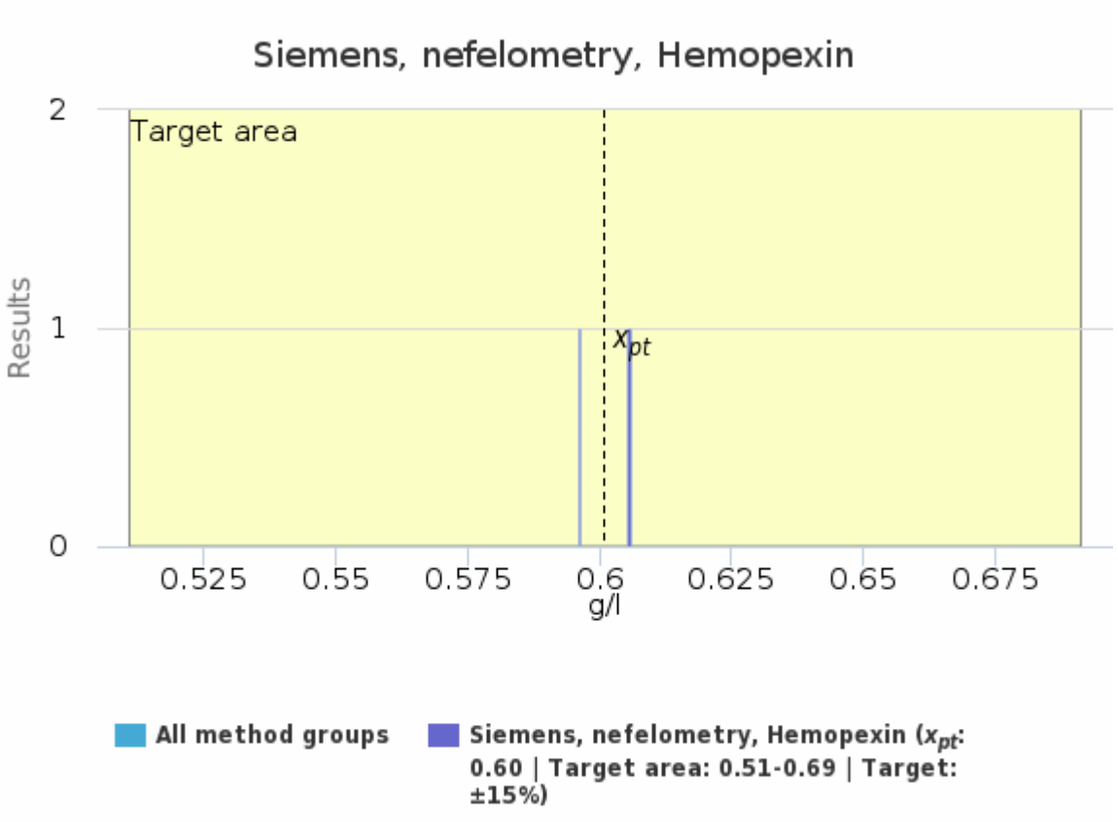




Specimen S001 | Hemopexin, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Siemens, nefelometry, Hemopexin	0.60	0.60	<0.01	1.2	<0.01	0.60	0.61	-	2
All	**0.60**	**0.60**	**<0.01**	**1.2**	**<0.01**	**0.60**	**0.61**	**-**	**2**

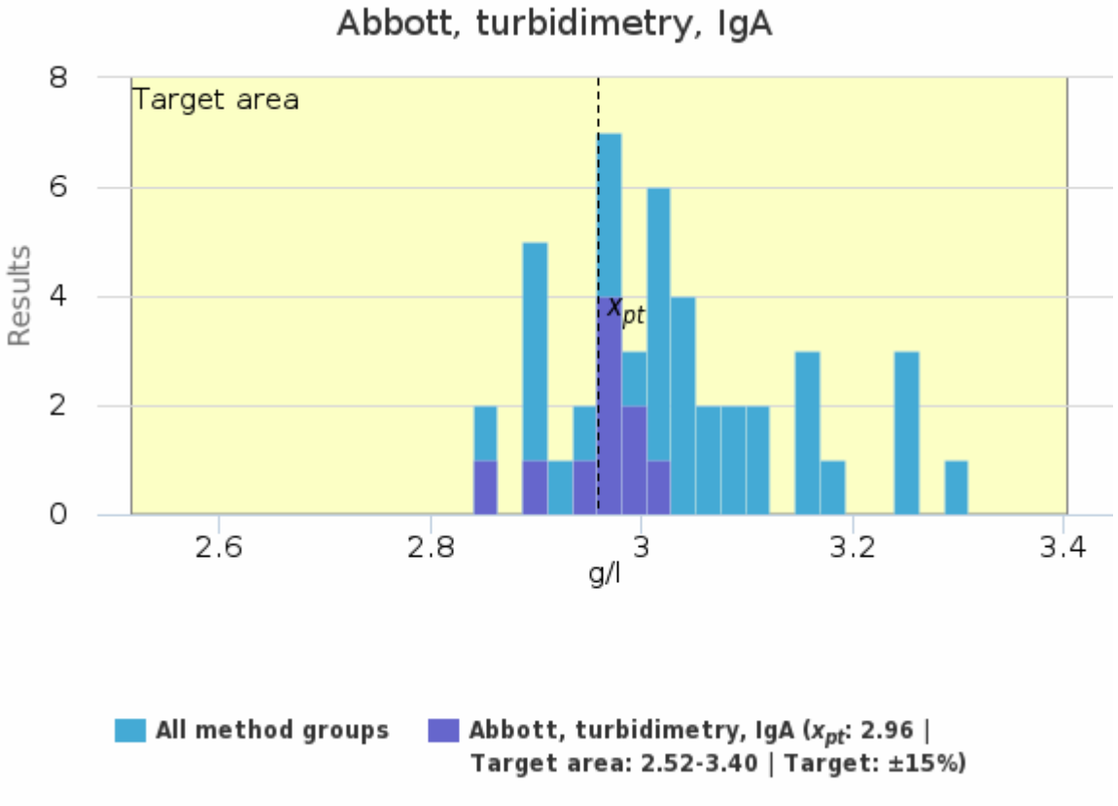
Specimen S001 | Hemopexin, g/l| histogram summaries in LabScala

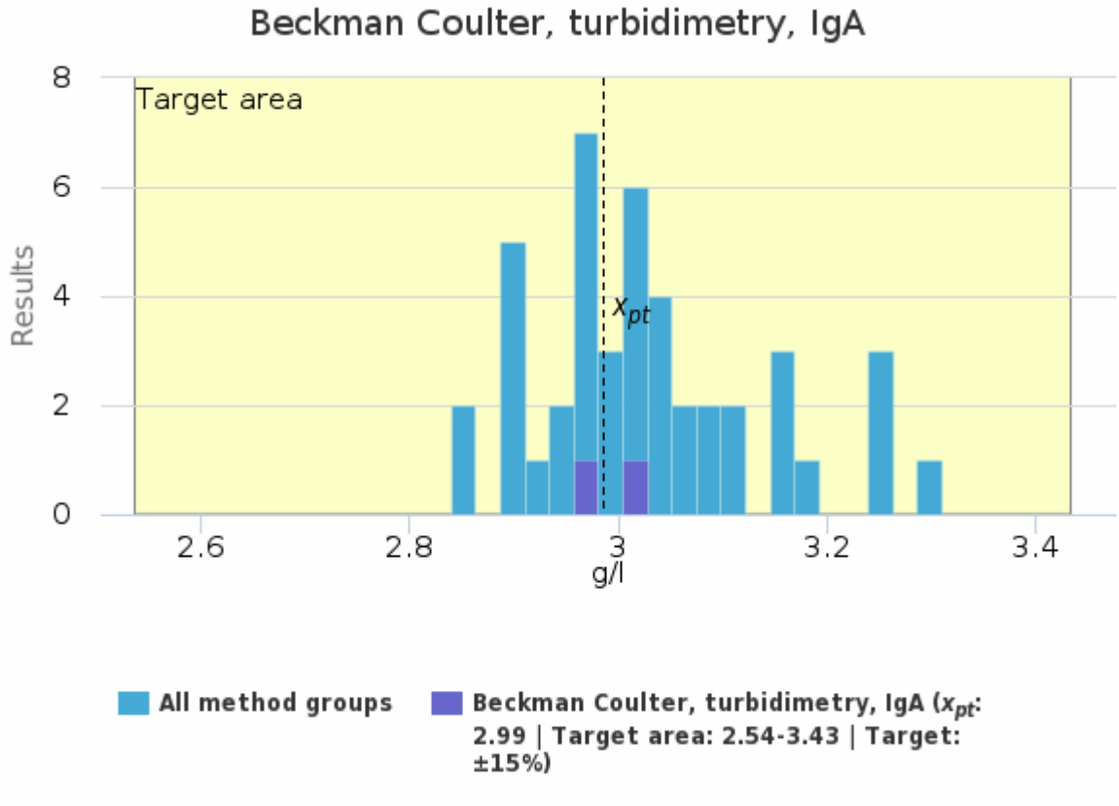


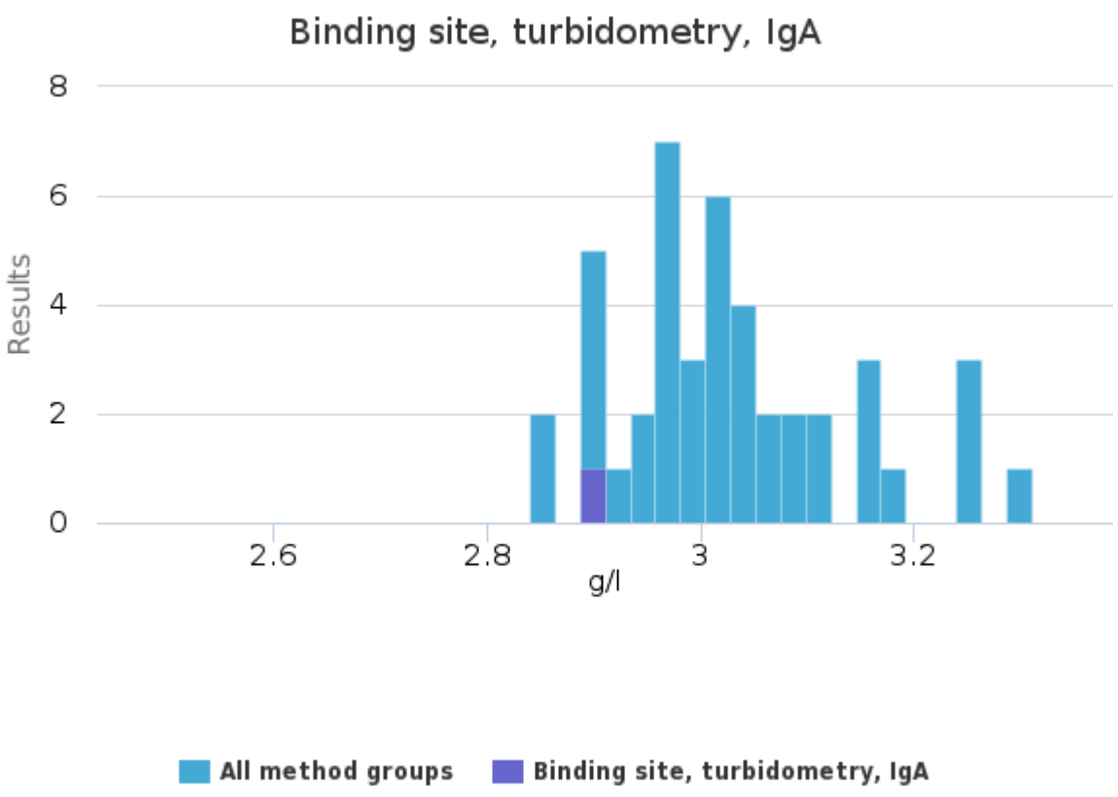
Specimen S001 | IgA, g/l

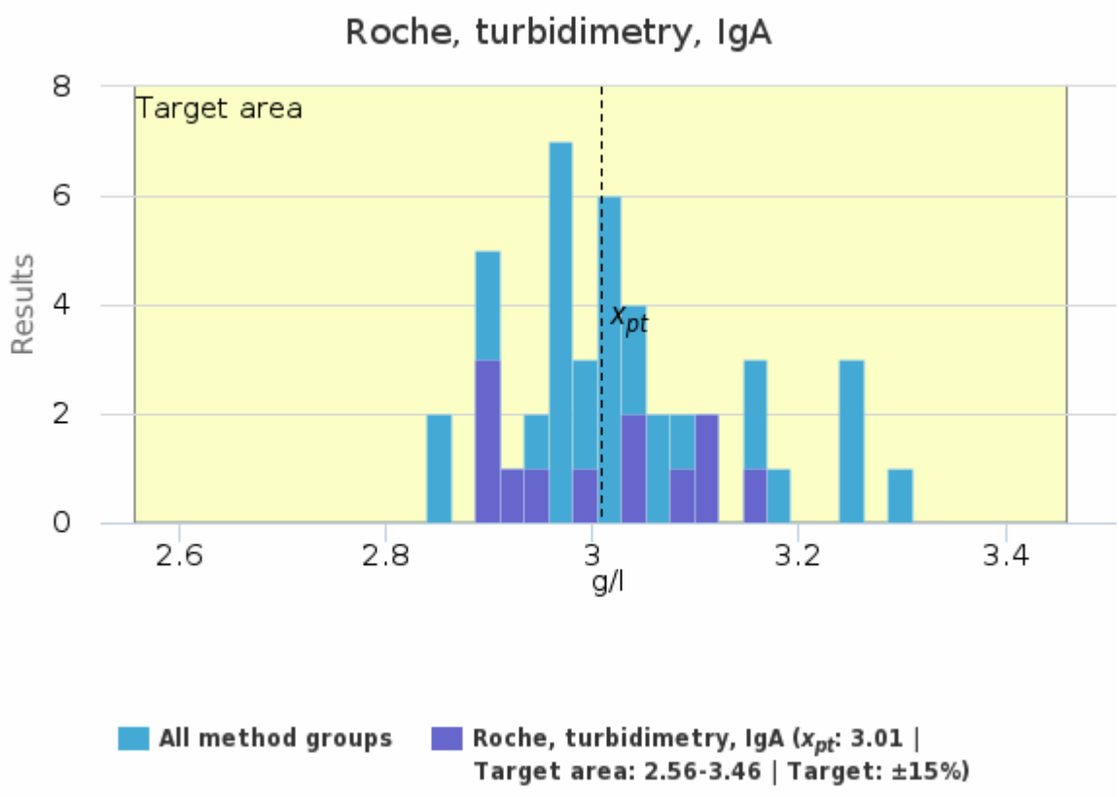
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, IgA	2.96	2.98	0.05	1.8	0.02	2.84	3.02	-	10
Beckman Coulter, turbidimetry, IgA	2.99	2.99	0.04	1.2	0.03	2.96	3.01	-	2
Binding site, turbidometry, IgA	-	-	-	-	-	2.90	2.90	-	1
Roche, turbidimetry, IgA	3.01	3.01	0.09	3.1	0.03	2.89	3.15	-	12
Siemens, nefelometry, IgA	3.10	3.07	0.13	4.3	0.03	2.85	3.31	-	15
Siemens, turbidimetry, IgA	3.05	3.06	0.04	1.3	0.02	3.01	3.09	-	3
Thermo Scientific, turbidimetry, IgA	-	-	-	-	-	3.01	3.01	-	1
All	**3.03**	**3.01**	**0.11**	**3.7**	**0.02**	**2.84**	**3.31**	**-**	**44**

Specimen S001 | IgA, g/l| histogram summaries in LabScala



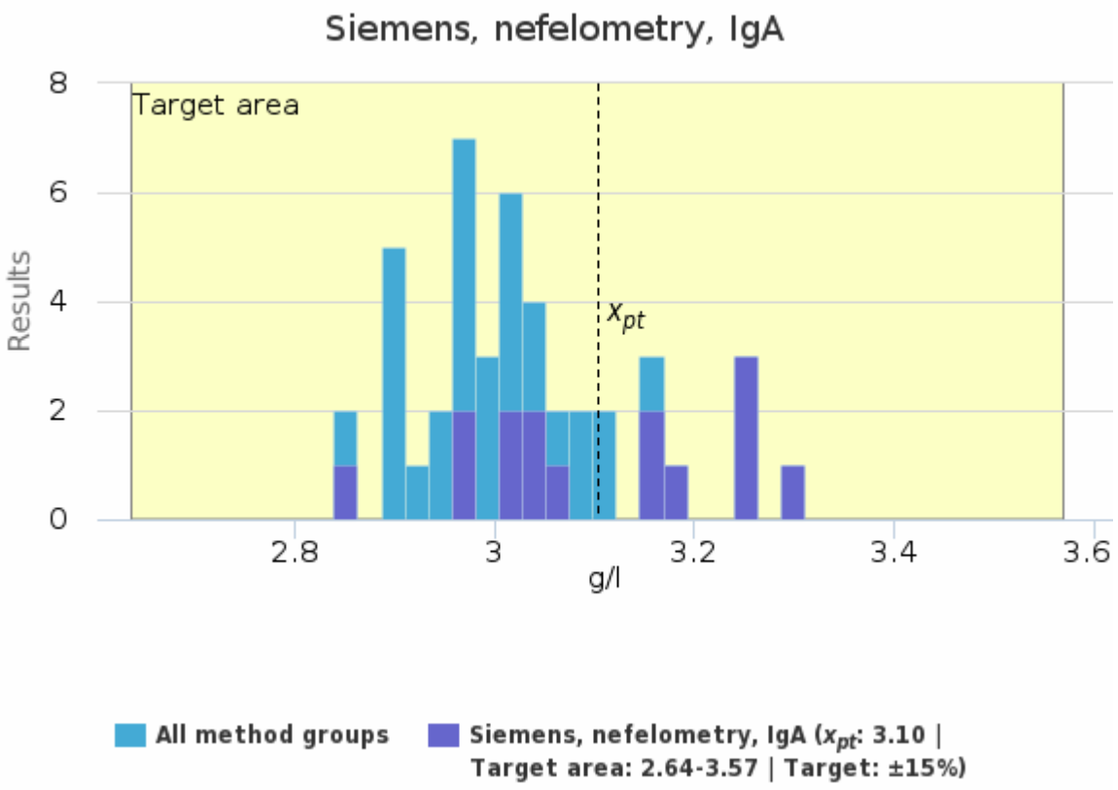


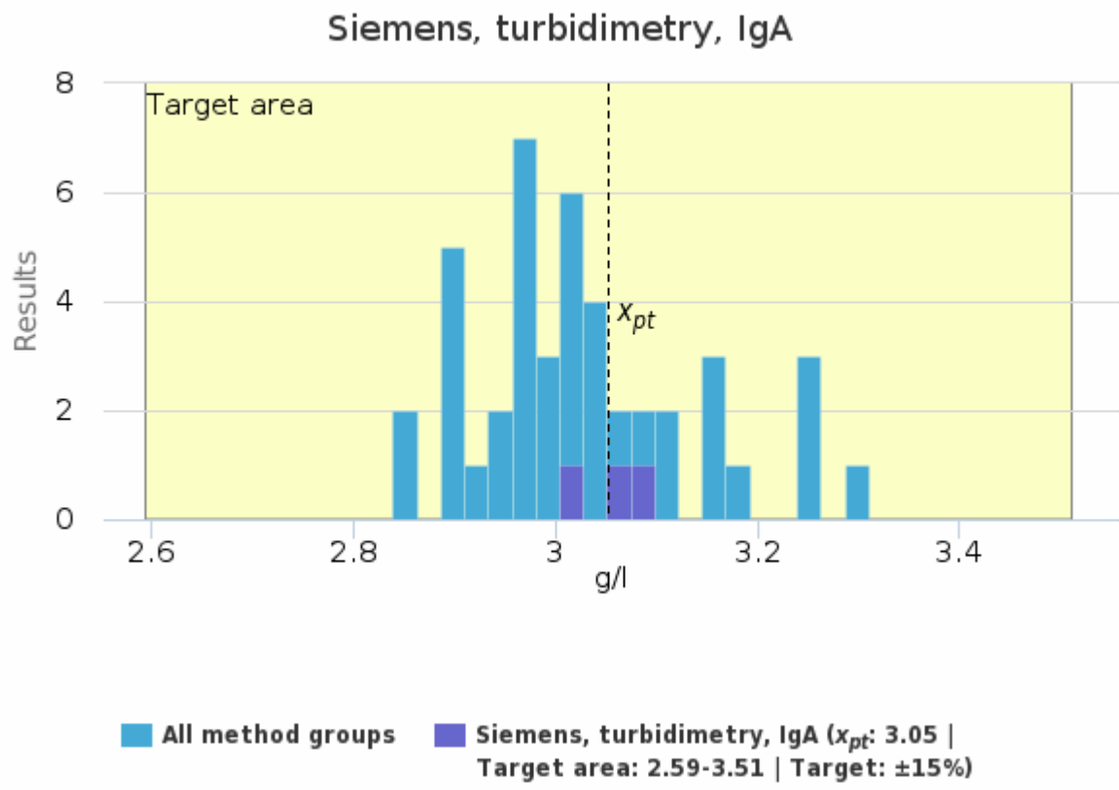


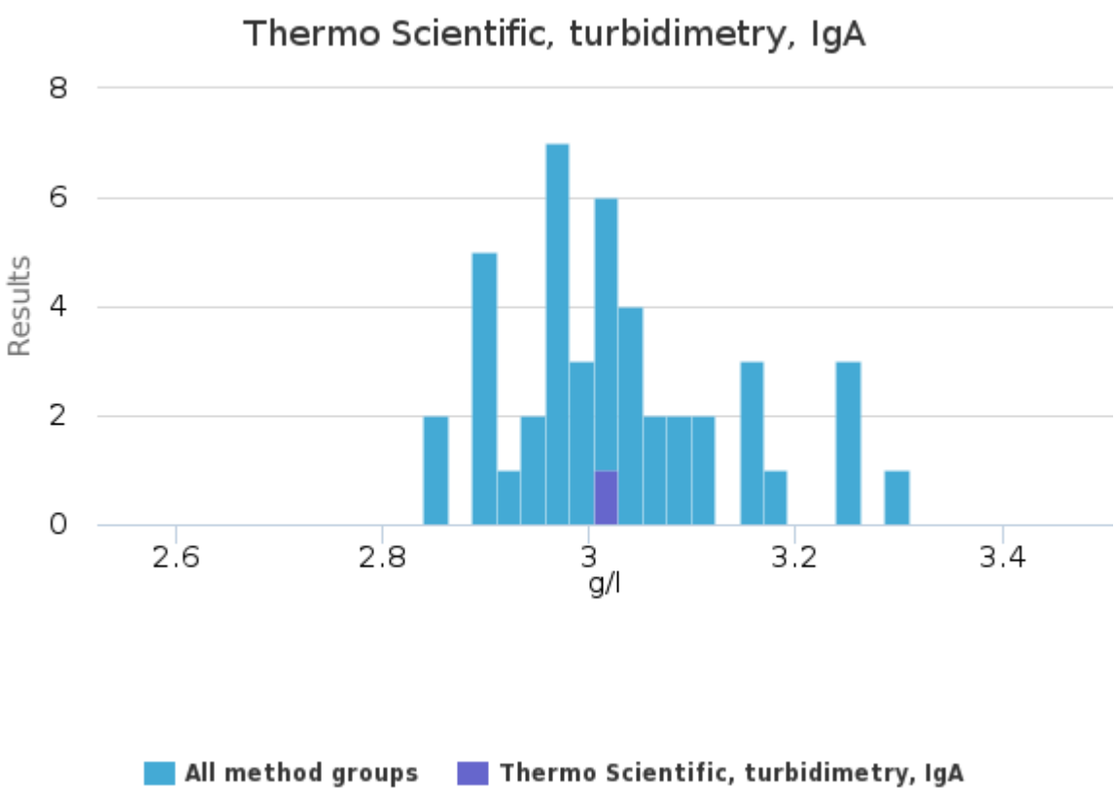


Proteins, immunochemical determinations, January, 1-2023

Quantitative report



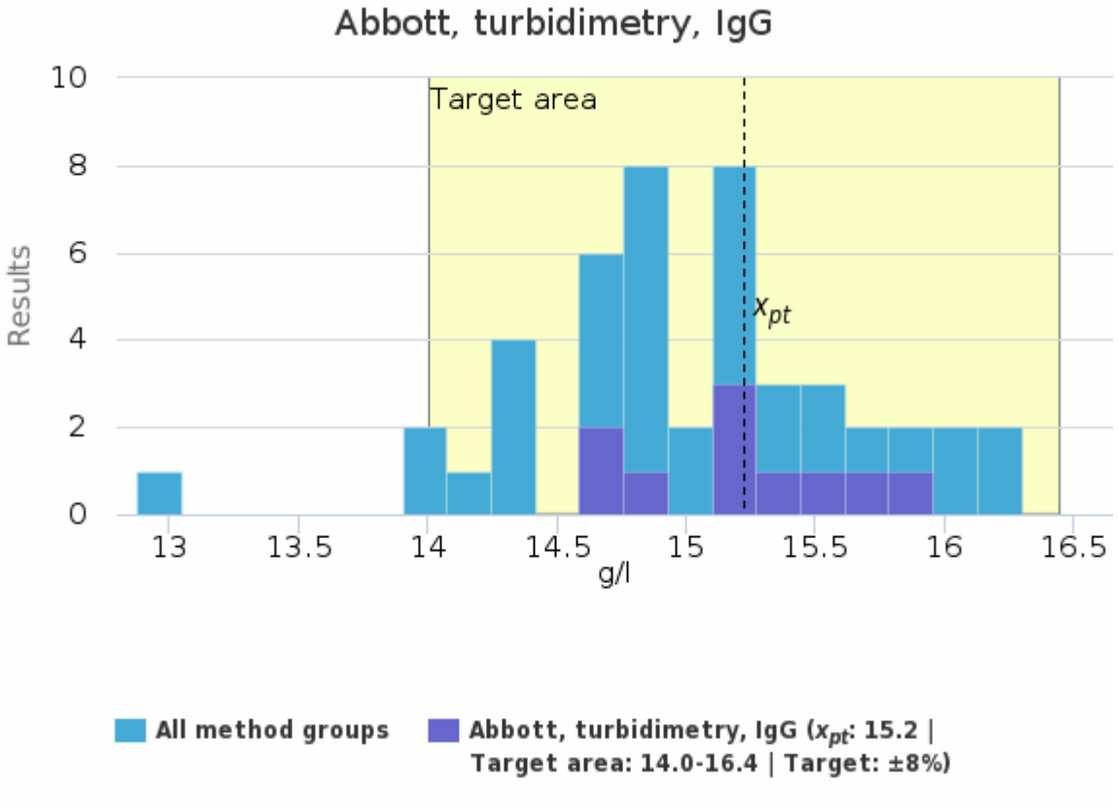


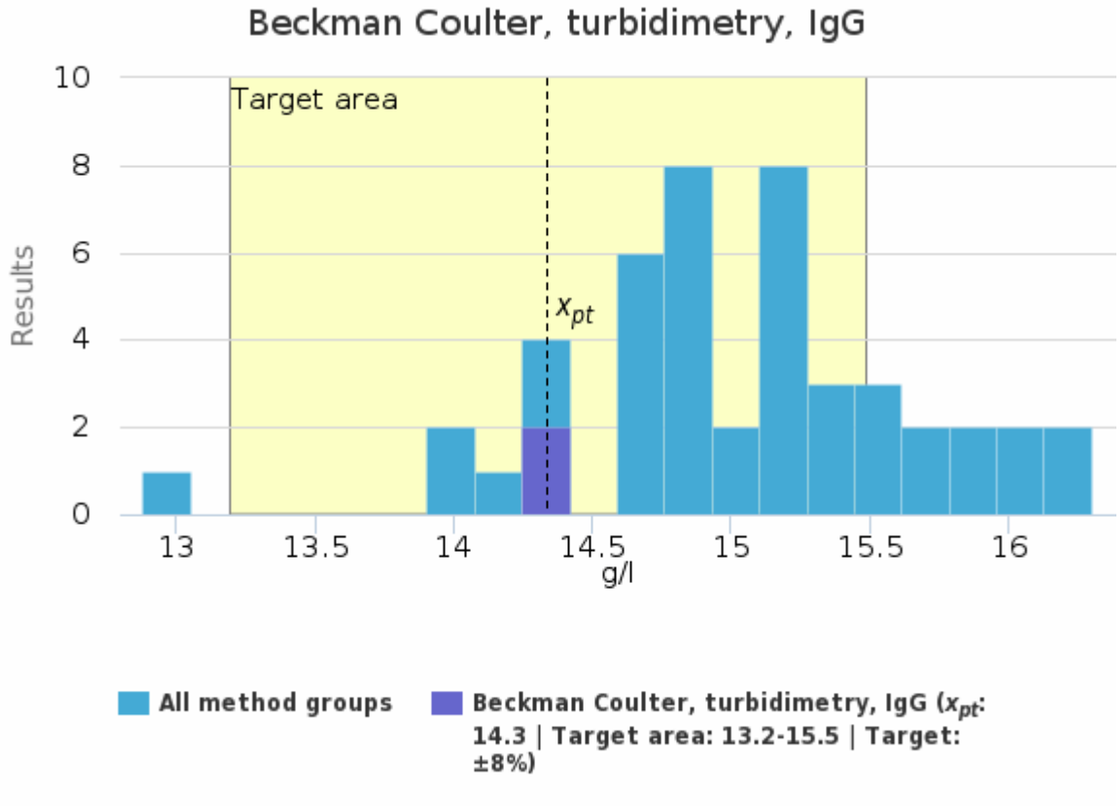


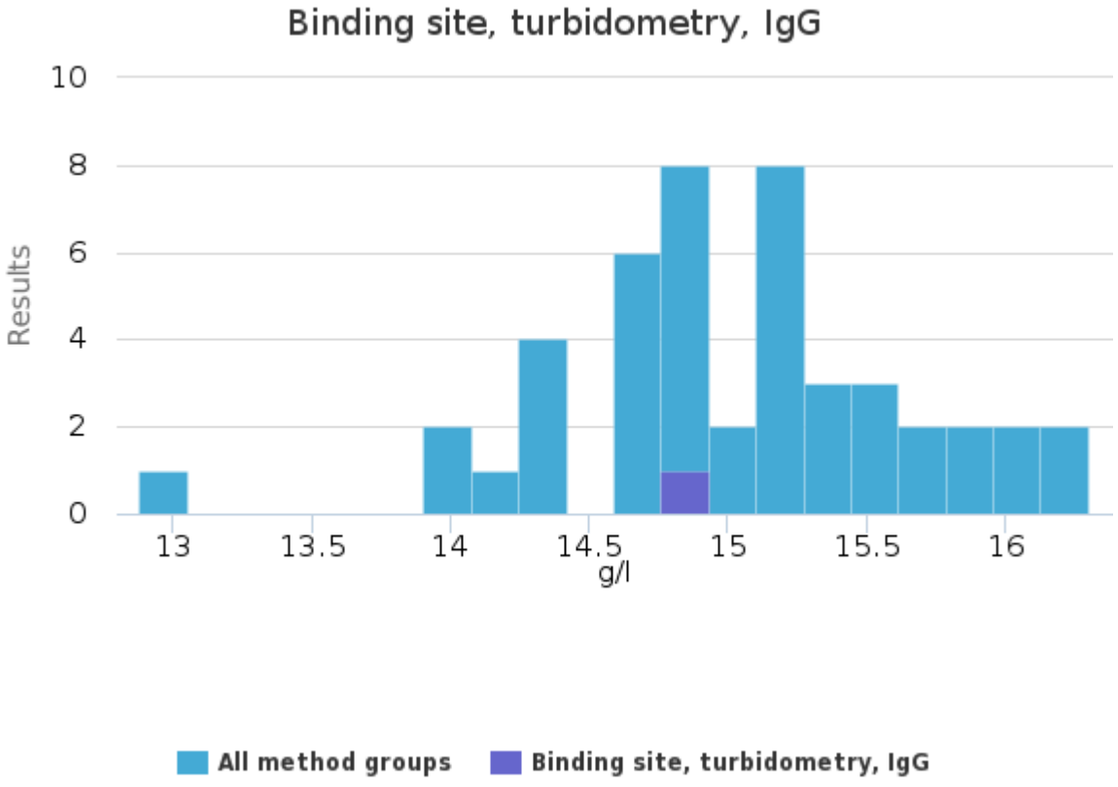
Specimen S001 | IgG, g/l

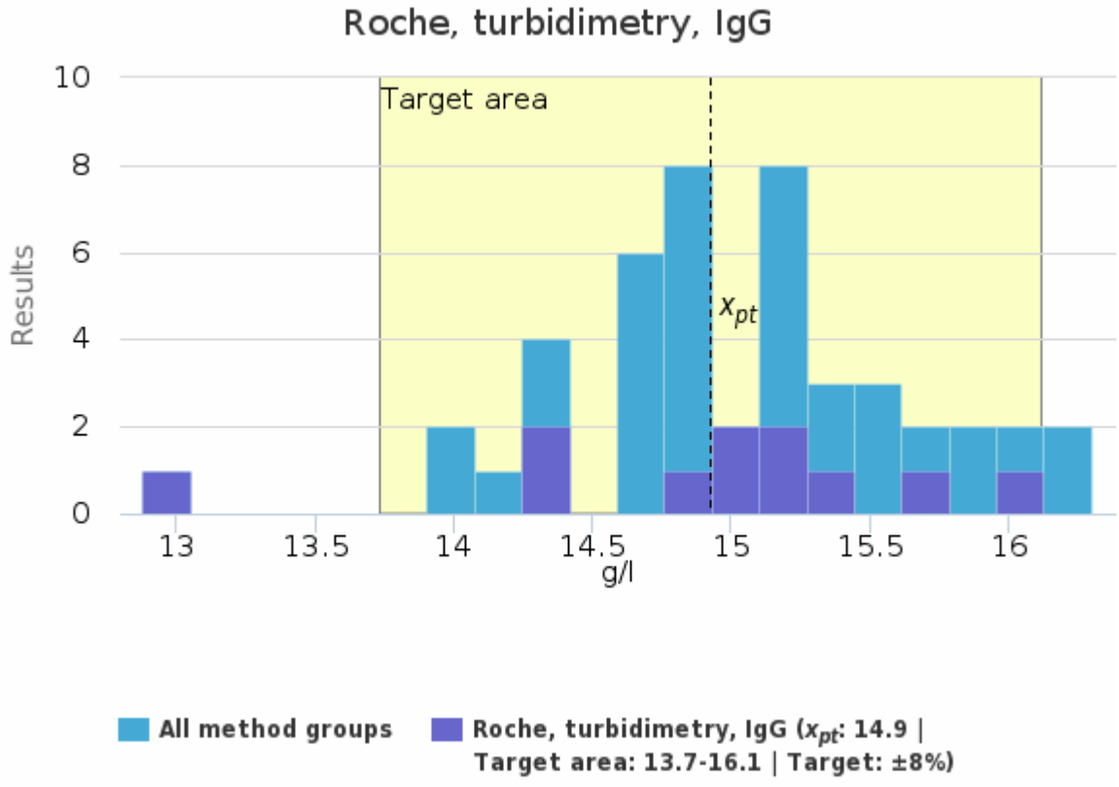
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, IgG	15.2	15.3	0.4	2.6	0.1	14.6	15.8	-	10
Beckman Coulter, turbidimetry, IgG	14.3	14.3	<0.1	0.6	<0.1	14.3	14.4	-	2
Binding site, turbidometry, IgG	-	-	-	-	-	14.9	14.9	-	1
Roche, turbidimetry, IgG	14.9	15.1	0.8	5.6	0.3	12.9	16.0	-	11
Siemens, nefelometry, IgG	15.1	14.9	0.7	4.5	0.2	14.0	16.3	-	18
Siemens, turbidimetry, IgG	15.4	15.4	0.2	1.4	0.1	15.2	15.6	-	3
Thermo Scientific, turbidimetry, IgG	-	-	-	-	-	14.0	14.0	-	1
All	**15.1**	**15.1**	**0.6**	**3.8**	**<0.1**	**14.0**	**16.3**	**1**	**46**

Specimen S001 | IgG, g/l| histogram summaries in LabScala



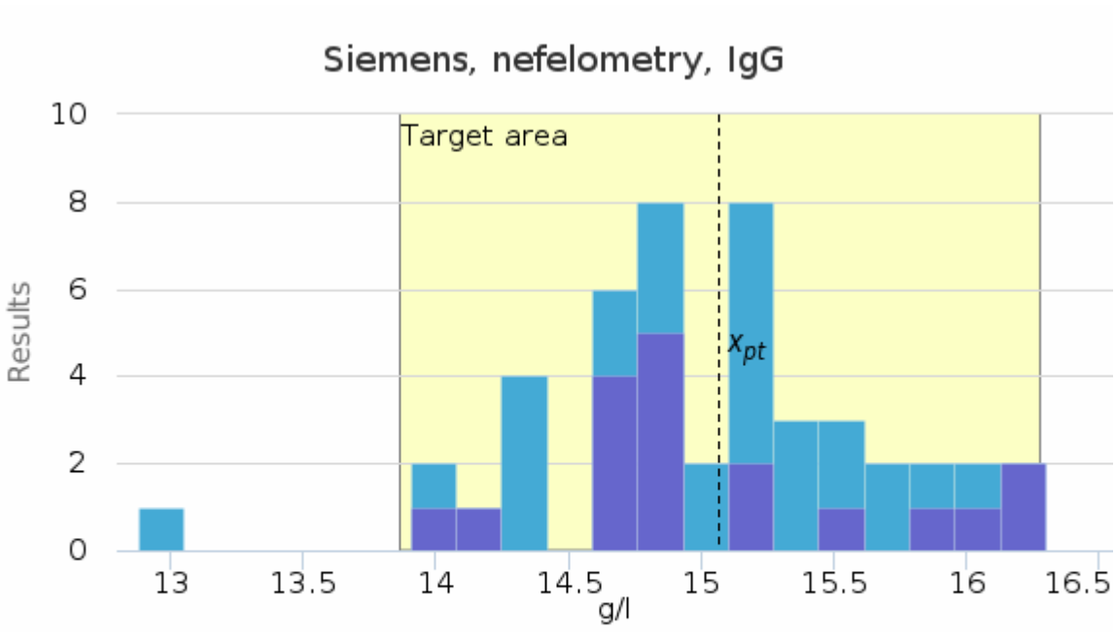


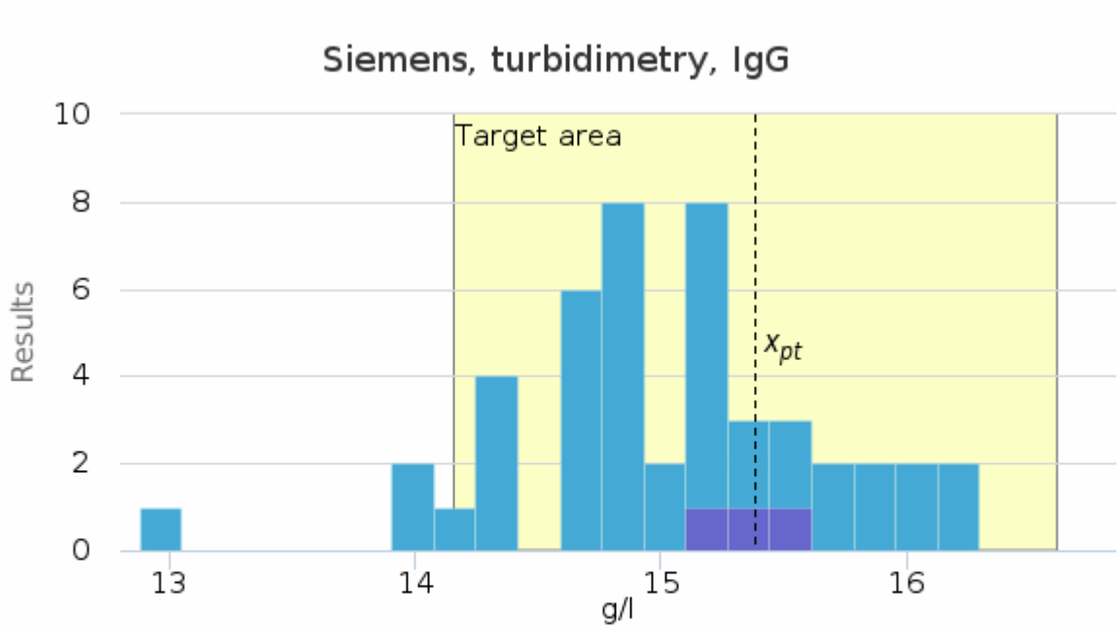


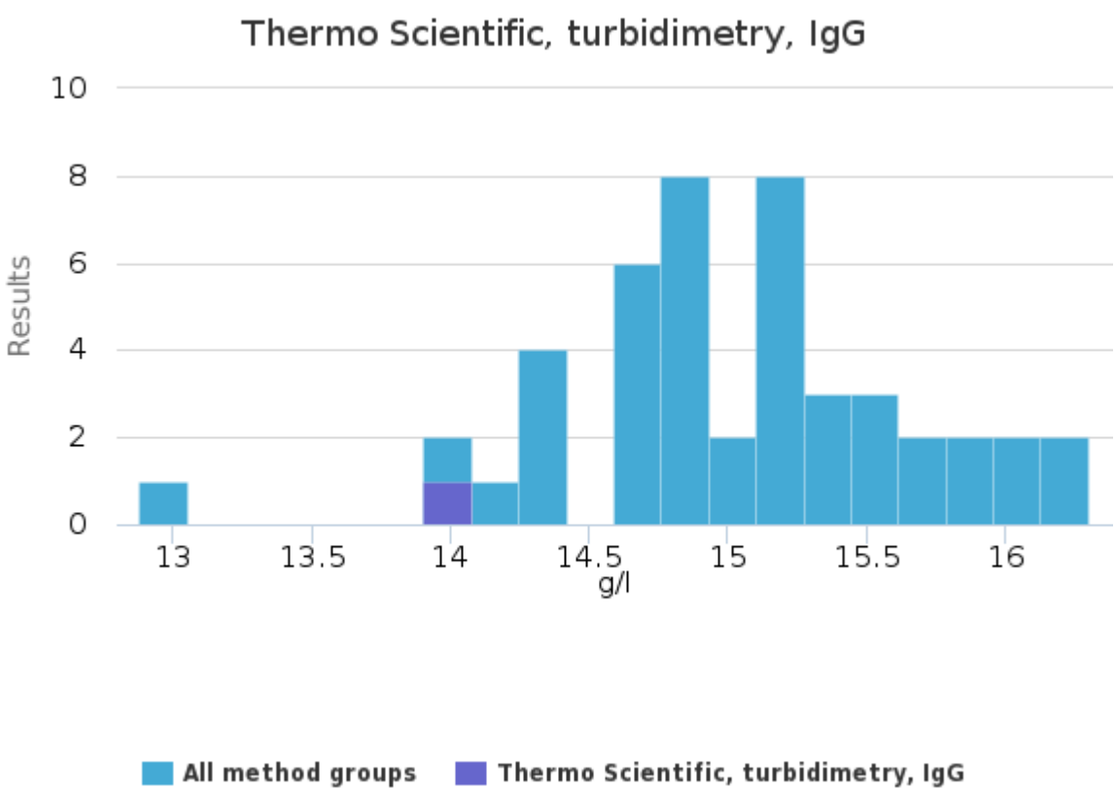


Proteins, immunochemical determinations, January, 1-2023

Quantitative report



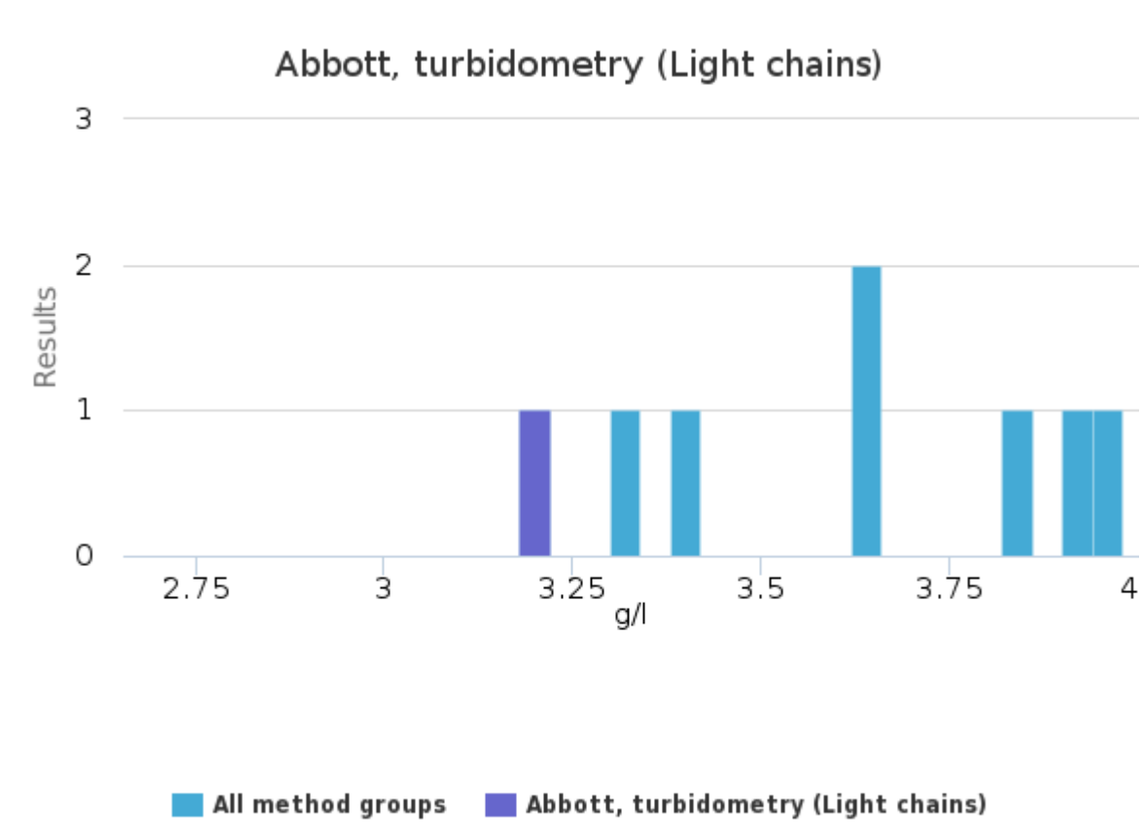


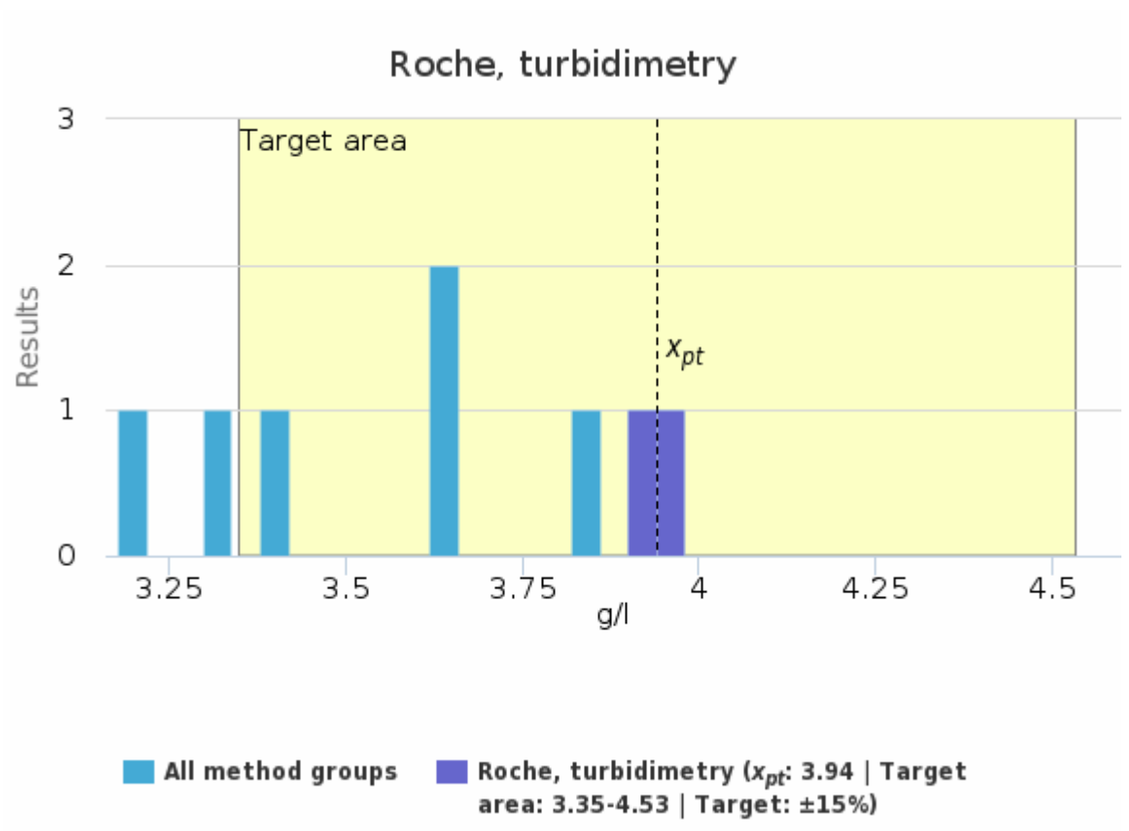


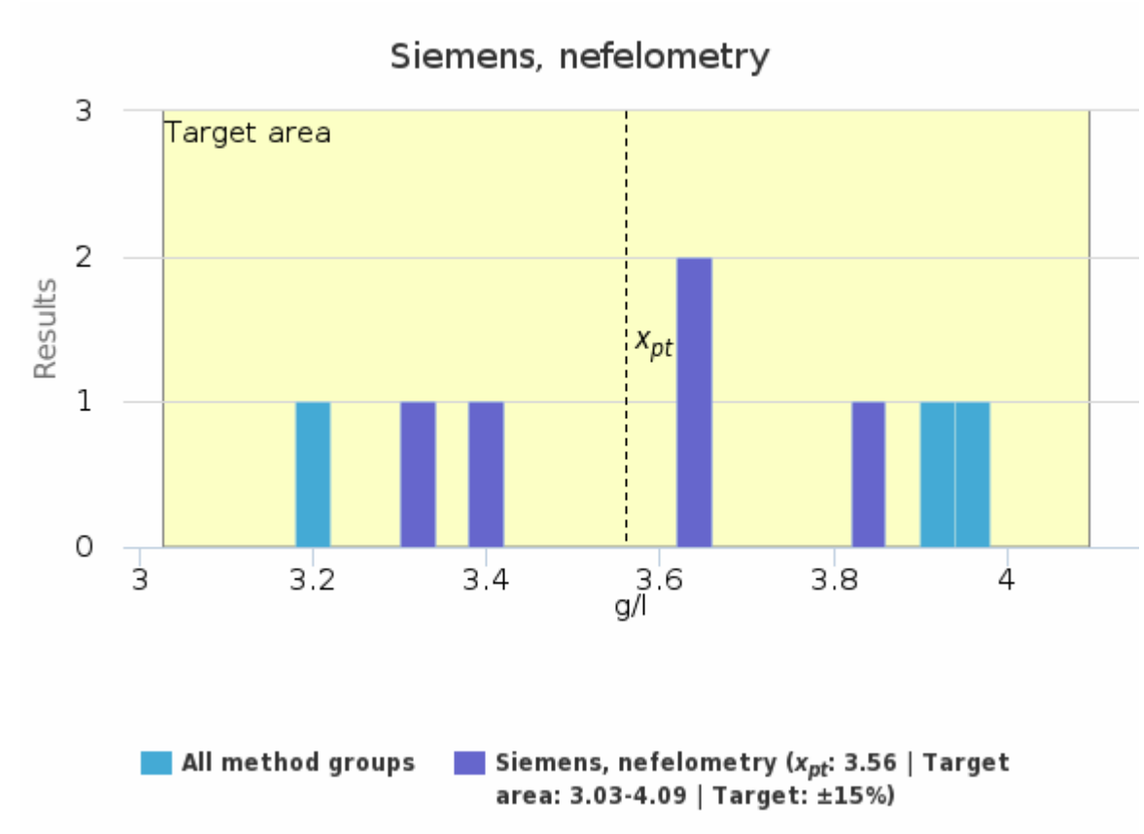
Specimen S001 | IgLCKappa, total, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidometry (Light chains)	-	-	-	-	-	3.18	3.18	-	1
Roche, turbidimetry	3.94	3.94	0.05	1.4	0.04	3.90	3.98	-	2
Siemens, nefelometry	3.56	3.62	0.20	5.7	0.09	3.33	3.83	-	5
All	**3.61**	**3.63**	**0.29**	**8.0**	**0.10**	**3.18**	**3.98**	**-**	**8**

Specimen S001 | IgLCKappa, total, g/l| histogram summaries in LabScala





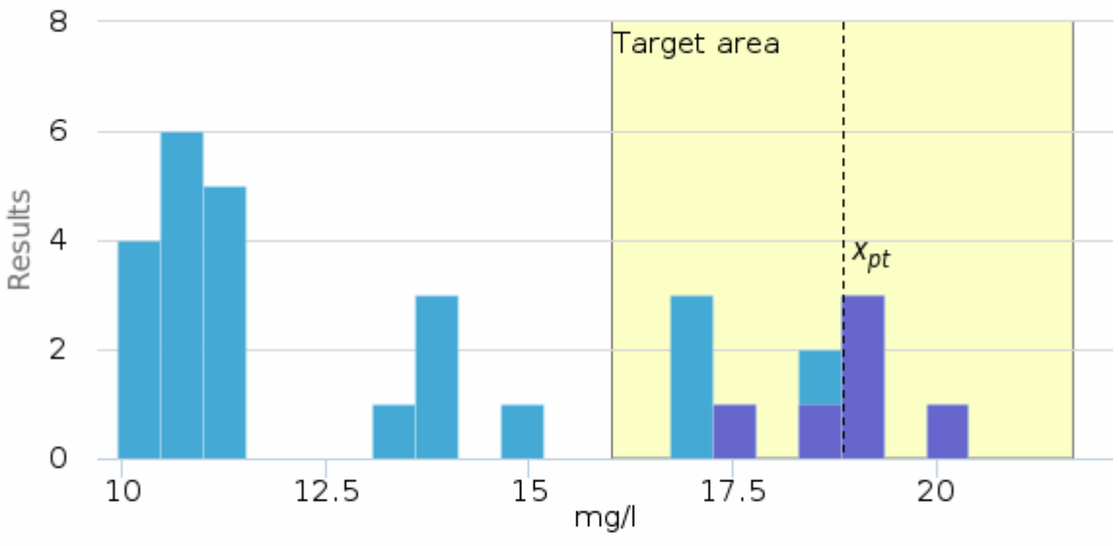


Specimen S001 | IgLCKappa, free, mg/l

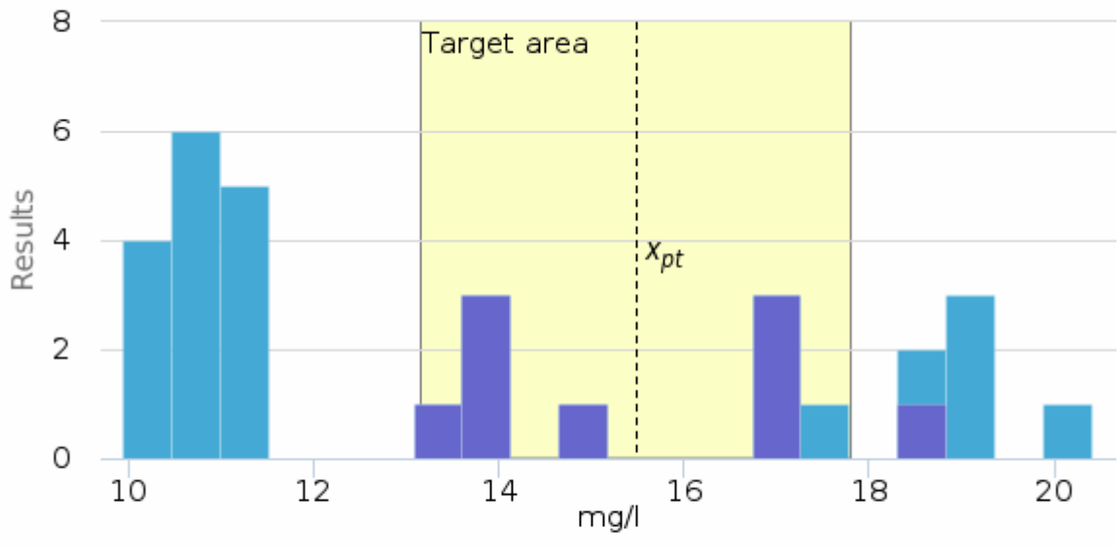
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Freelite, nefelometry	18.85	18.90	0.96	5.1	0.39	17.40	20.40	-	6
Freelite, turbidimetry	15.49	14.80	1.88	12.2	0.63	13.50	18.67	-	9
Siemens, nefelometry	10.55	10.55	0.37	3.5	0.11	9.95	11.10	-	12
Siemens turbidimetry	11.14	11.10	0.10	0.9	0.06	11.07	11.26	-	3
All	**13.75**	**12.38**	**3.53**	**25.7**	**0.64**	**9.95**	**20.40**	**-**	**30**

Specimen S001 | IgLCKappa, free, mg/l| histogram summaries in LabScala

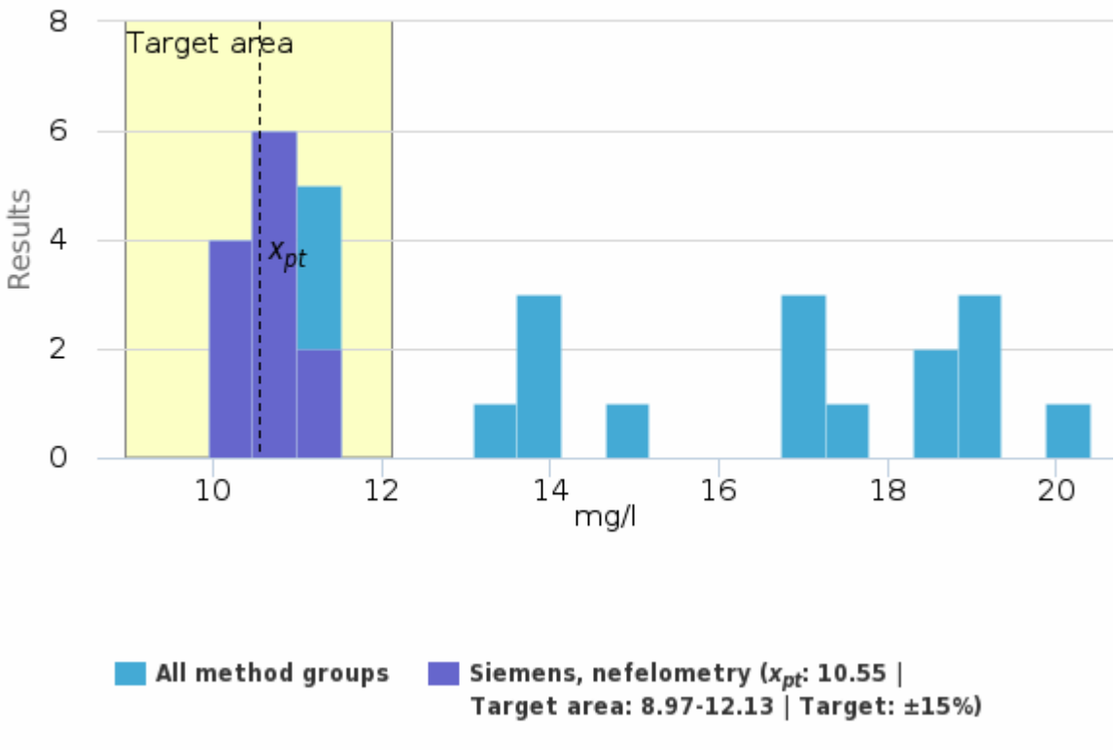
Freelite, nefelometry



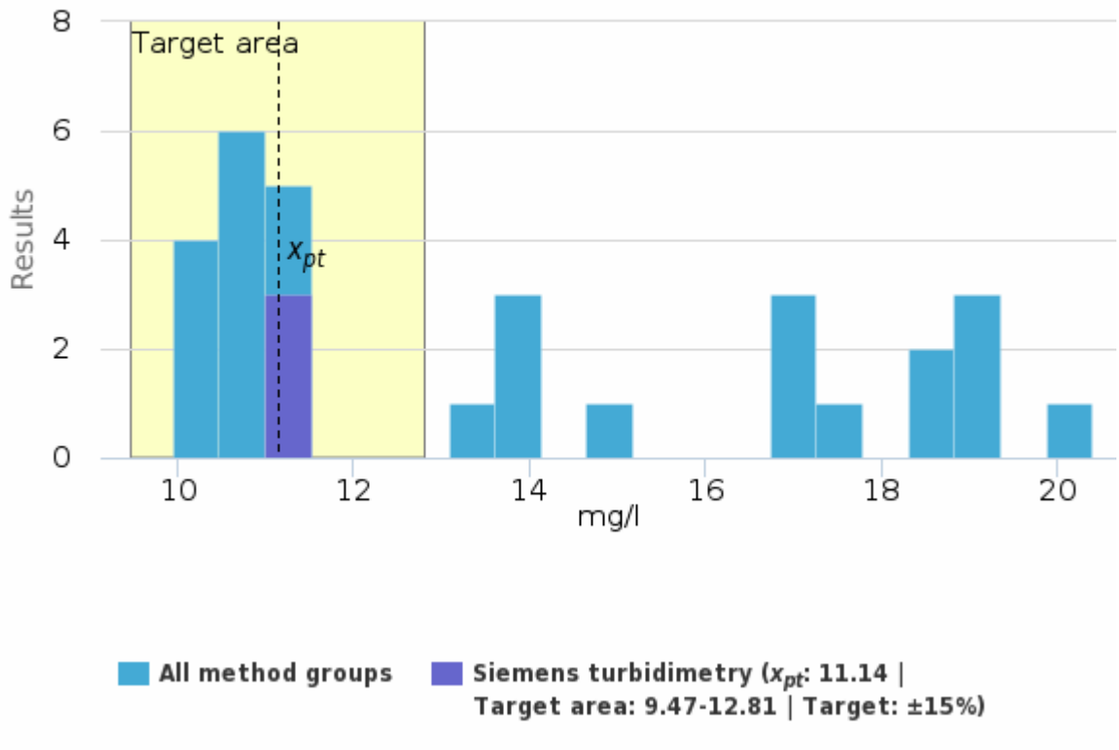
Freelite, turbidimetry



Siemens, nefelometry



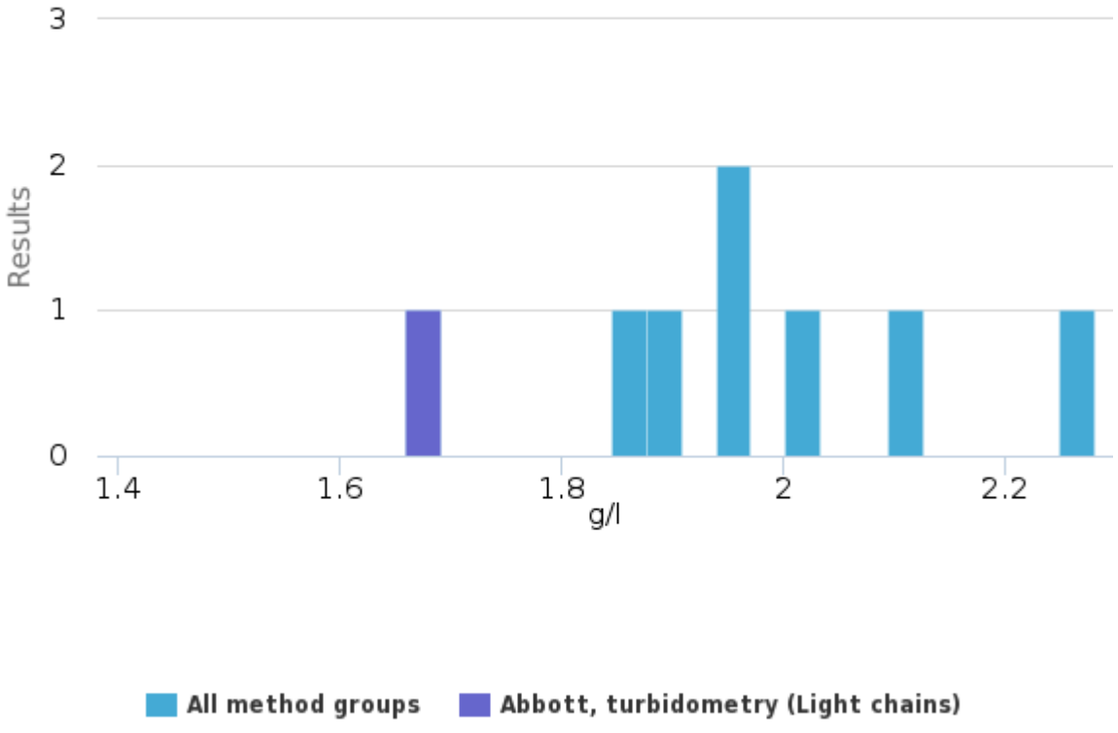
Siemens turbidimetry

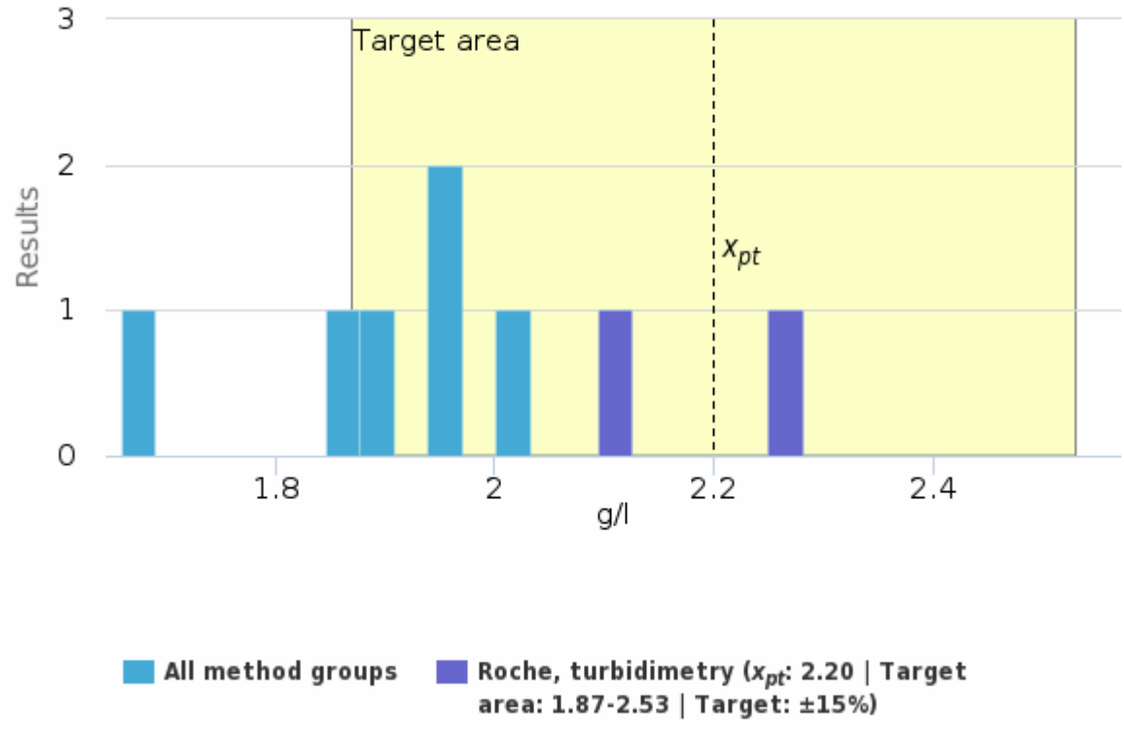


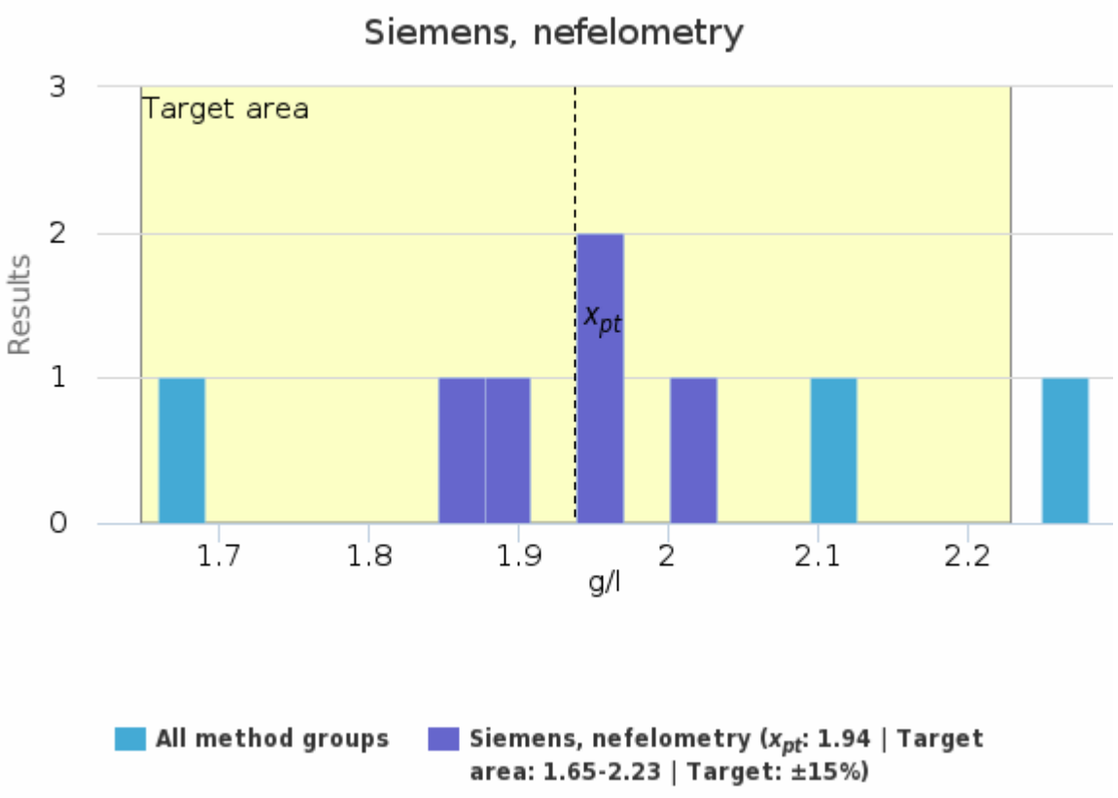
Specimen S001 | IgLCLambda, total, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidometry (Light chains)	-	-	-	-	-	1.66	1.66	-	1
Roche, turbidimetry	2.20	2.20	0.11	5.2	0.08	2.12	2.28	-	2
Siemens, nefelometry	1.94	1.94	0.07	3.5	0.03	1.85	2.03	-	5
All	**1.97**	**1.96**	**0.18**	**9.4**	**0.07**	**1.66**	**2.28**	**-**	**8**

Specimen S001 | IgLCLambda, total, g/l| histogram summaries in LabScala



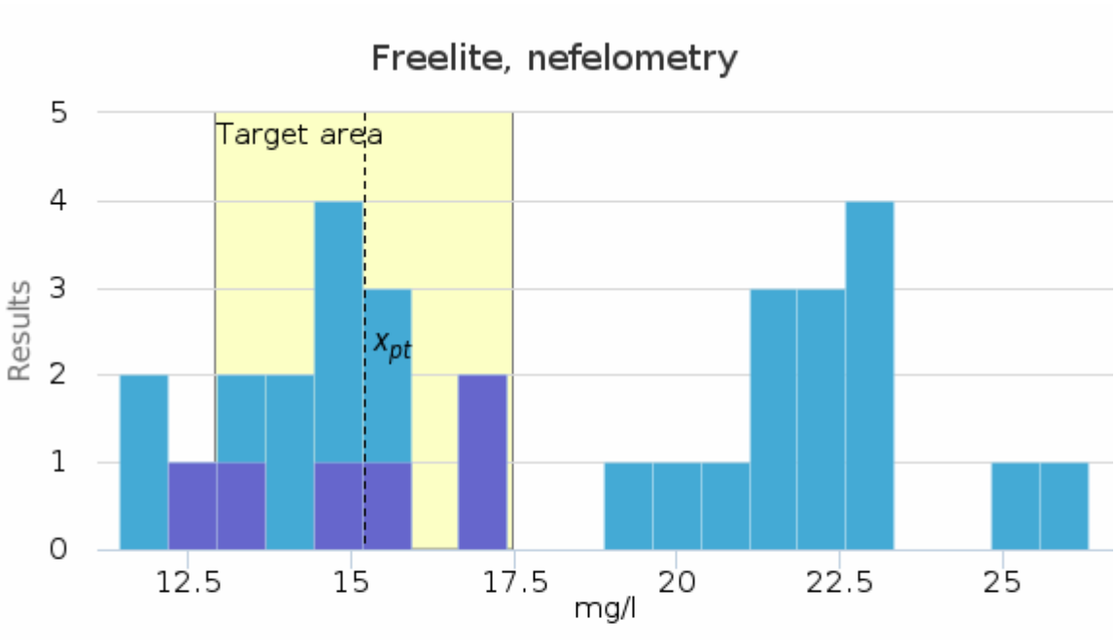


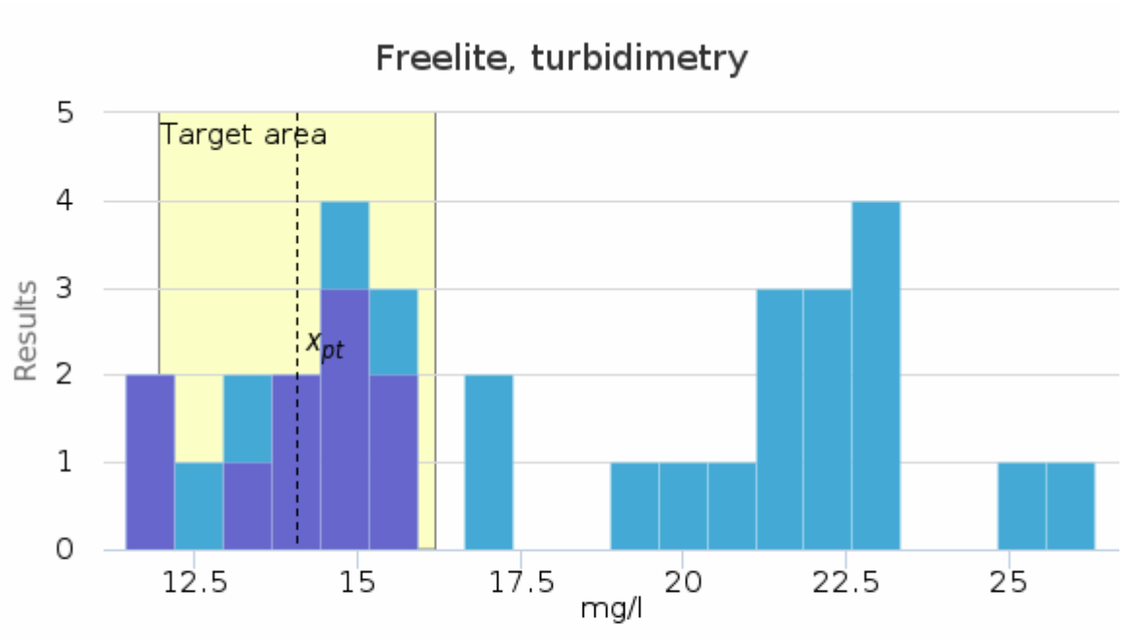


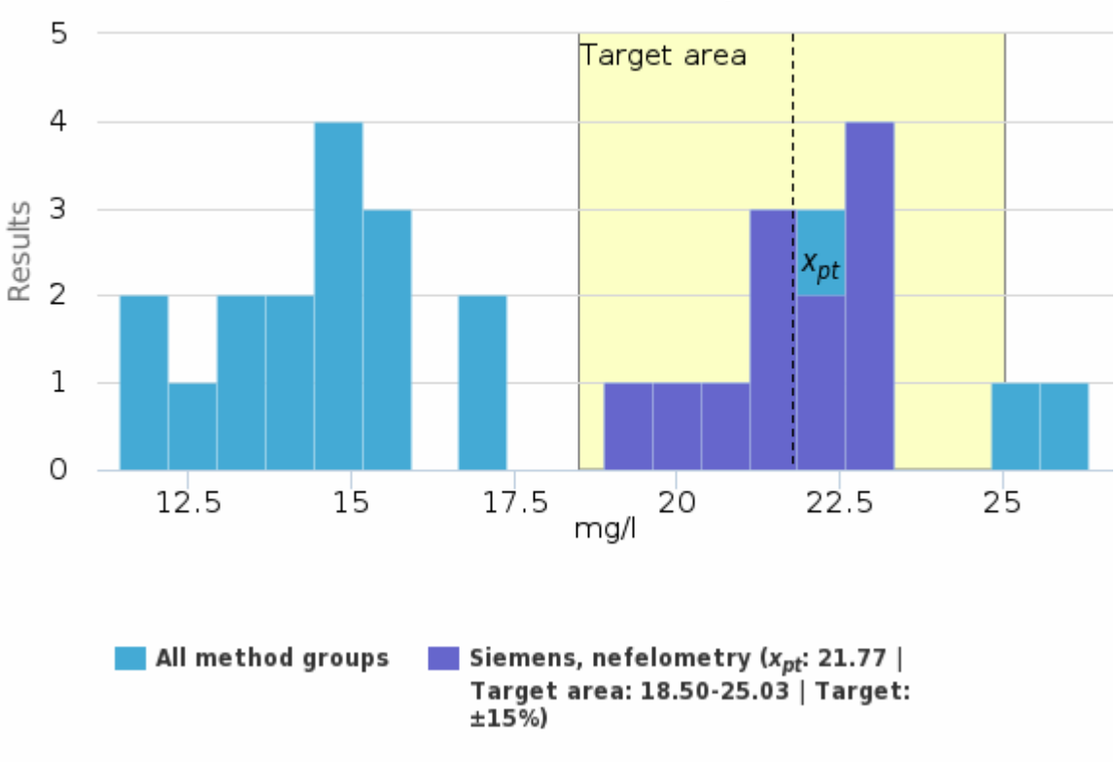
Specimen S001 | IgLCLambda, free, mg/l

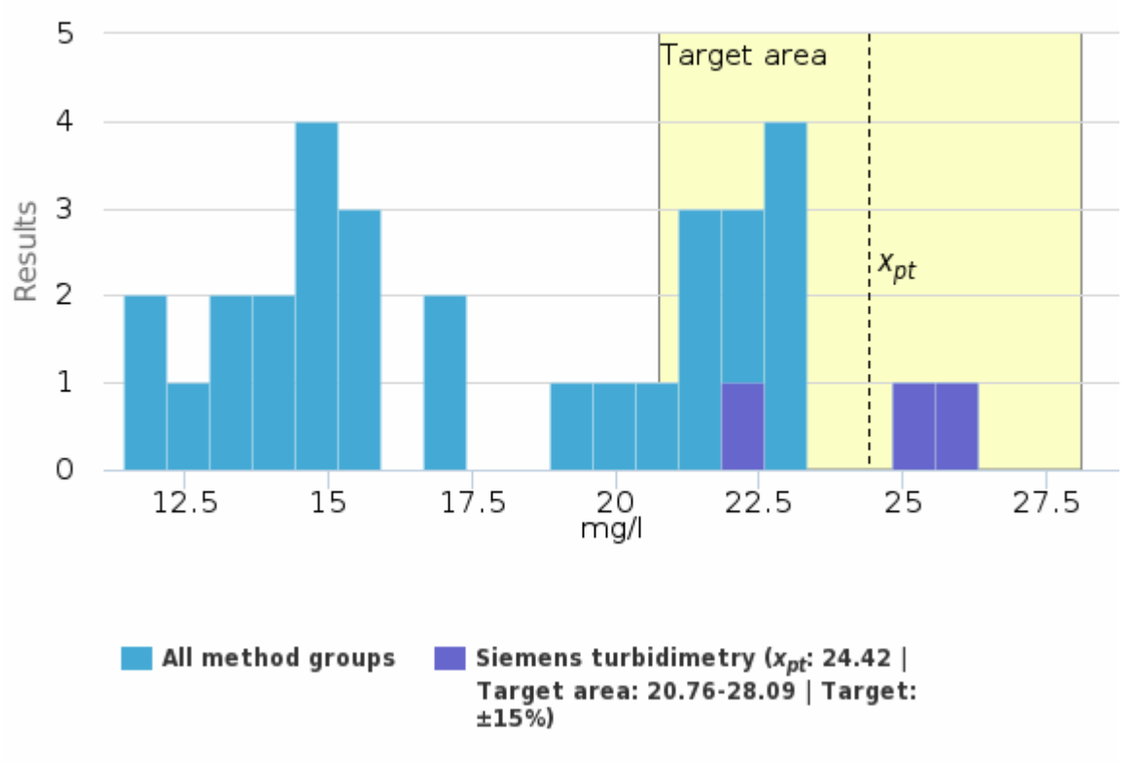
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Freelite, nefelometry	15.20	15.40	1.87	12.3	0.77	12.60	17.30	-	6
Freelite, turbidimetry	14.08	14.65	1.44	10.3	0.46	11.46	15.70	-	10
Siemens, nefelometry	21.77	21.90	1.33	6.1	0.38	19.00	23.30	-	12
Siemens turbidimetry	24.42	25.07	2.27	9.3	1.31	21.90	26.30	-	3
All	**18.27**	**17.30**	**4.31**	**23.6**	**0.77**	**11.46**	**26.30**	**-**	**31**

Specimen S001 | IgLCLambda, free, mg/l| histogram summaries in LabScala





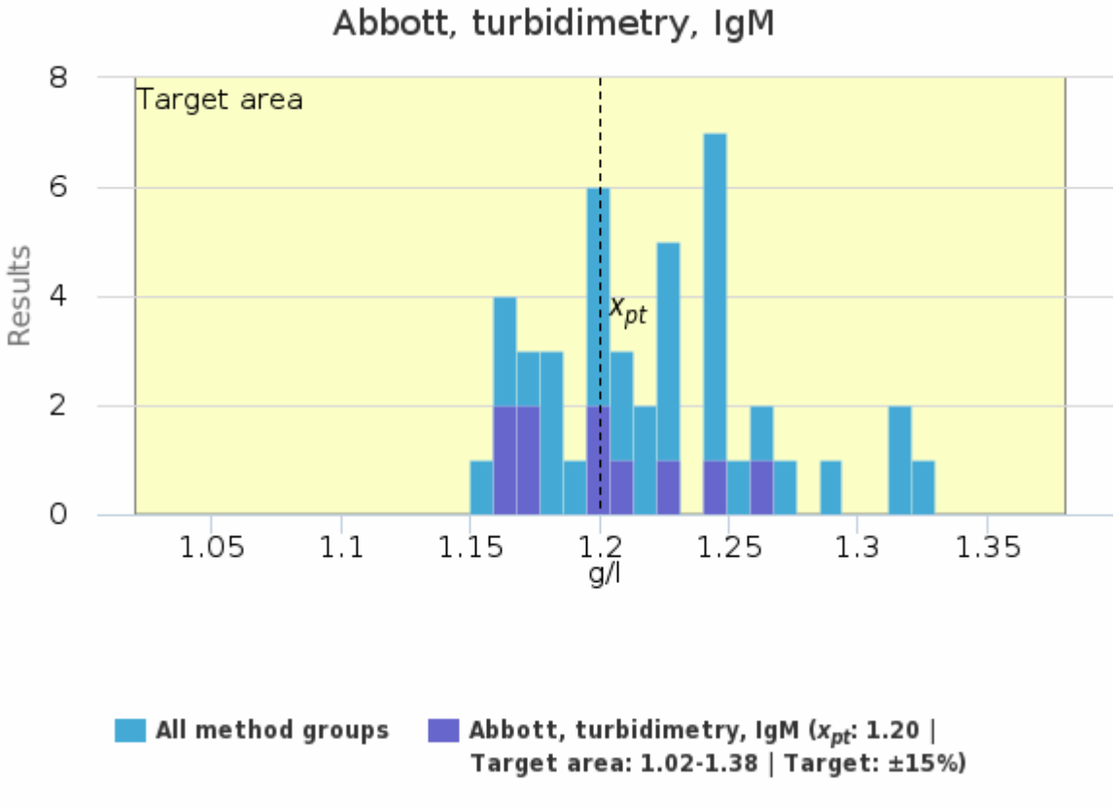


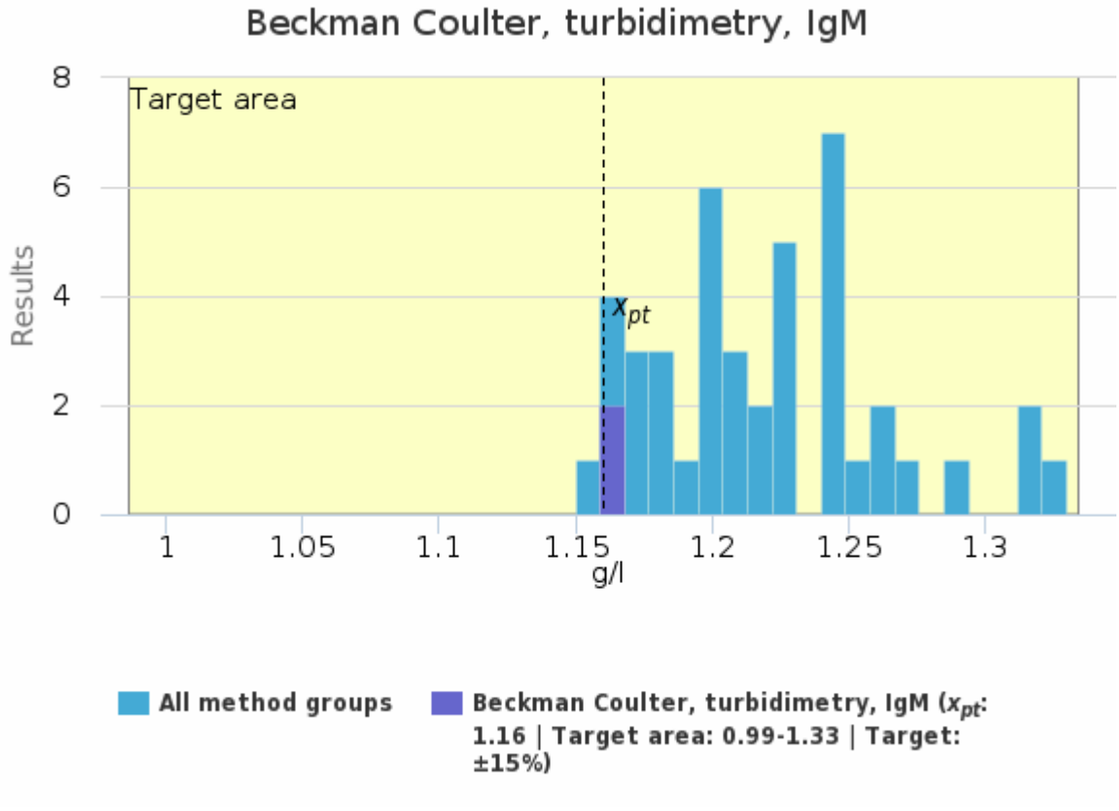


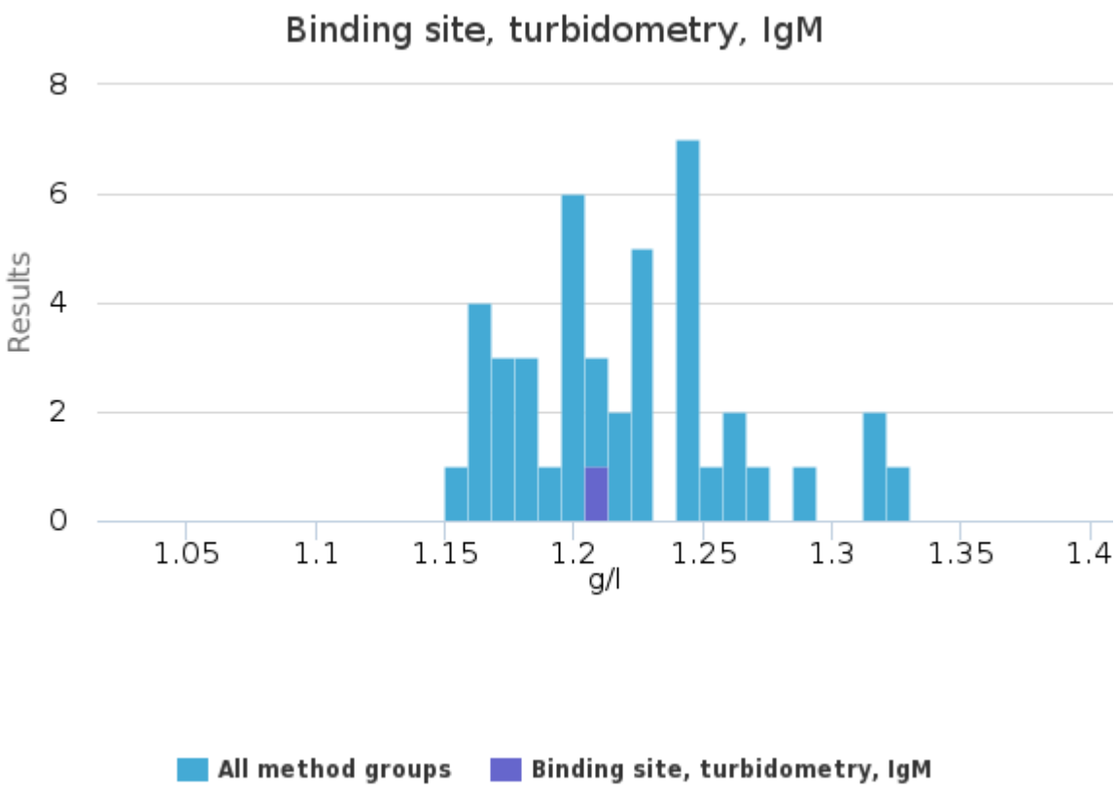
Specimen S001 | IgM, g/l

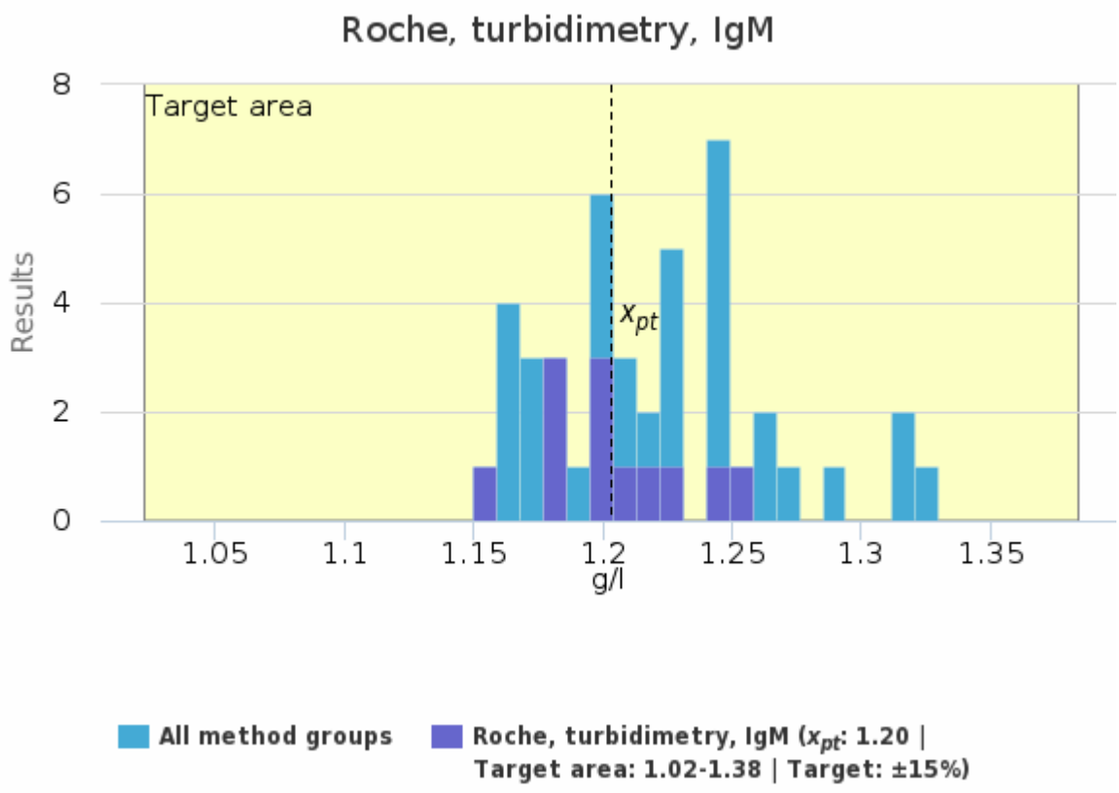
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, IgM	1.20	1.20	0.03	2.9	0.01	1.16	1.26	-	10
Beckman Coulter, turbidimetry, IgM	1.16	1.16	<0.01	<0.1	<0.01	1.16	1.16	-	2
Binding site, turbidometry, IgM	-	-	-	-	-	1.21	1.21	-	1
Roche, turbidimetry, IgM	1.20	1.20	0.03	2.4	<0.01	1.15	1.25	-	12
Siemens, nefelometry, IgM	1.26	1.24	0.04	3.2	0.01	1.20	1.33	-	14
Siemens, turbidimetry, IgM	1.21	1.23	0.03	2.8	0.02	1.17	1.23	-	3
Thermo Scientific, turbidimetry, IgM	-	-	-	-	-	1.19	1.19	-	1
All	**1.22**	**1.22**	**0.04**	**3.6**	**<0.01**	**1.15**	**1.33**	**-**	**43**

Specimen S001 | IgM, g/l| histogram summaries in LabScala



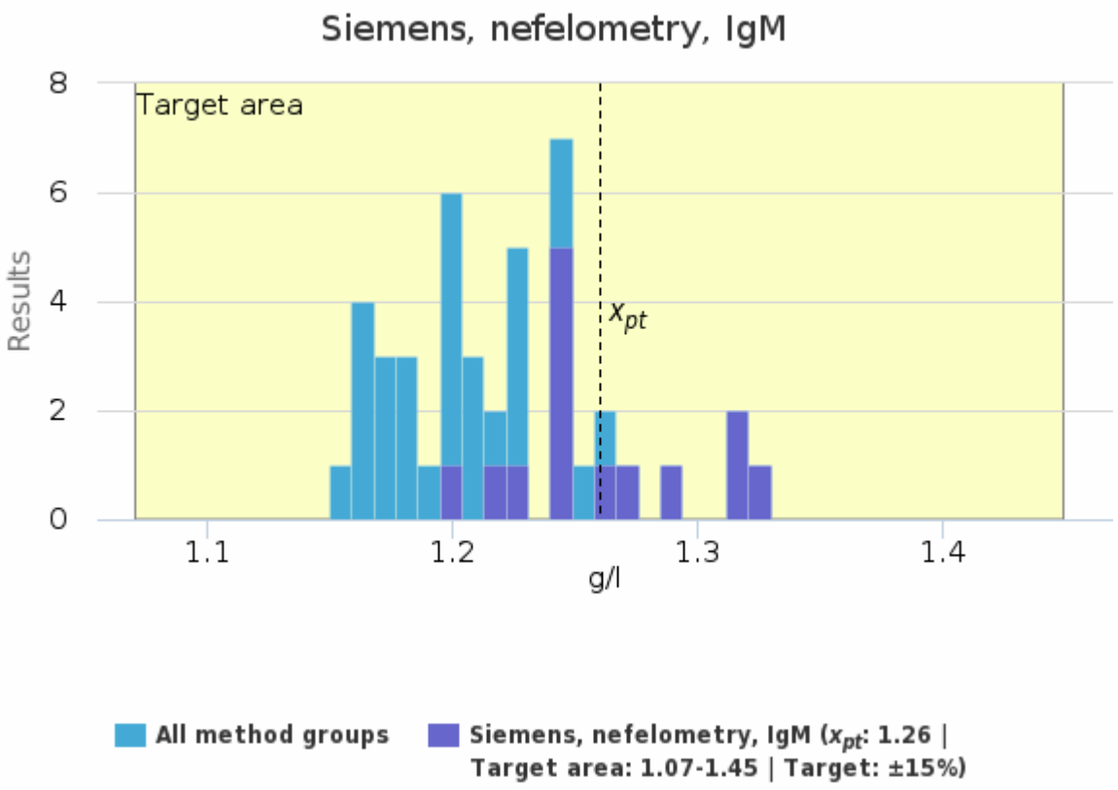


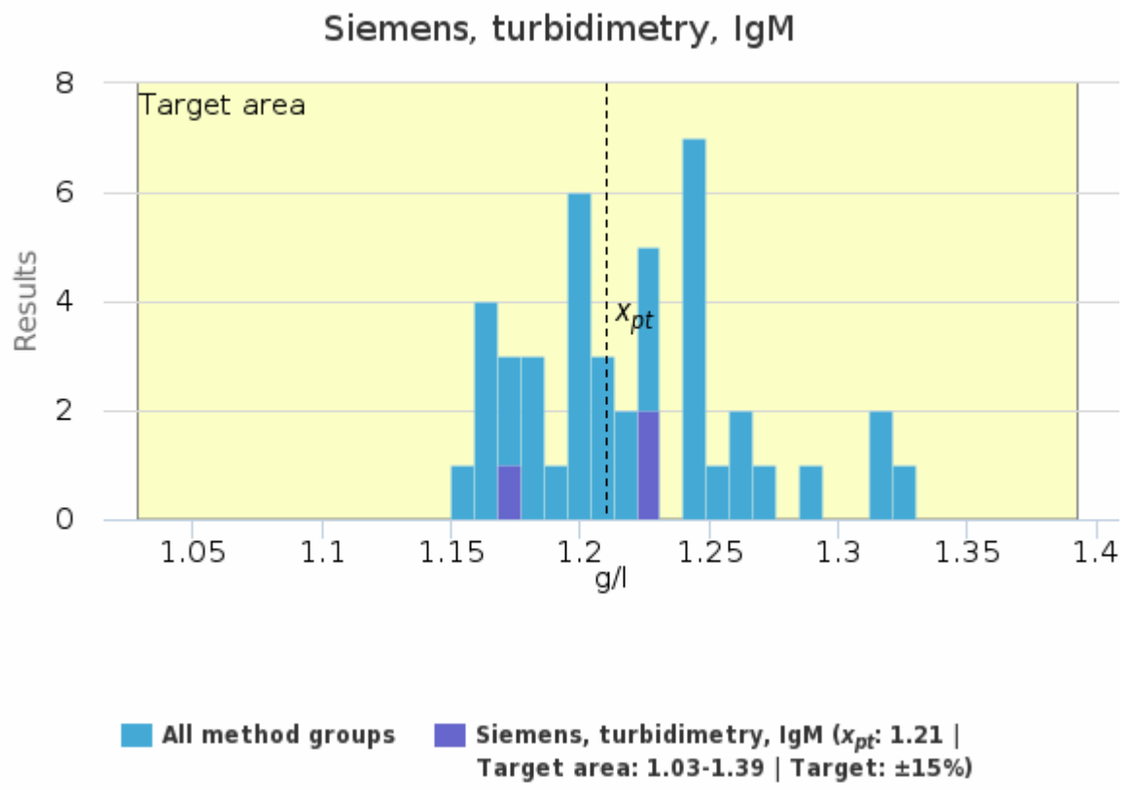


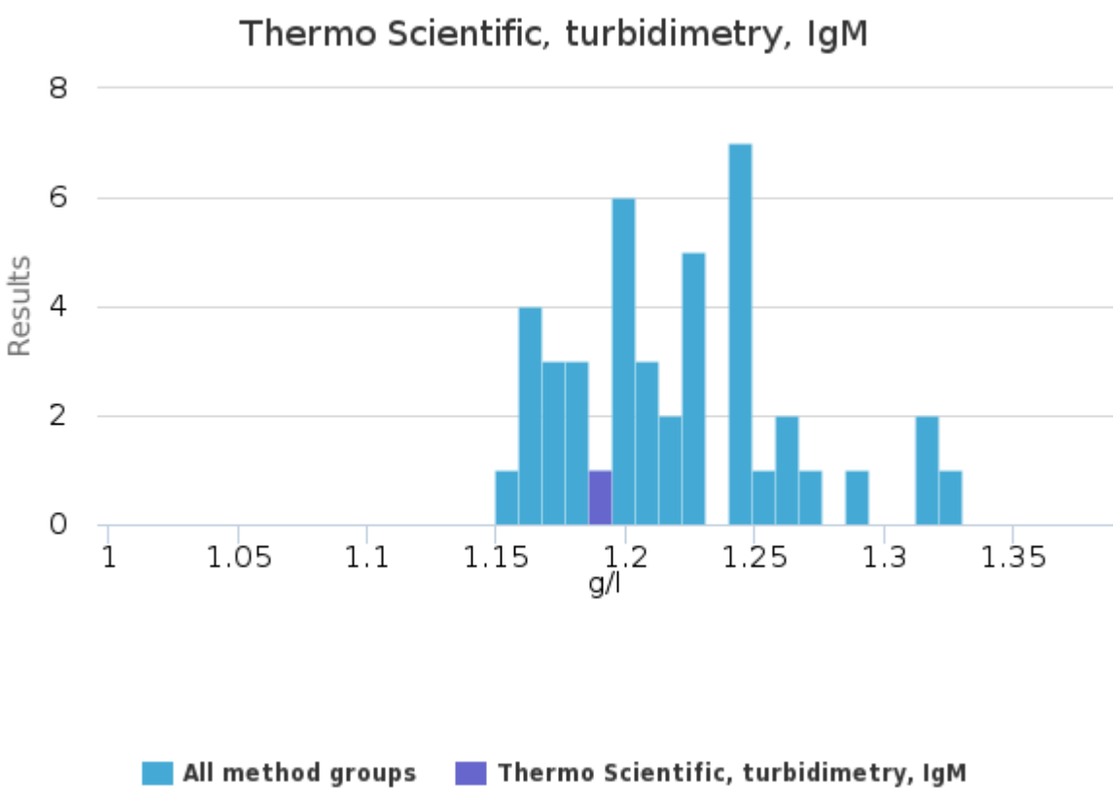


Proteins, immunochemical determinations, January, 1-2023

Quantitative report



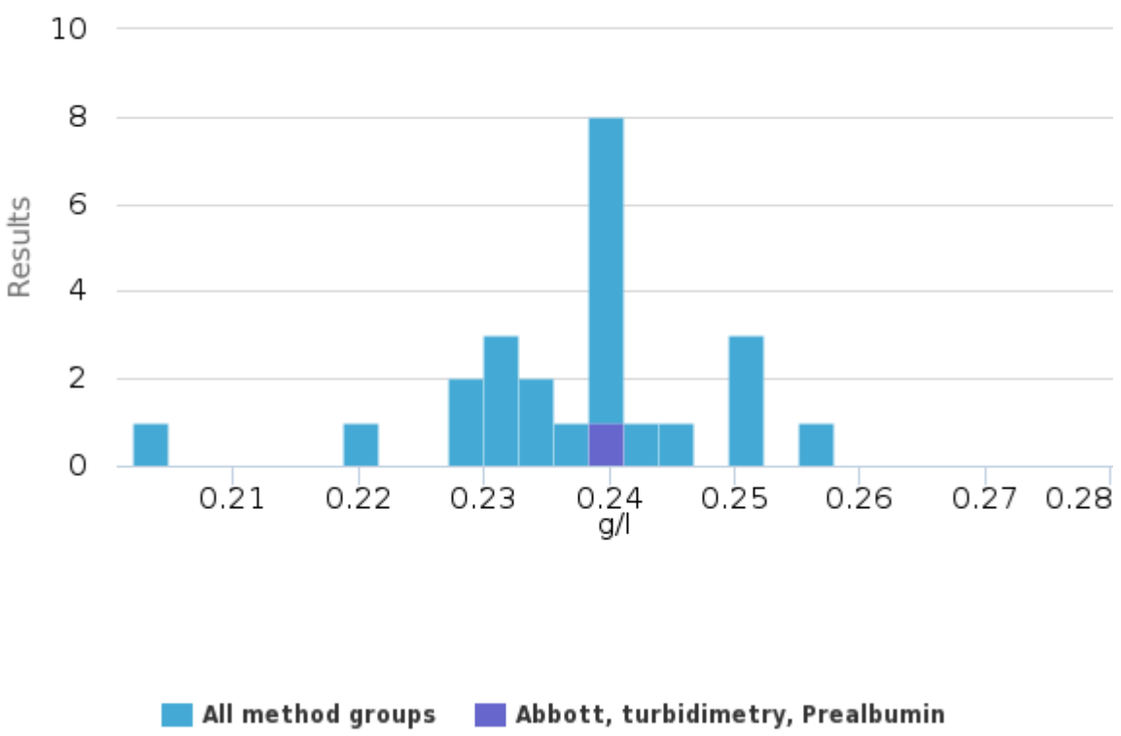


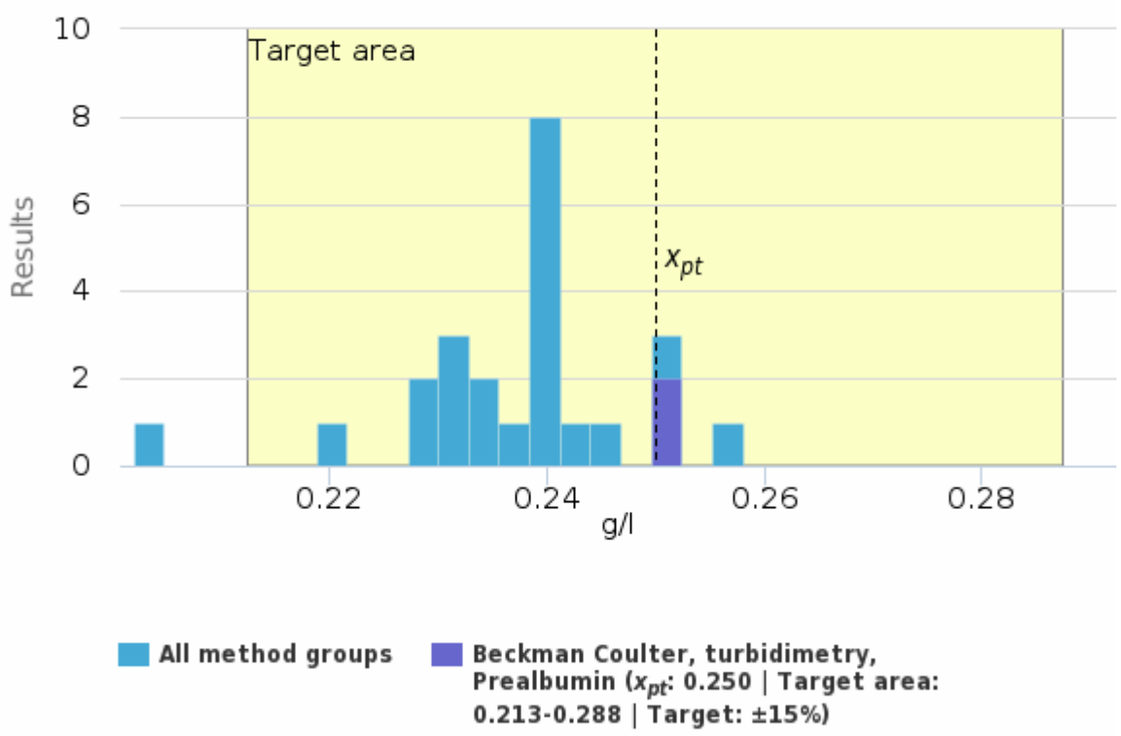


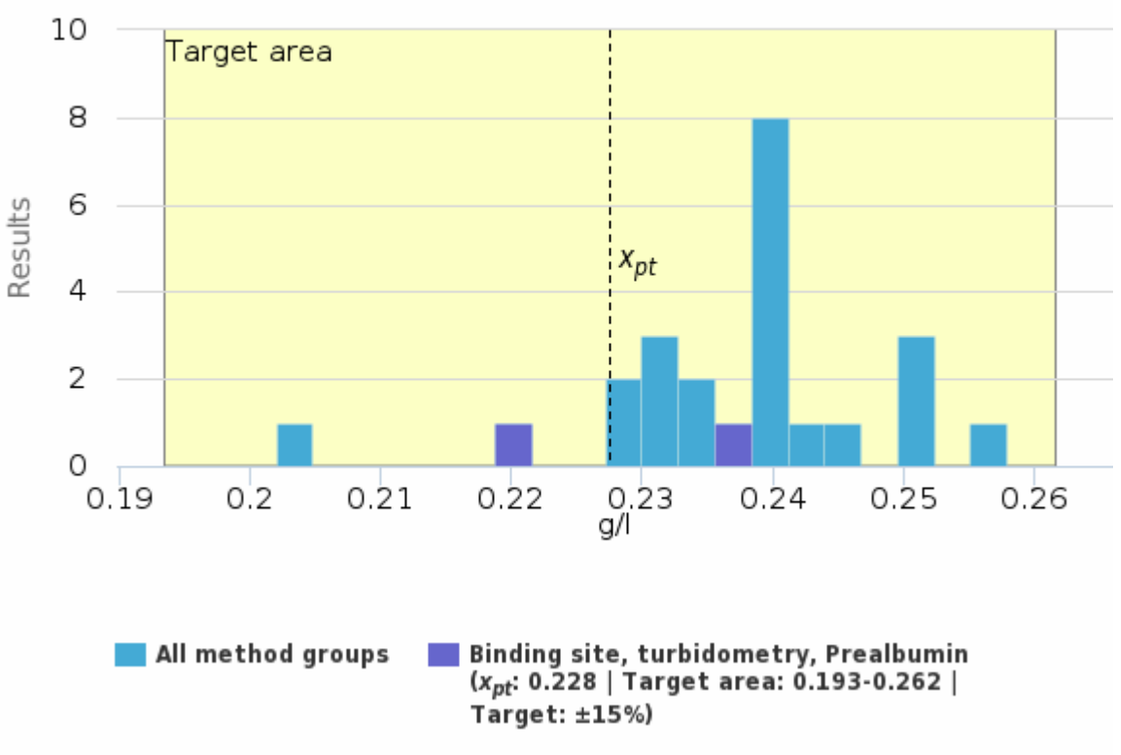
Specimen S001 | Prealbumin / Transtyretin, g/l

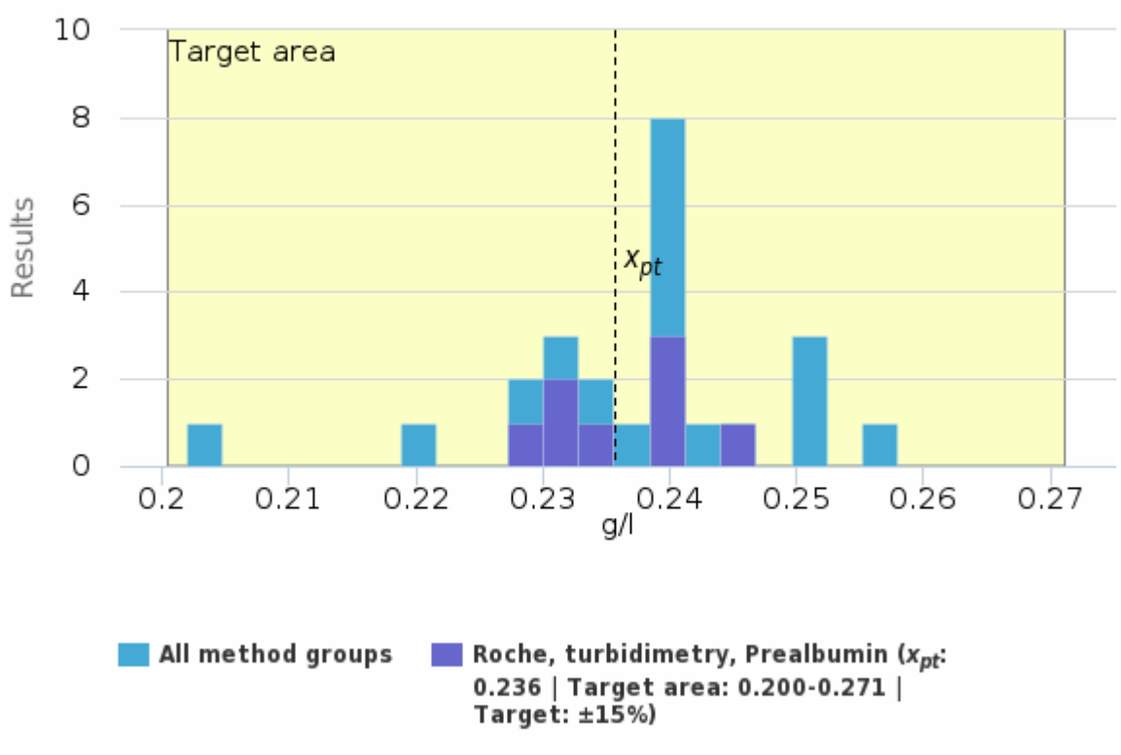
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Prealbumin	-	-	-	-	-	0.240	0.240	-	1
Beckman Coulter, turbidimetry, Prealbumin	0.250	0.250	<0.001	<0.1	<0.001	0.250	0.250	-	2
Binding site, turbidometry, Prealbumin	0.228	0.228	0.012	5.3	0.009	0.219	0.236	-	2
Roche, turbidimetry, Prealbumin	0.236	0.237	0.006	2.5	0.002	0.228	0.244	-	8
Siemens, nefelometry, Prealbumin	0.237	0.240	0.016	6.7	0.005	0.202	0.258	-	9
Siemens, turbidimetry, Prealbumin	0.235	0.235	0.007	3.0	0.005	0.230	0.240	-	2
All	**0.238**	**0.240**	**0.009**	**3.7**	**0.002**	**0.219**	**0.258**	**1**	**24**

Specimen S001 | Prealbumin / Transtyretin, g/l| histogram summaries in LabScala



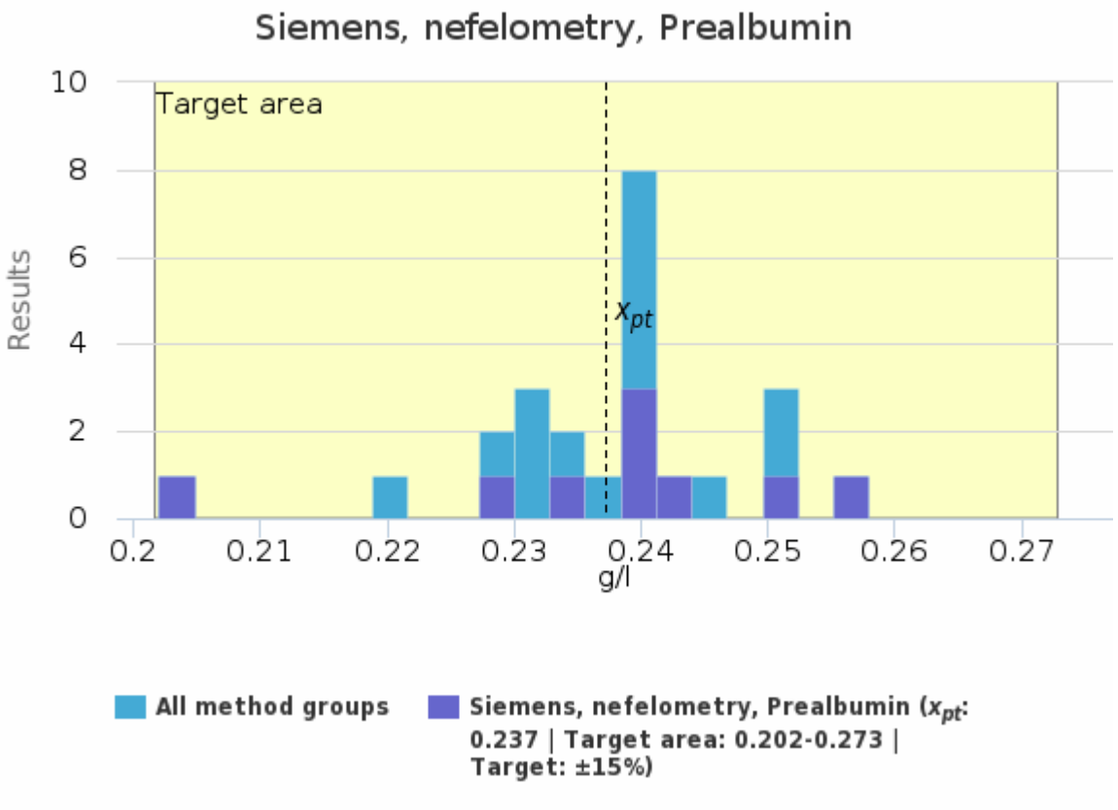


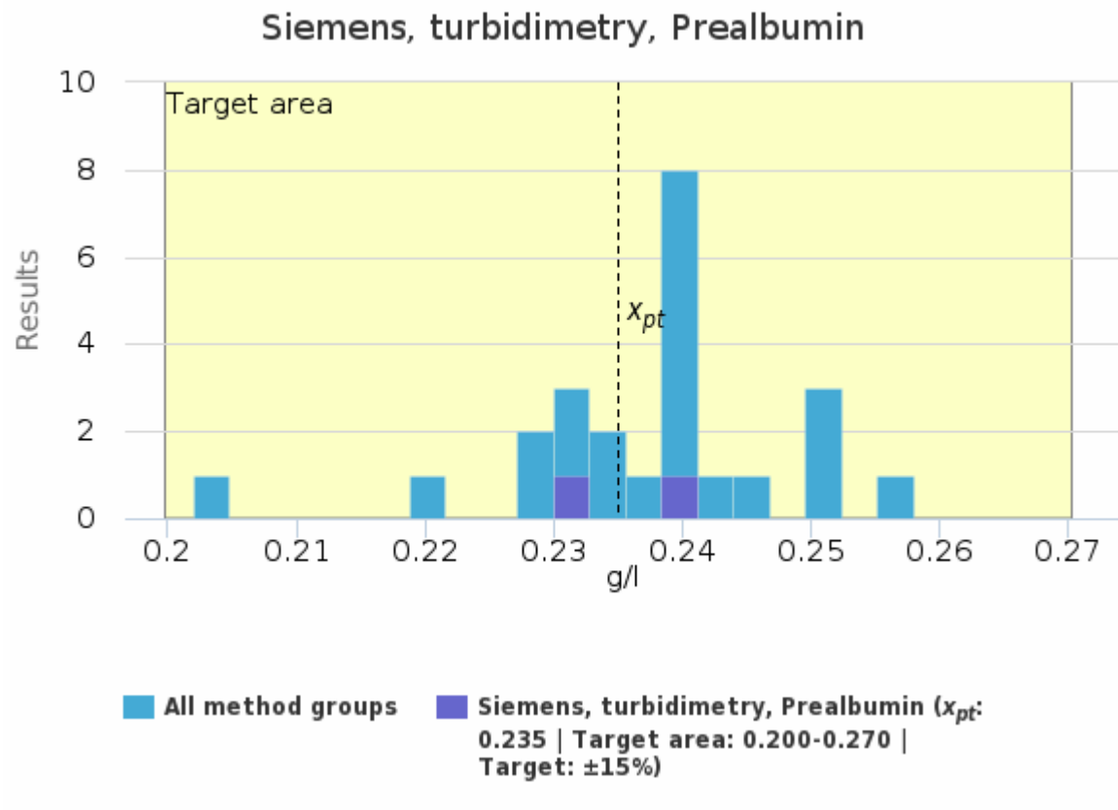




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

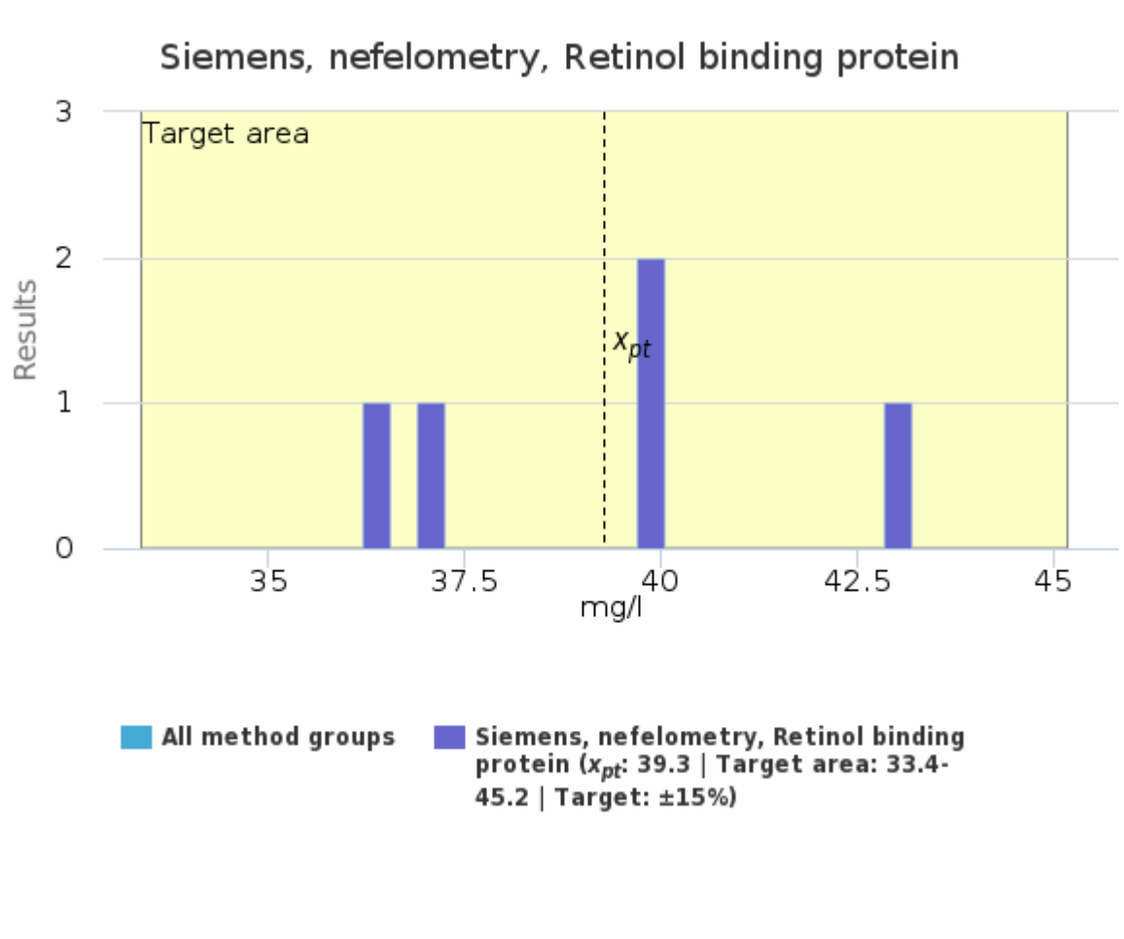




Specimen S001 | Retinol Binding Prot, mg/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Siemens, nefelometry, Retinol binding protein	39.3	40.0	2.8	7.1	1.2	36.2	43.2	-	5
All	**39.3**	**40.0**	**2.8**	**7.1**	**1.2**	**36.2**	**43.2**	**-**	**5**

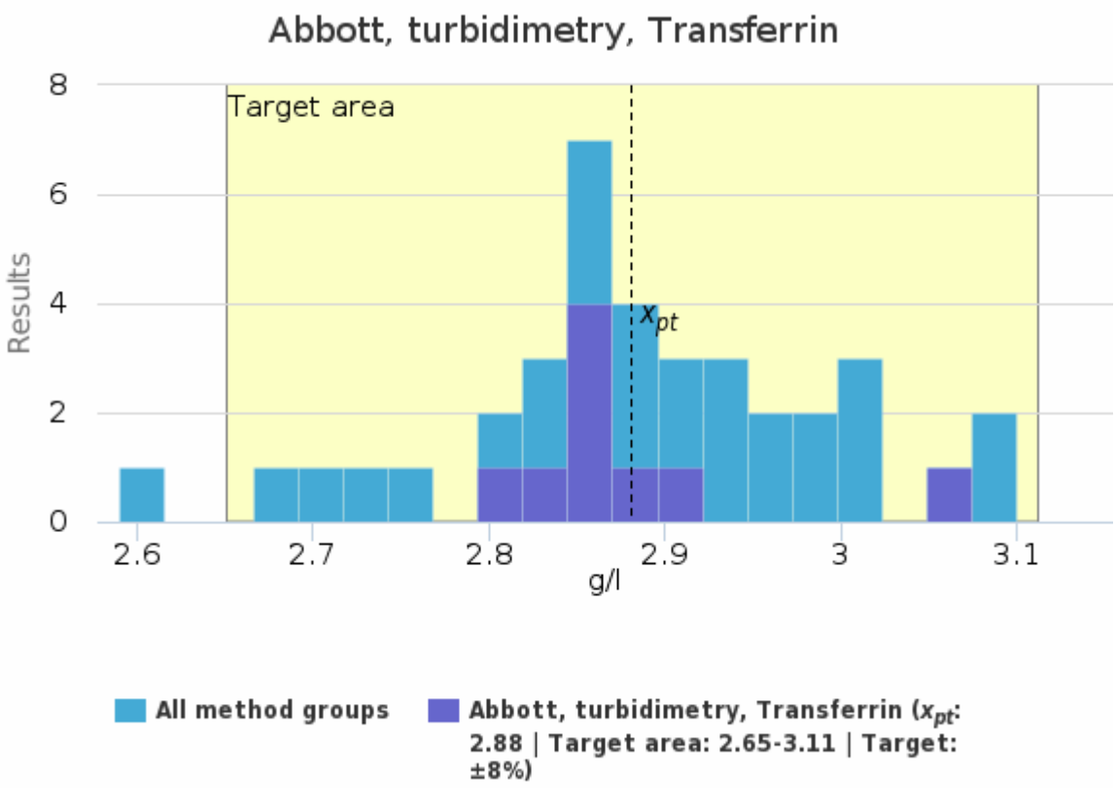
Specimen S001 | Retinol Binding Prot, mg/l| histogram summaries in LabScala

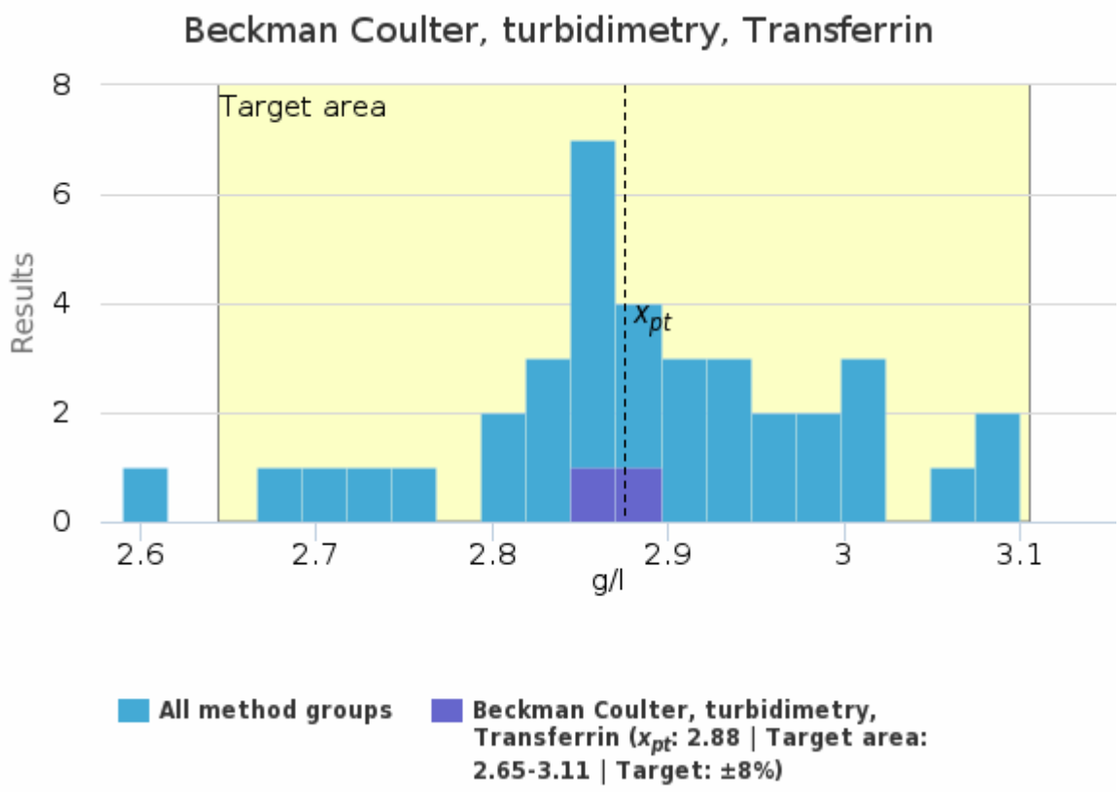


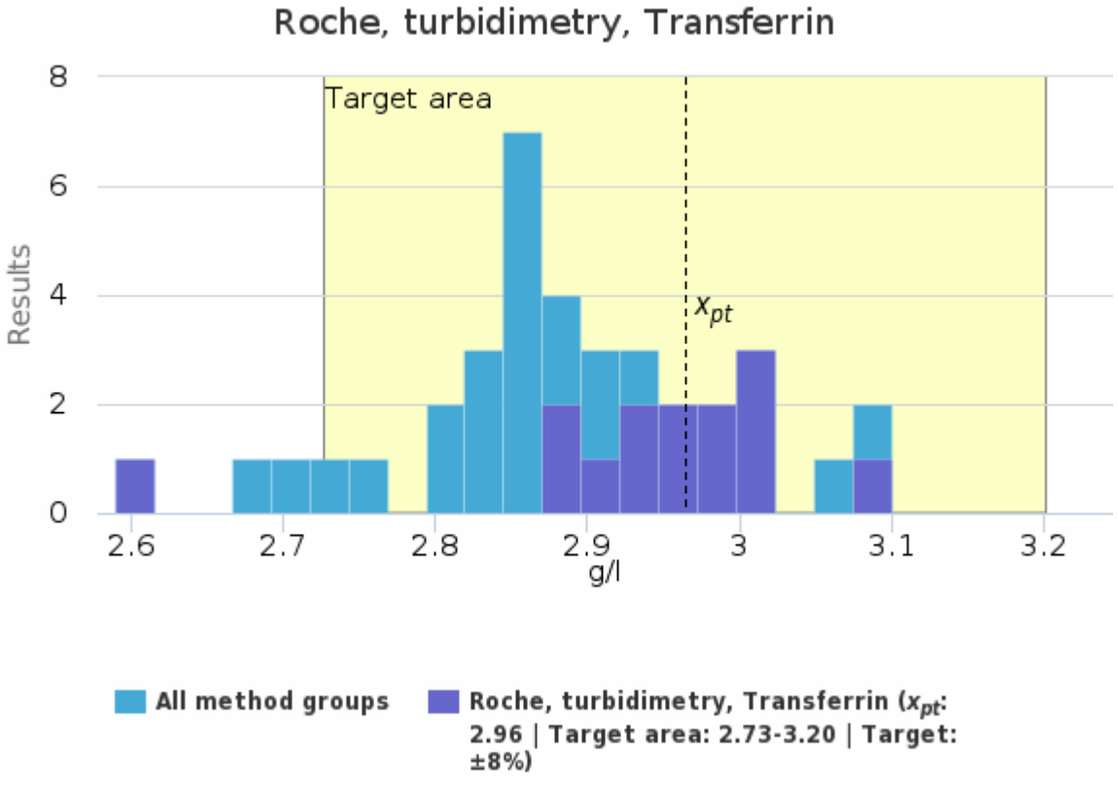
Specimen S001 | Transferrin, g/l

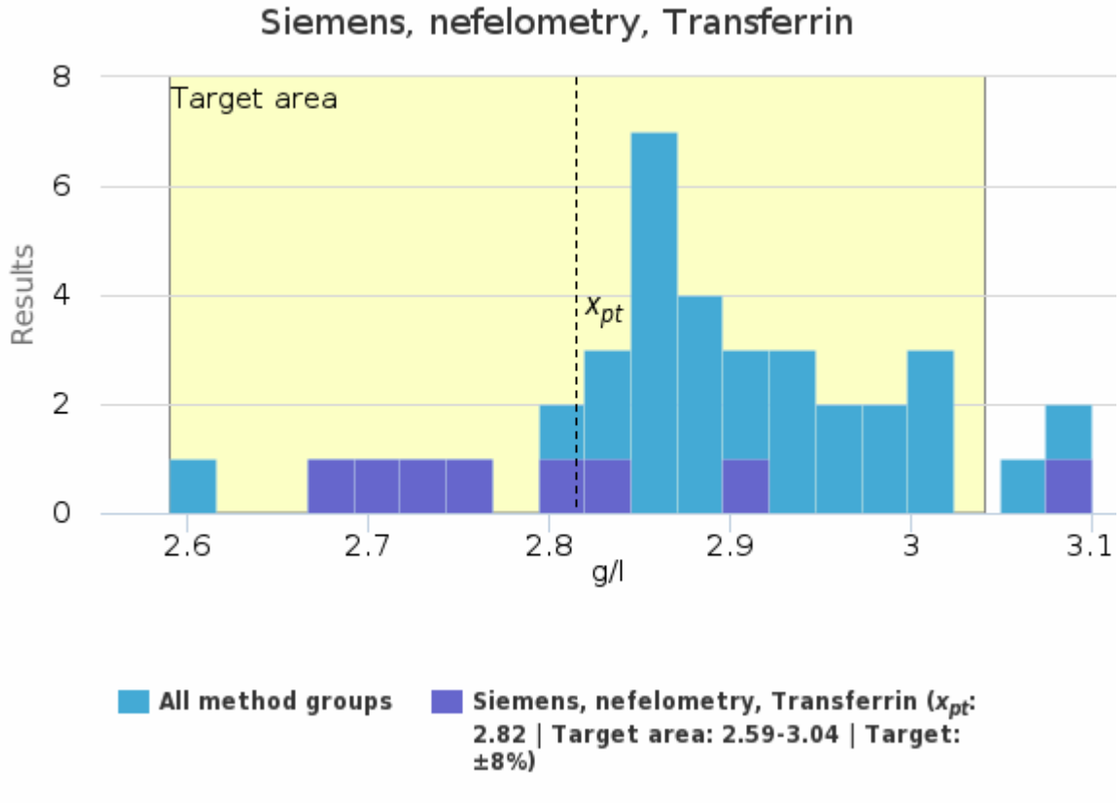
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Transferrin	2.88	2.87	0.08	2.7	0.03	2.80	3.07	-	9
Beckman Coulter, turbidimetry, Transferrin	2.88	2.88	<0.01	0.2	<0.01	2.87	2.88	-	2
Roche, turbidimetry, Transferrin	2.96	2.95	0.05	1.8	0.01	2.89	3.08	1	14
Siemens, nefelometry, Transferrin	2.82	2.78	0.14	4.9	0.05	2.67	3.10	-	8
Siemens, turbidimetry, Transferrin	2.88	2.87	0.05	1.7	0.03	2.83	2.93	-	3
Thermo Scientific, turbidimetry, Transferrin	-	-	-	-	-	2.87	2.87	-	1
All	**2.89**	**2.88**	**0.11**	**3.8**	**0.02**	**2.59**	**3.10**	**-**	**37**

Specimen S001 | Transferrin, g/l| histogram summaries in LabScala



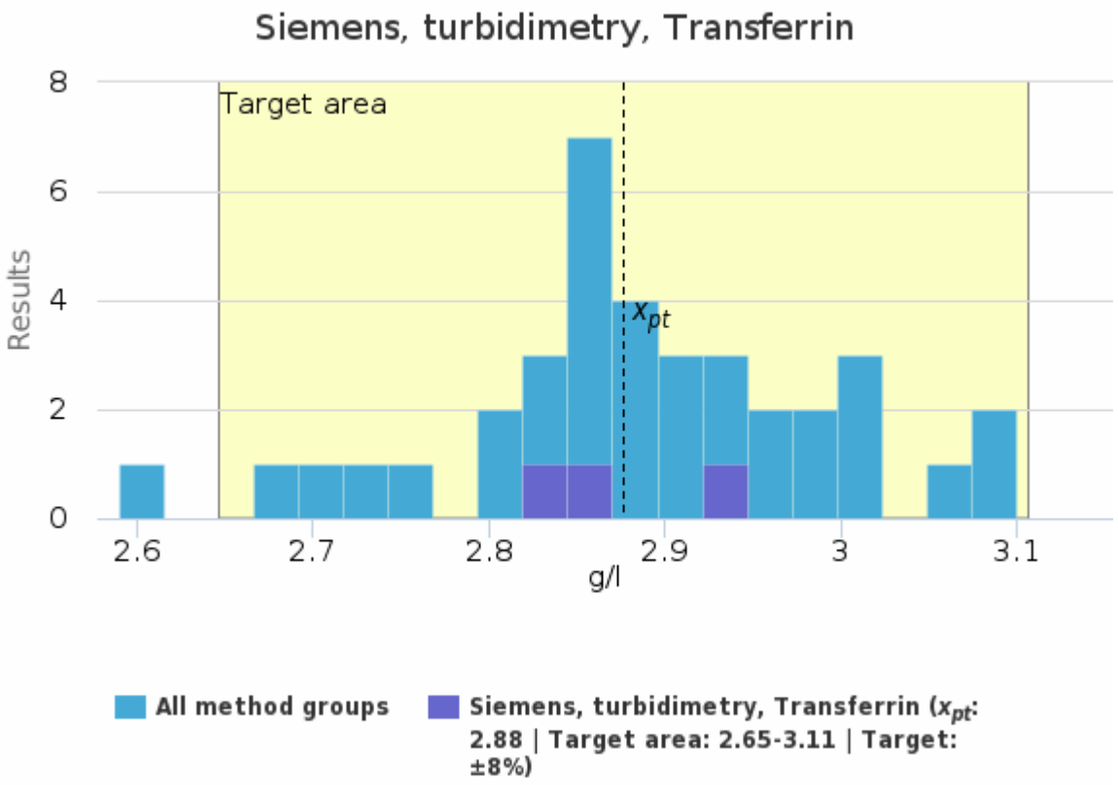


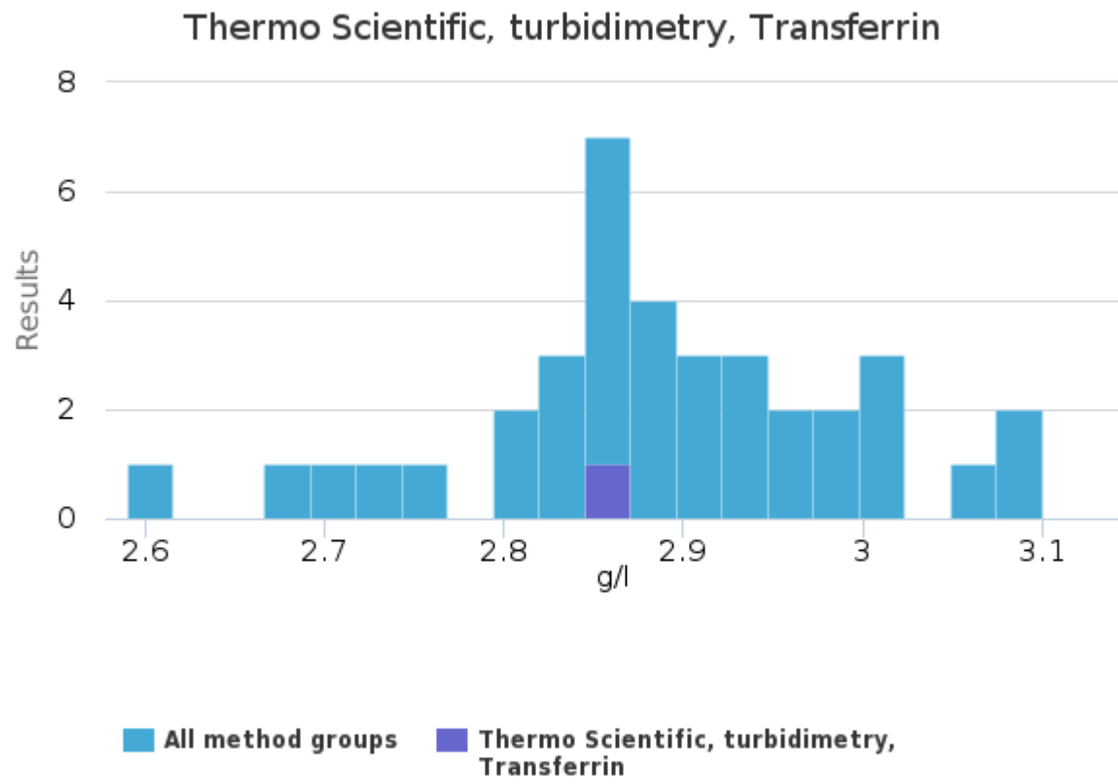




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

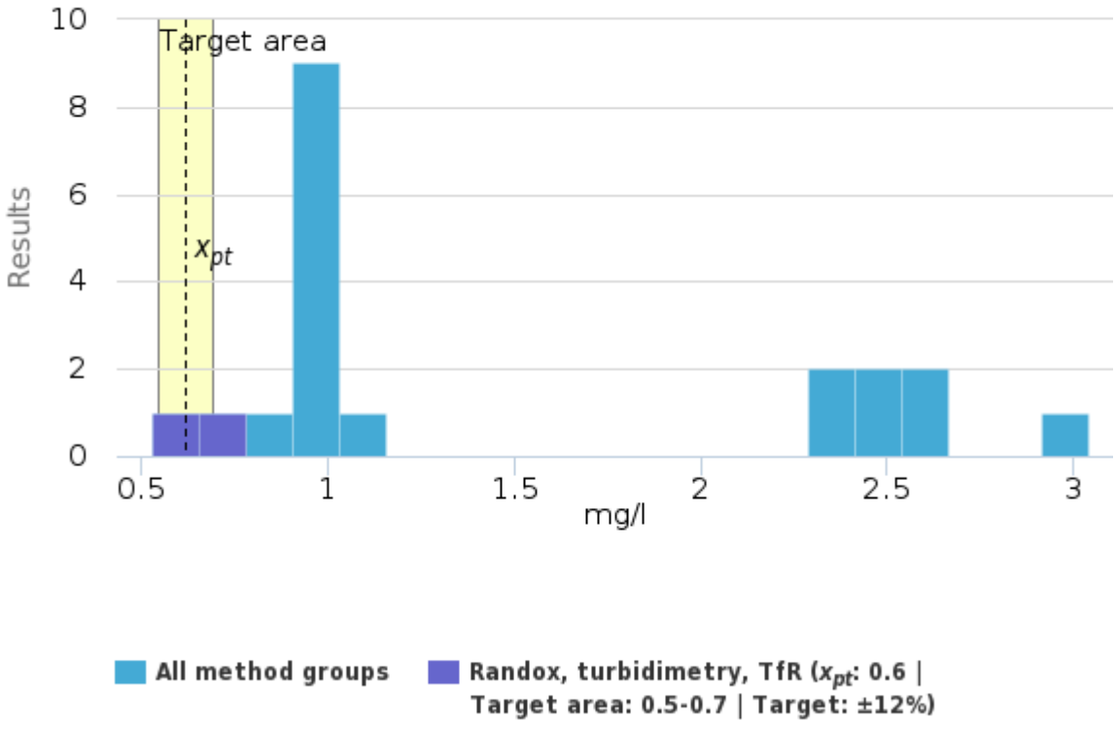


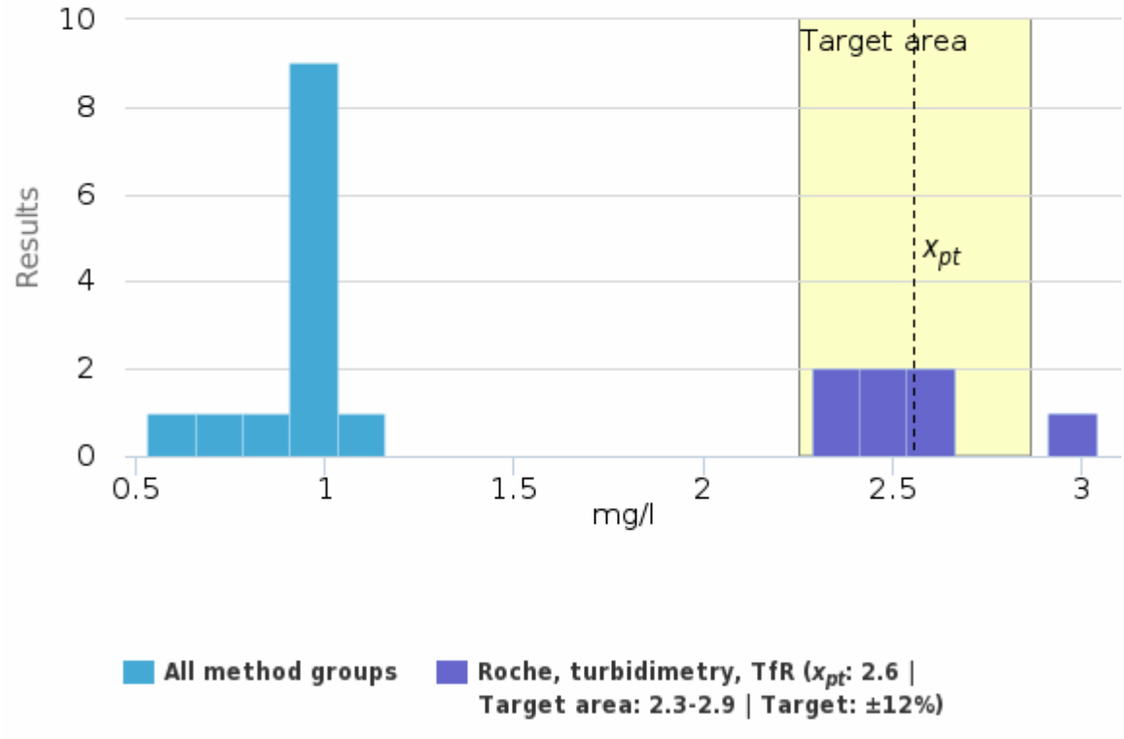


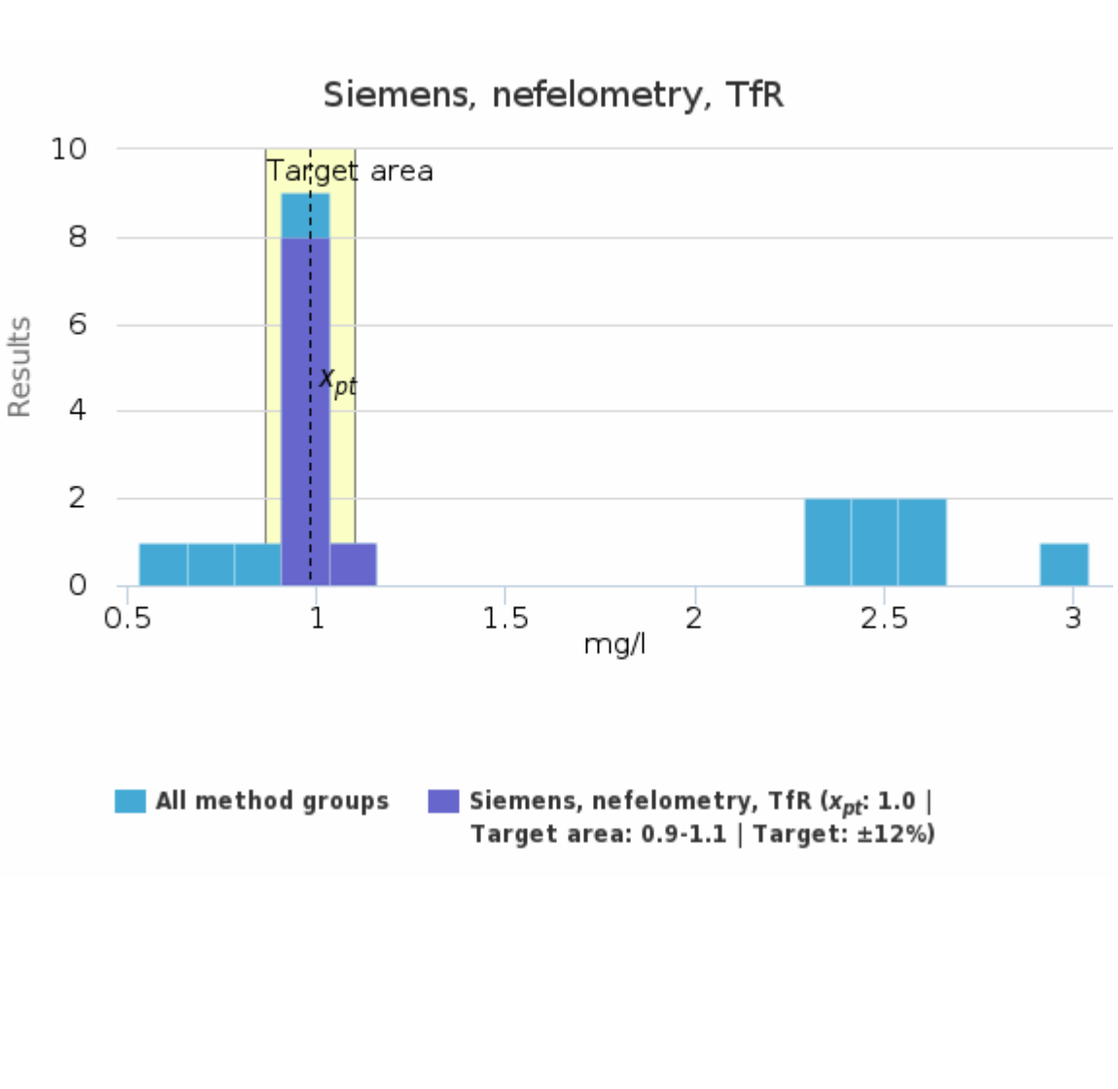
Specimen S001 | Transferrin receptor, mg/l

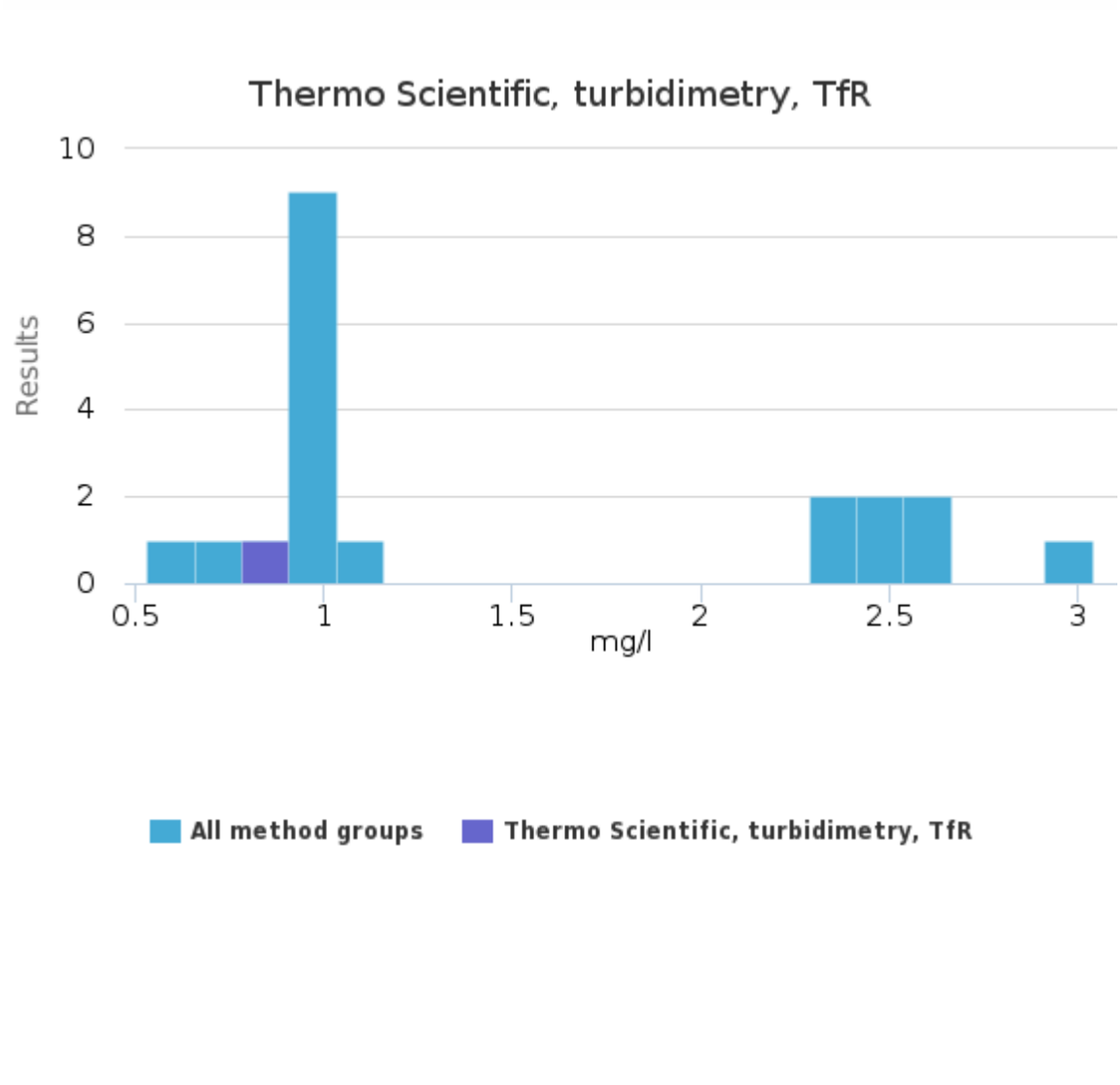
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Randox, turbidimetry, TfR	0.6	0.6	0.1	20.2	<0.1	0.5	0.7	-	2
Roche, turbidimetry, TfR	2.6	2.5	0.2	9.3	<0.1	2.4	3.0	-	7
Siemens, nefelometry, TfR	1.0	1.0	<0.1	3.5	<0.1	1.0	1.1	-	9
Thermo Scientific, turbidimetry, TfR	-	-	-	-	-	0.8	0.8	-	1
Trimero Diagnostics (TfR)	-	-	-	-	-	1.0	1.0	-	1
All	**1.5**	**1.0**	**0.8**	**55.2**	**0.2**	**0.5**	**3.0**	**-**	**20**

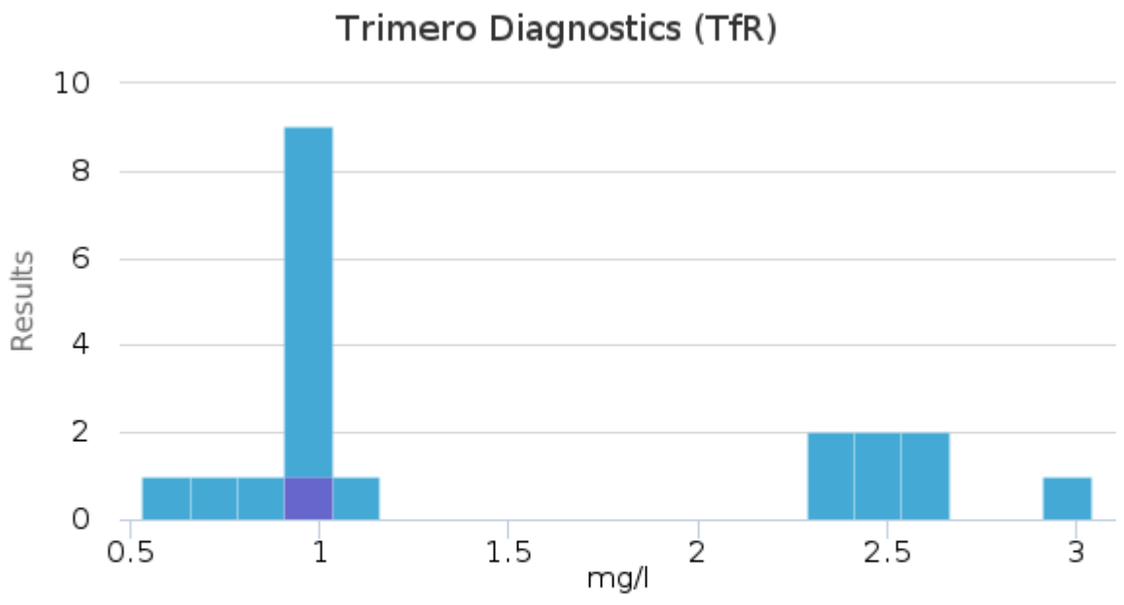
Specimen S001 | Transferrin receptor, mg/l| histogram summaries in LabScala







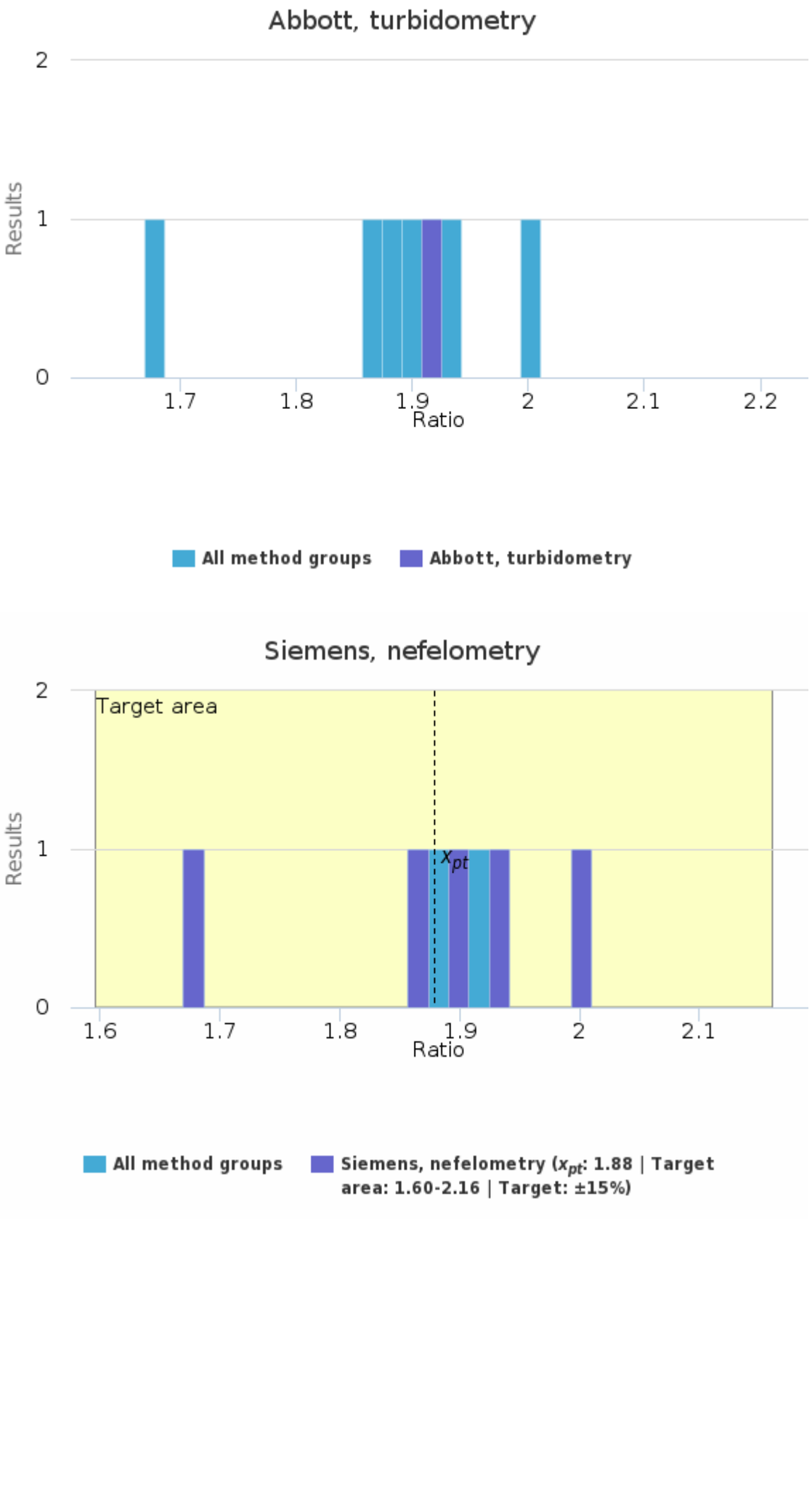


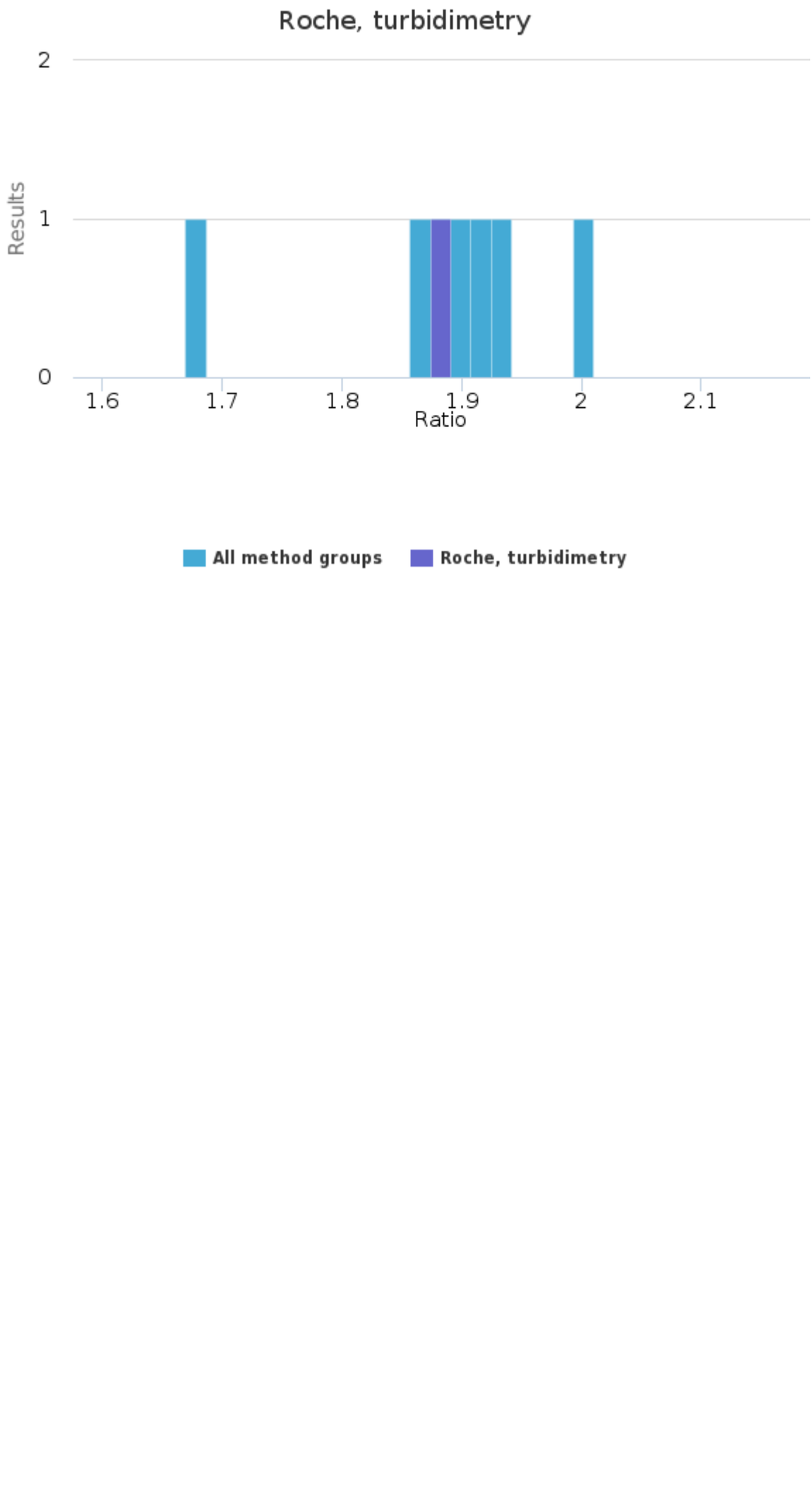


Specimen S001 | IgLCKappa/Lambda, total, Ratio

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidometry	-	-	-	-	-	1.92	1.92	-	1
Roche, turbidimetry	-	-	-	-	-	1.88	1.88	-	1
Siemens, nefelometry	1.88	1.91	0.13	6.8	0.06	1.67	2.01	-	5
All	**1.89**	**1.91**	**0.11**	**5.6**	**0.04**	**1.67**	**2.01**	**-**	**7**

Specimen S001 | IgLCKappa/Lambda, total, Ratio| histogram summaries in LabScala

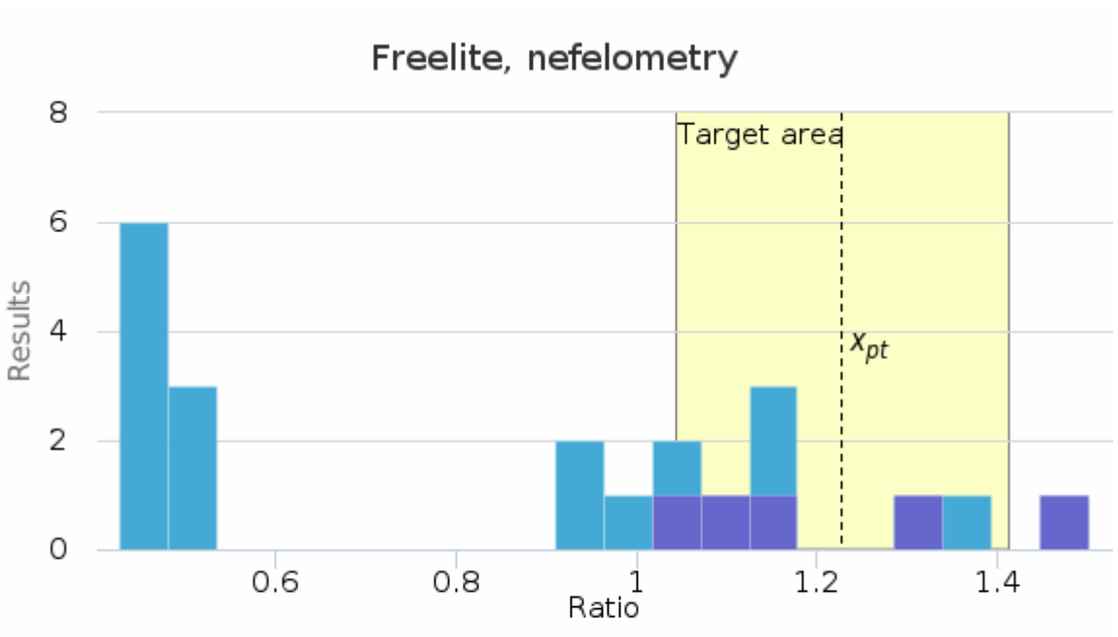


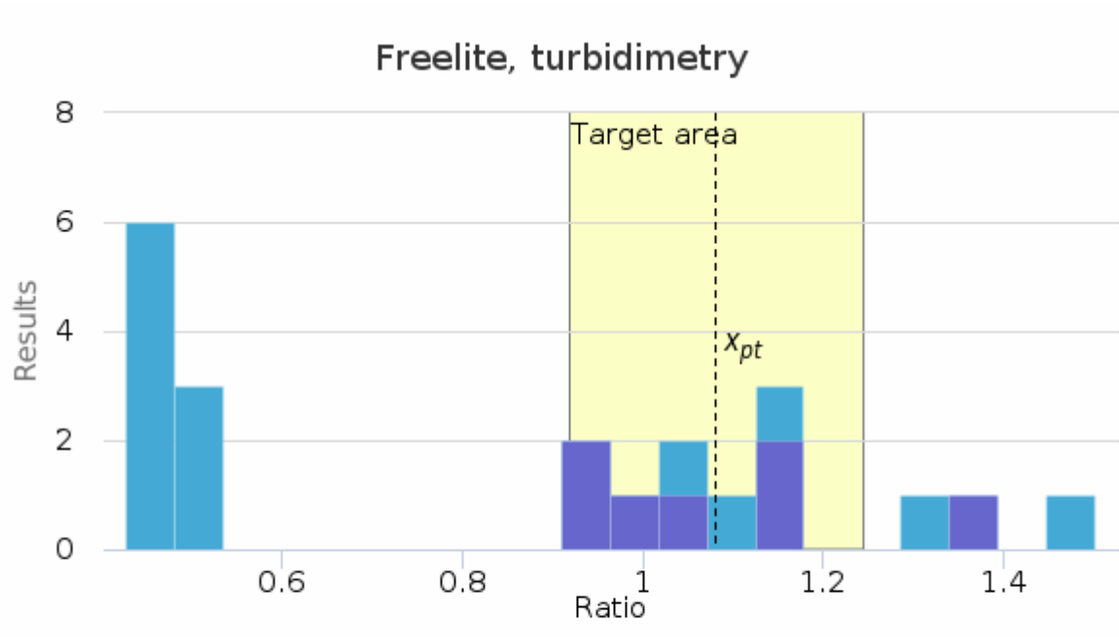


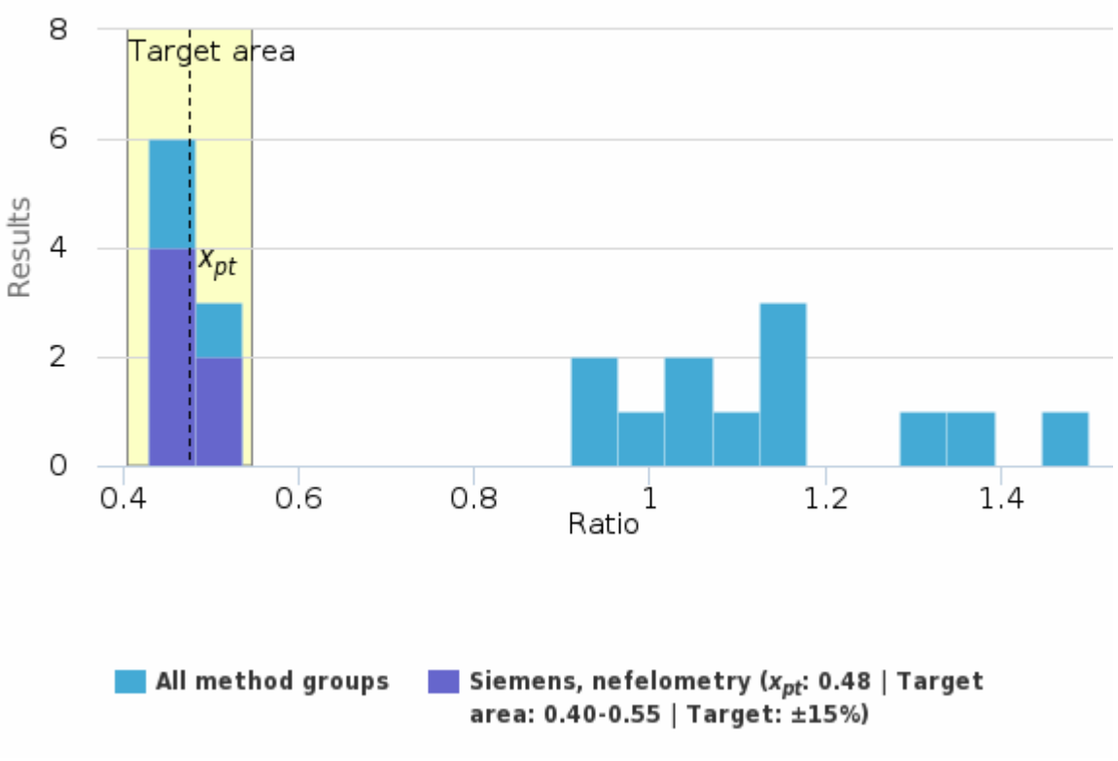
Specimen S001 | IgLCKappa/Lambda, free, Ratio

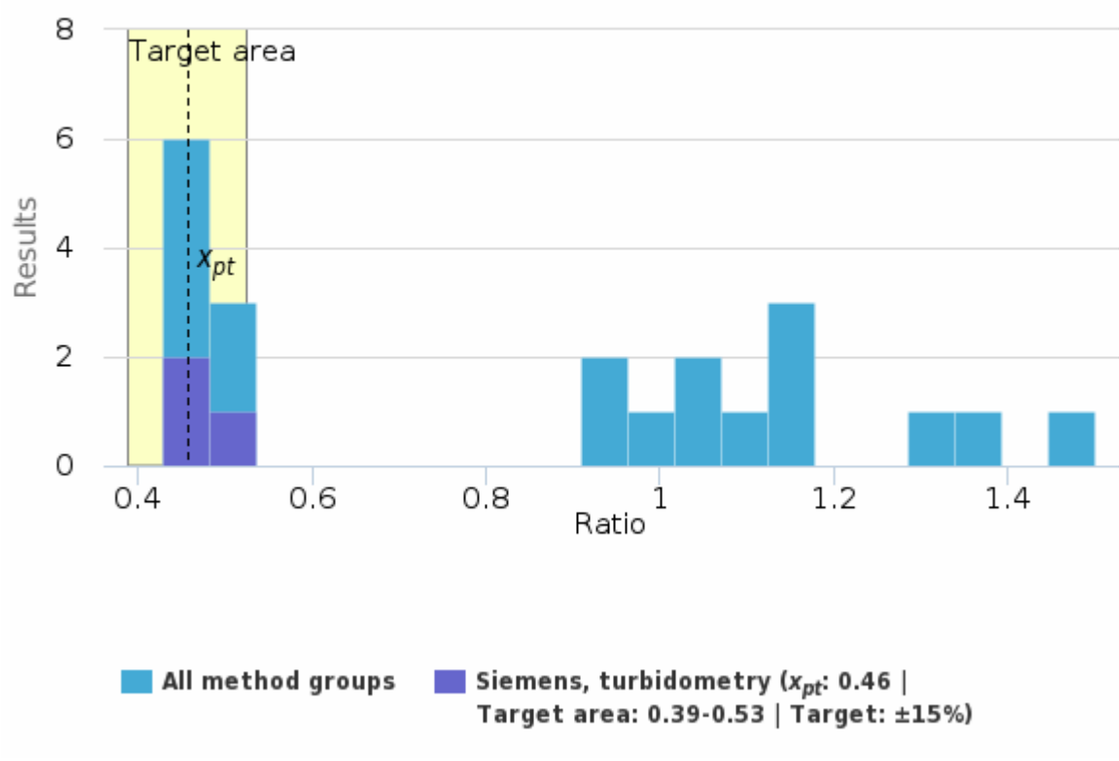
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Freelite, nefelometry	1.23	1.15	0.17	14.2	0.08	1.07	1.50	-	5
Freelite, turbidimetry	1.08	1.03	0.15	14.3	0.06	0.94	1.38	-	7
Siemens, nefelometry	0.48	0.47	0.02	4.6	<0.01	0.45	0.51	-	6
Siemens, turbidometry	0.46	0.44	0.04	8.4	0.02	0.43	0.50	-	3
All	**0.85**	**0.94**	**0.36**	**42.7**	**0.08**	**0.43**	**1.50**	**-**	**21**

Specimen S001 | IgLCKappa/Lambda, free, Ratio| histogram summaries in LabScala





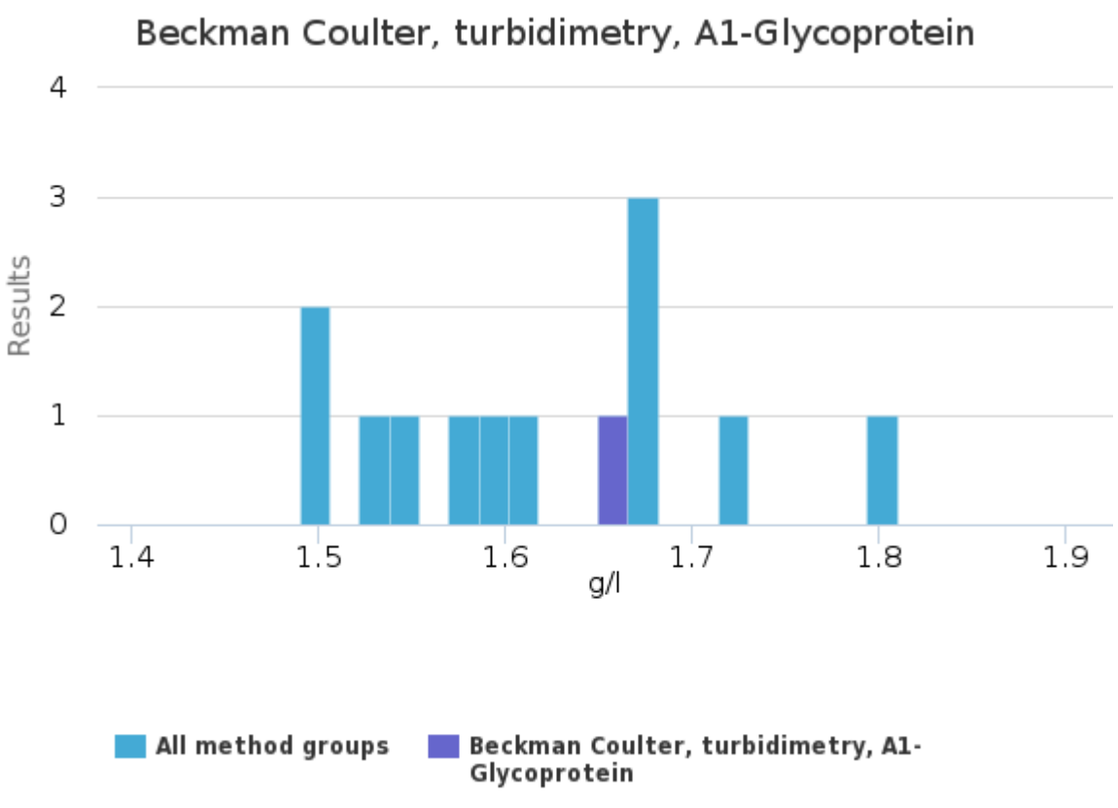


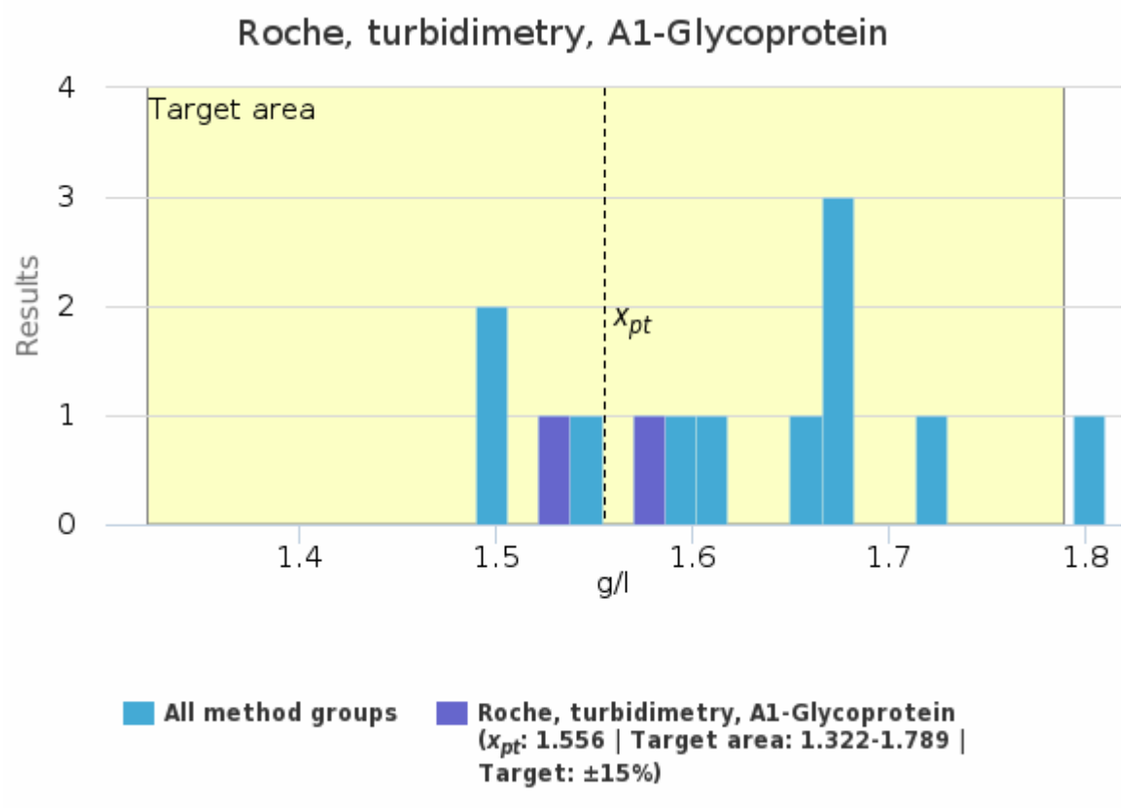


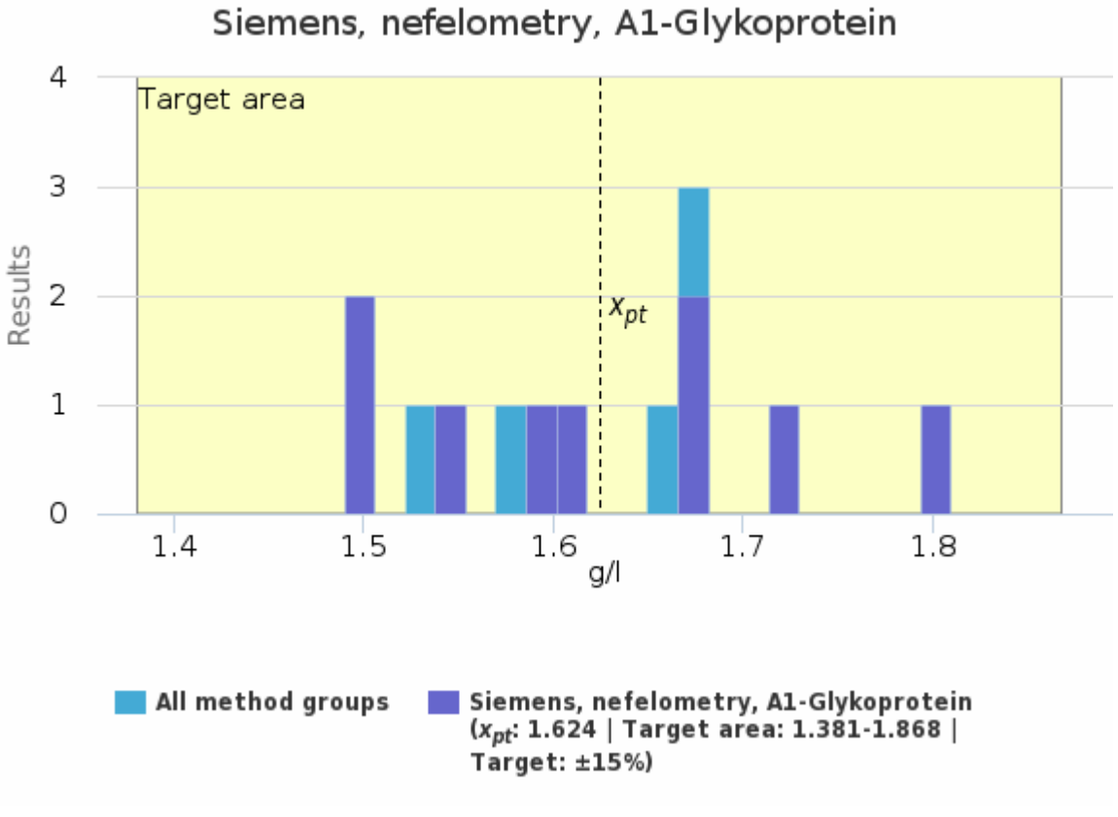
Specimen S002 | A1-Glykoprotein, g/l

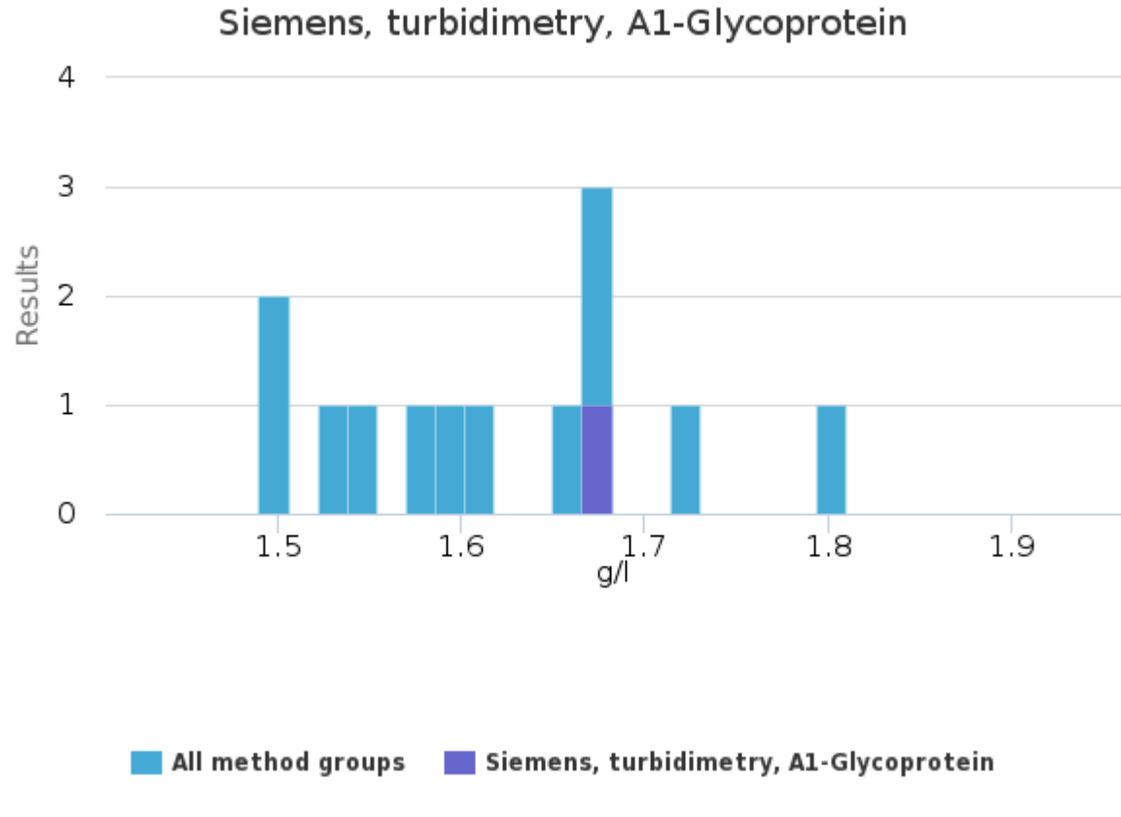
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Beckman Coulter, turbidimetry, A1-Glycoprotein	-	-	-	-	-	1.650	1.650	-	1
Roche, turbidimetry, A1-Glycoprotein	1.556	1.556	0.035	2.2	0.025	1.531	1.580	-	2
Siemens, nefelometry, A1-Glykoprotein	1.624	1.610	0.108	6.6	0.036	1.490	1.810	-	9
Siemens, turbidimetry, A1-Glycoprotein	-	-	-	-	-	1.680	1.680	-	1
All	**1.620**	**1.610**	**0.094**	**5.8**	**0.026**	**1.490**	**1.810**	**-**	**13**

Specimen S002 | A1-Glykoprotein, g/l| histogram summaries in LabScala





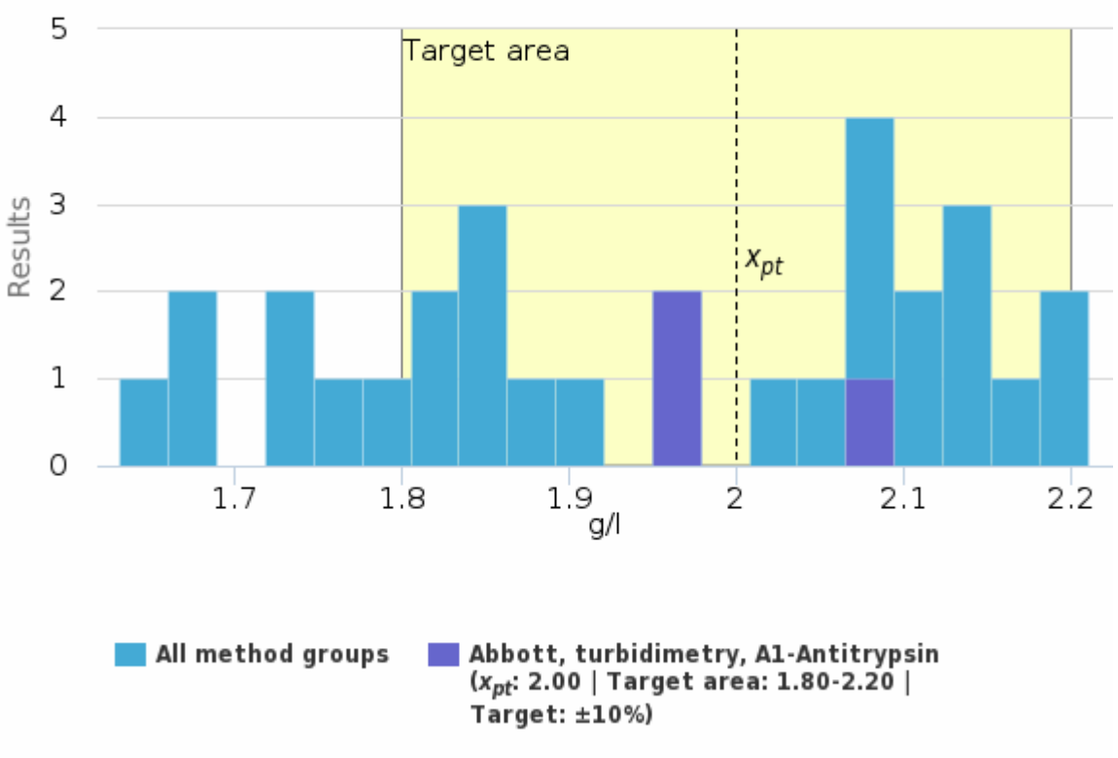


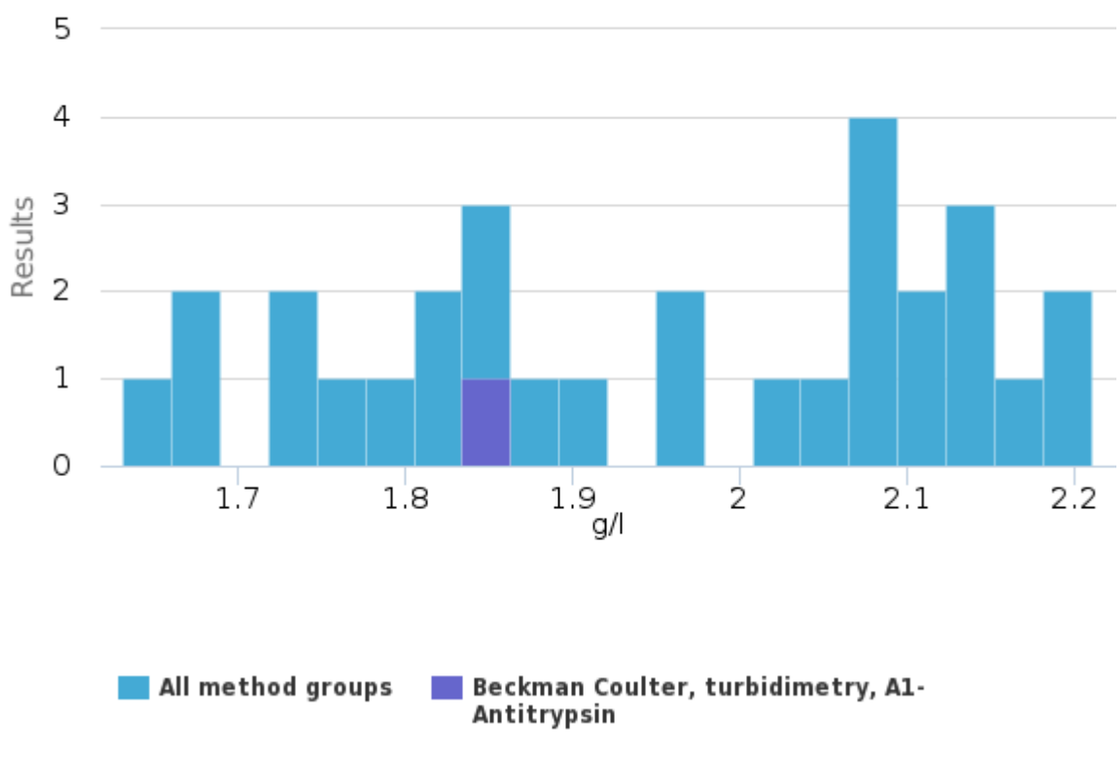


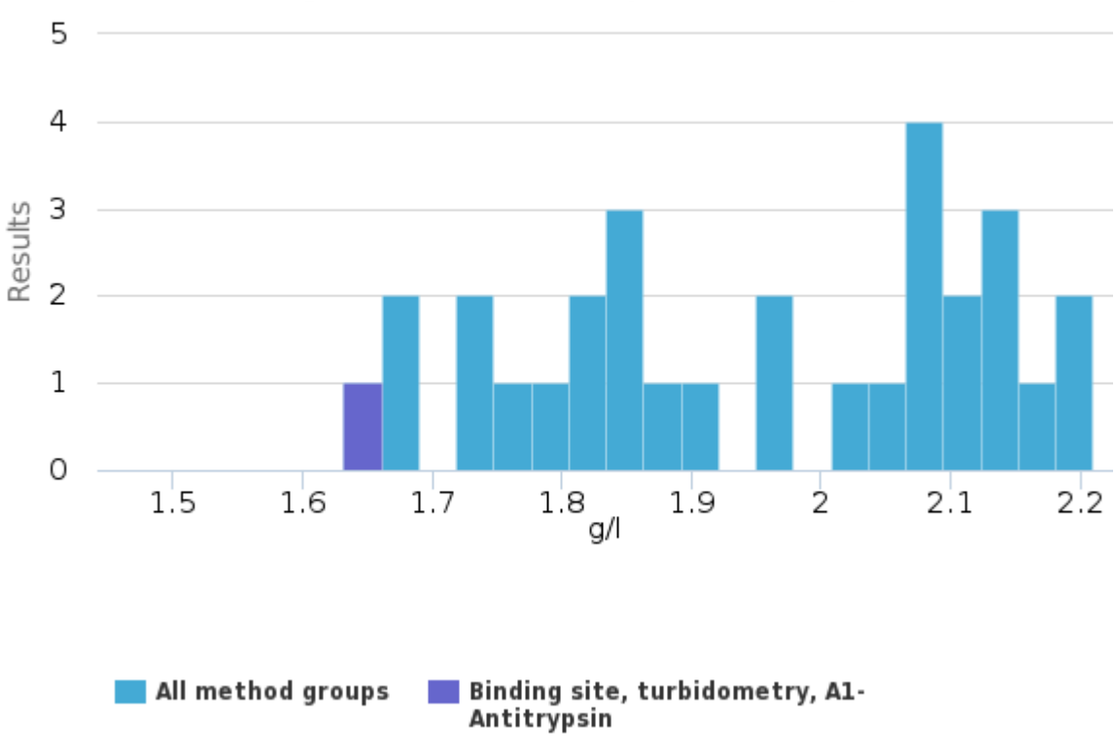
Specimen S002 | A1-Antitrypsin, g/l

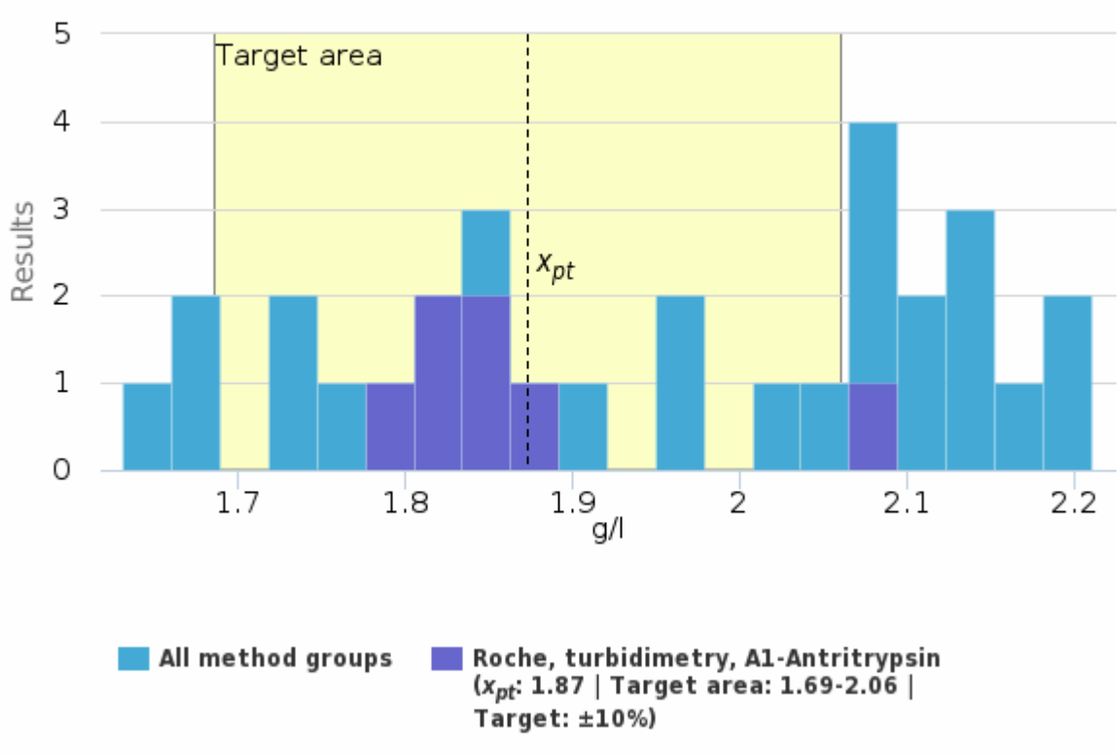
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, A1-Antitrypsin	2.00	1.96	0.08	3.9	0.05	1.95	2.09	-	3
Beckman Coulter, turbidimetry, A1-Antitrypsin	-	-	-	-	-	1.85	1.85	-	1
Binding site, turbidometry, A1-Antitrypsin	-	-	-	-	-	1.63	1.63	-	1
Roche, turbidimetry, A1-Antritrypsin	1.87	1.84	0.10	5.1	0.04	1.80	2.08	-	7
Siemens, nefelometry, A1-Antitrypsin	2.11	2.12	0.08	3.8	0.02	1.90	2.21	-	13
Siemens, turbidimetry, A1-Antitrypsin	1.72	1.72	0.04	2.4	0.02	1.67	1.77	-	5
All	**1.95**	**1.96**	**0.18**	**9.0**	**0.03**	**1.63**	**2.21**	**-**	**30**

Specimen S002 | A1-Antitrypsin, g/l| histogram summaries in LabScala



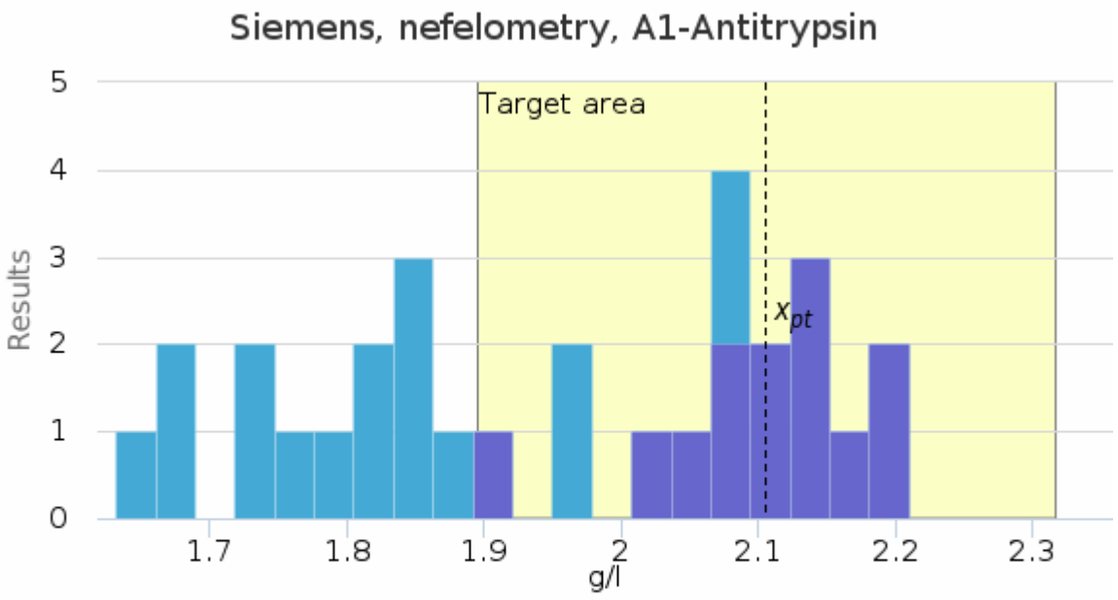


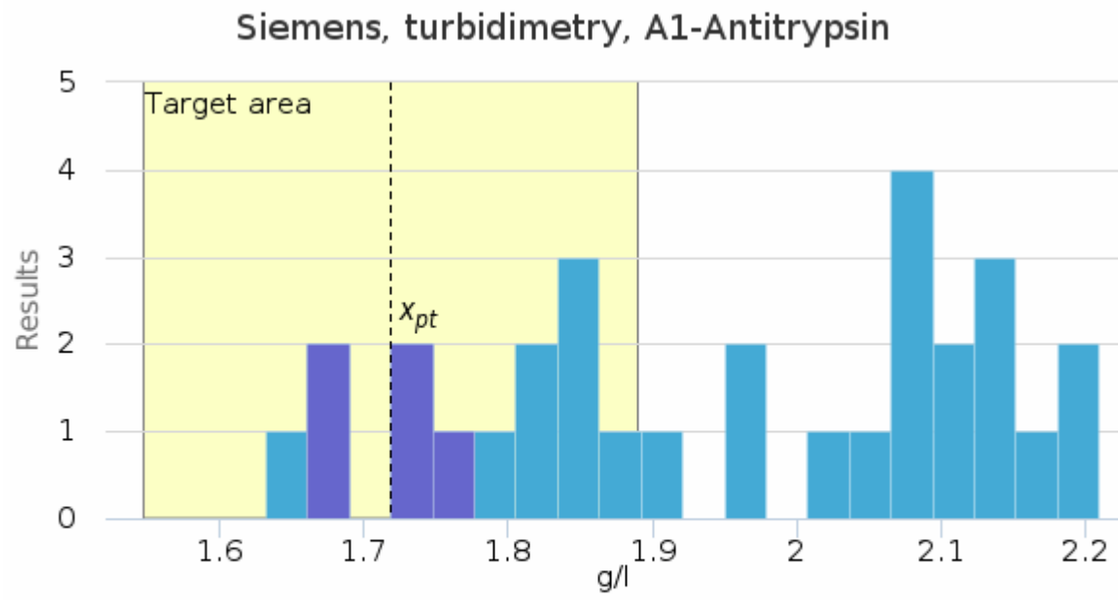




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

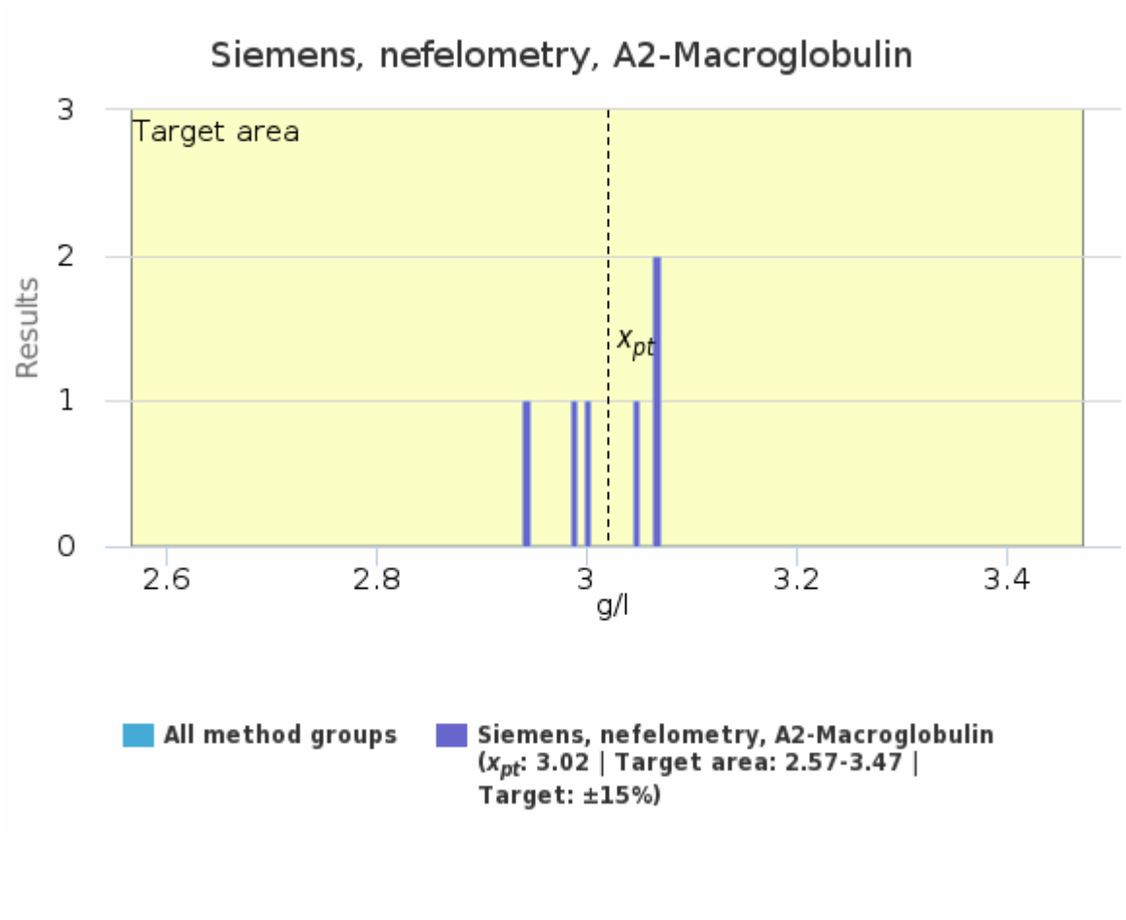




Specimen S002 | A2-Makroglobulin, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Siemens, nefelometry, A2-Macroglobulin	3.02	3.03	0.05	1.7	0.02	2.94	3.07	-	6
All	**3.02**	**3.03**	**0.05**	**1.7**	**0.02**	**2.94**	**3.07**	**-**	**6**

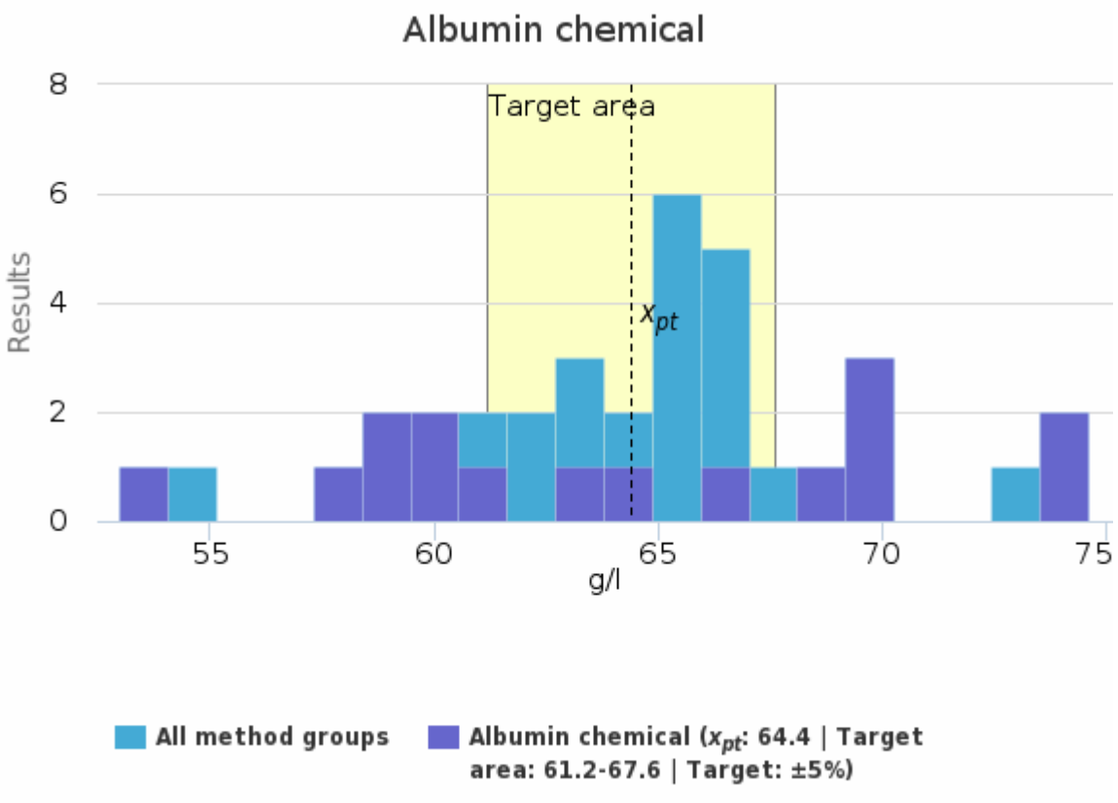
Specimen S002 | A2-Makroglobulin, g/l| histogram summaries in LabScala

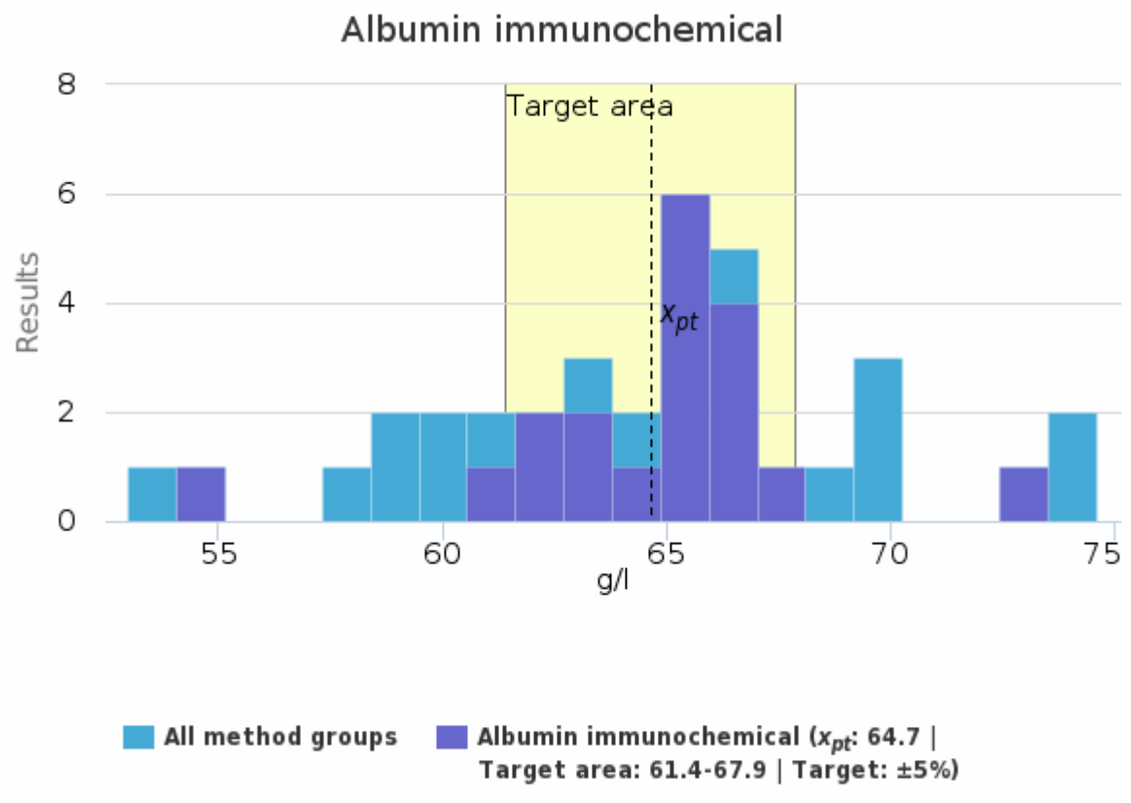


Specimen S002 | Albumin, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Albumin chemical	64.4	63.8	6.3	9.8	1.6	53.0	74.6	-	16
Albumin immunochemical	64.7	65.1	3.4	5.3	0.8	55.0	72.7	-	19
All	**64.5**	**65.0**	**4.9**	**7.5**	**0.8**	**53.0**	**74.6**	**-**	**35**

Specimen S002 | Albumin, g/l| histogram summaries in LabScala

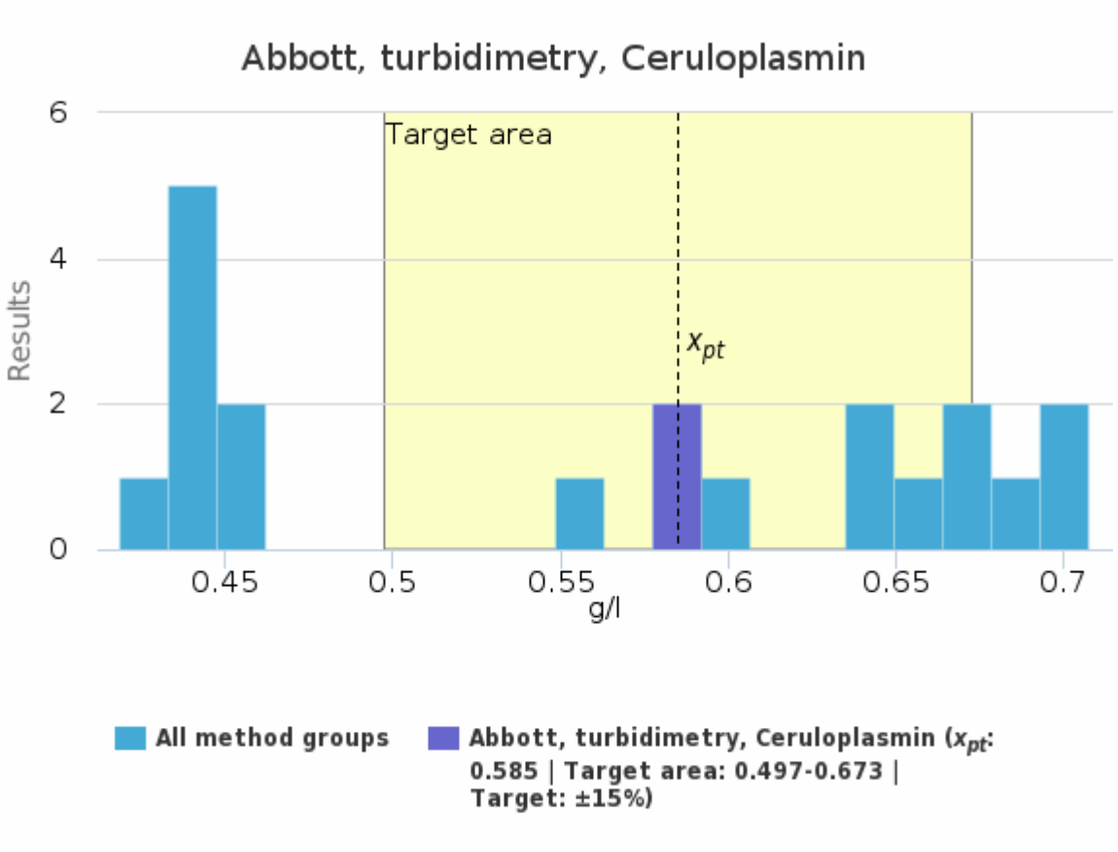


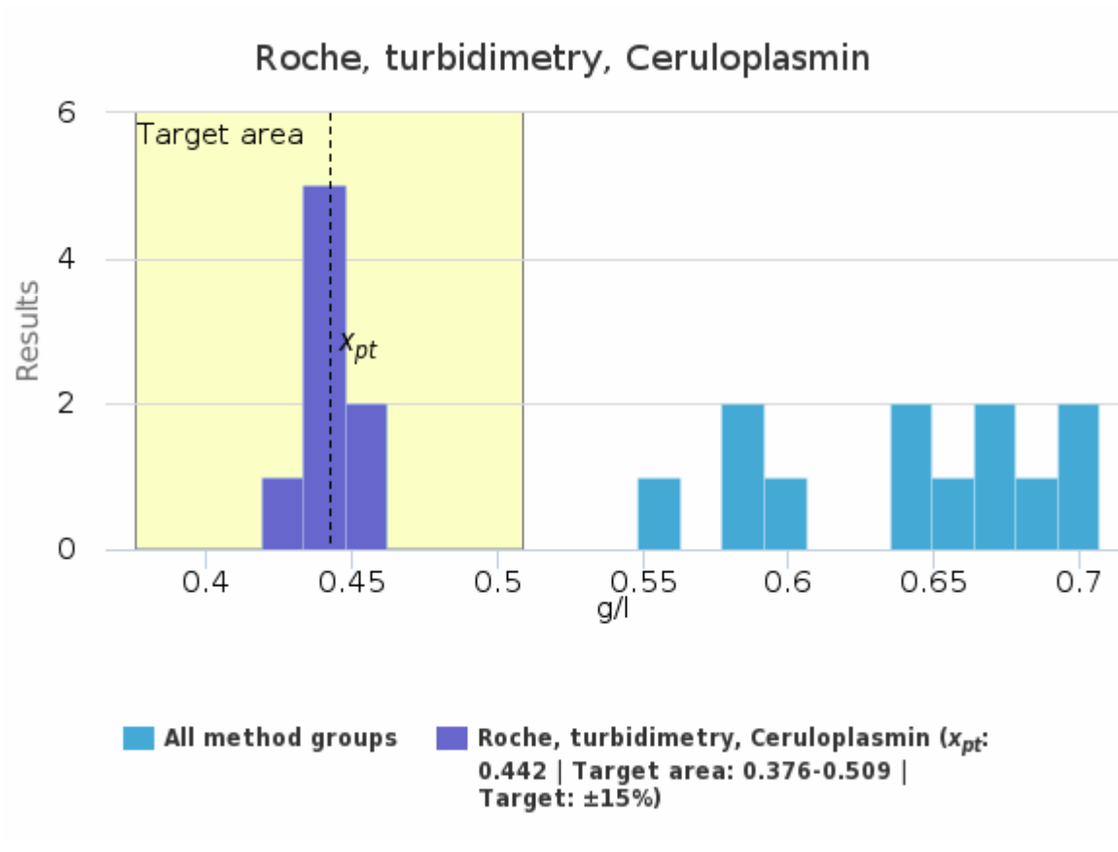


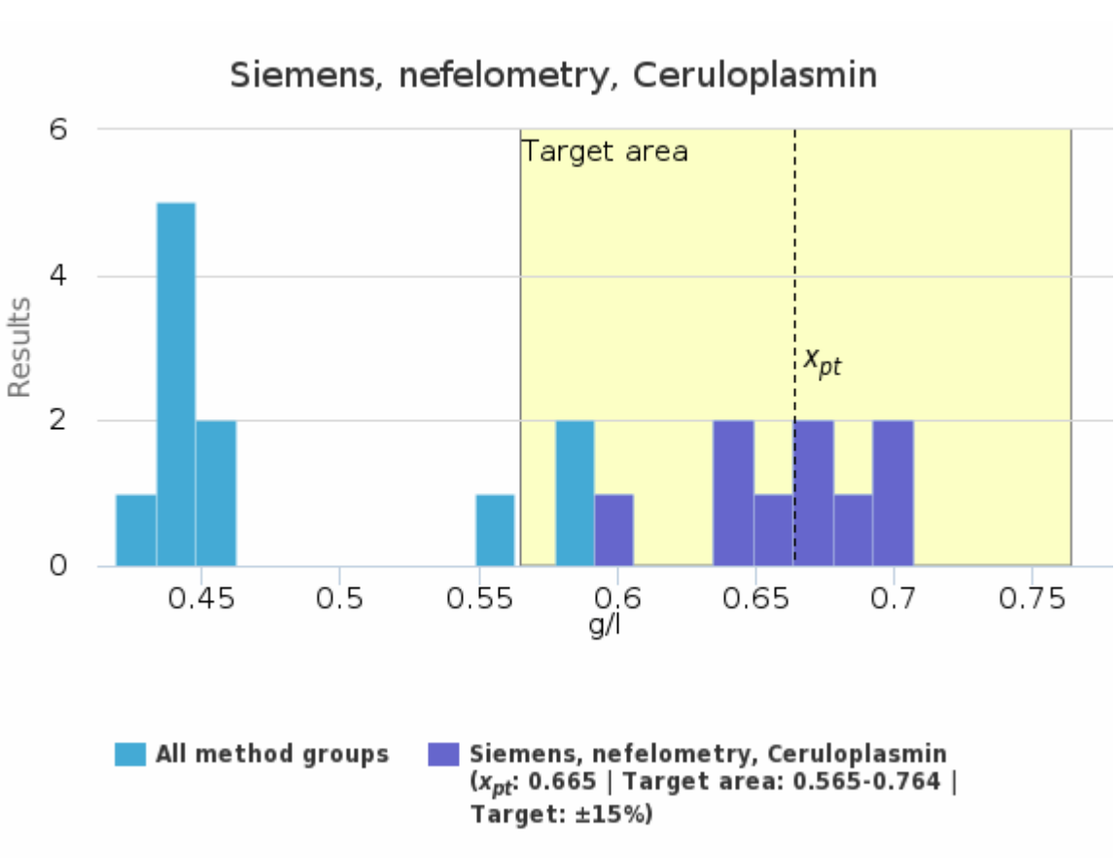
Specimen S002 | Ceruloplasmin, g/l

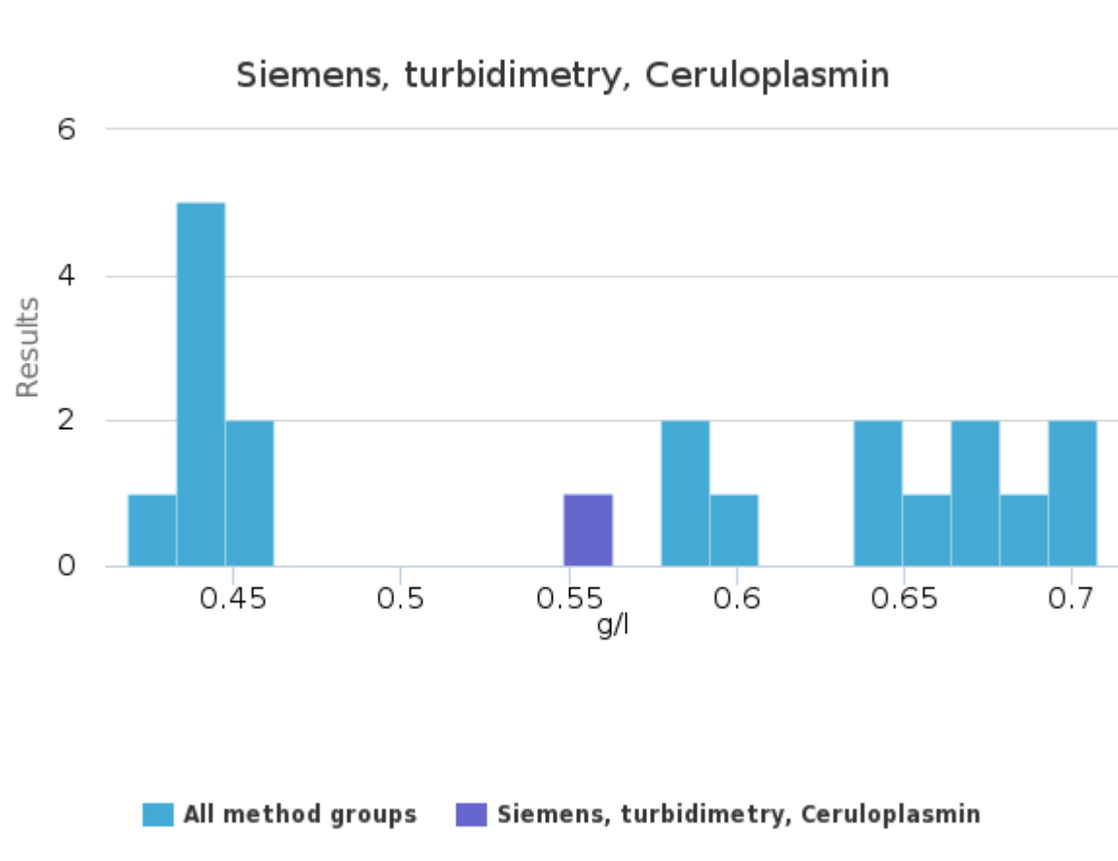
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Ceruloplasmin	0.585	0.585	0.007	1.2	0.005	0.580	0.590	-	2
Roche, turbidimetry, Ceruloplasmin	0.442	0.443	0.012	2.7	0.004	0.419	0.460	-	8
Siemens, nefelometry, Ceruloplasmin	0.665	0.666	0.033	4.9	0.011	0.600	0.707	-	9
Siemens, turbidimetry, Ceruloplasmin	-	-	-	-	-	0.560	0.560	-	1
All	**0.562**	**0.585**	**0.108**	**19.1**	**0.024**	**0.419**	**0.707**	**-**	**20**

Specimen S002 | Ceruloplasmin, g/l| histogram summaries in LabScala





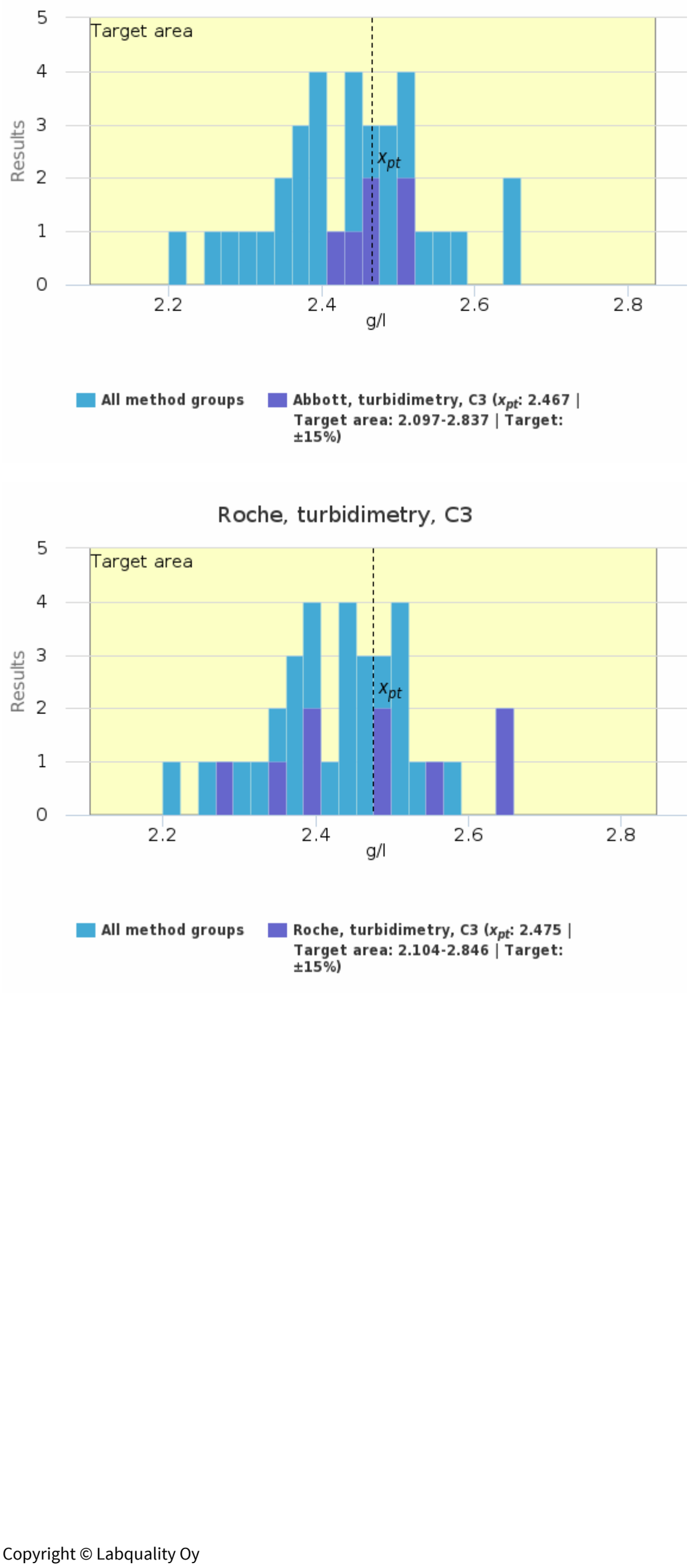


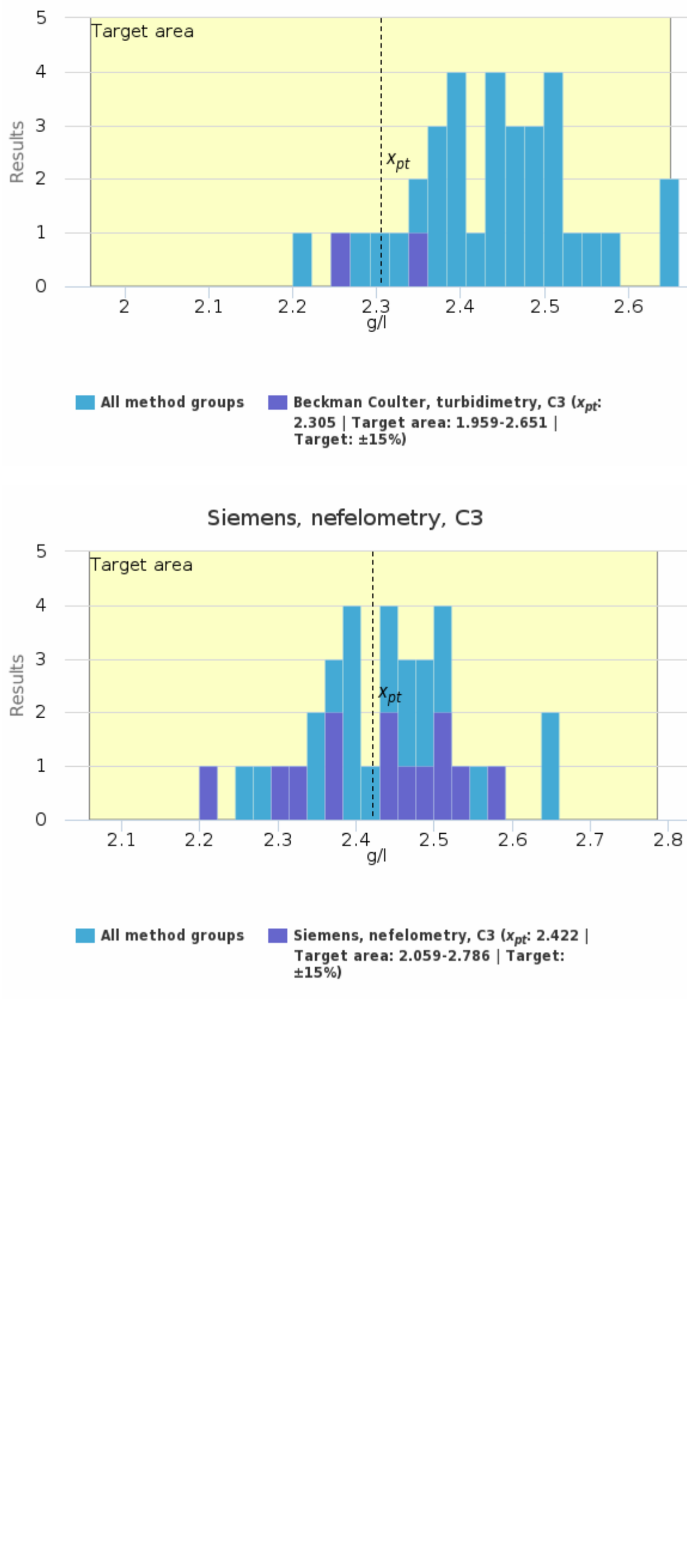


Specimen S002 | Complement C3, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, C3	2.467	2.470	0.041	1.7	0.017	2.410	2.520	-	6
Beckman Coulter, turbidimetry, C3	2.305	2.305	0.078	3.4	0.055	2.250	2.360	-	2
Roche, turbidimetry, C3	2.475	2.480	0.127	5.1	0.042	2.290	2.660	-	9
Siemens, nefelometry, C3	2.422	2.430	0.104	4.3	0.029	2.200	2.570	-	13
Siemens, turbidimetry, C3	2.407	2.390	0.038	1.6	0.022	2.380	2.450	-	3
Thermo Scientific, turbidimetry, C3	-	-	-	-	-	2.400	2.400	-	1
All	**2.435**	**2.430**	**0.101**	**4.1**	**0.017**	**2.200**	**2.660**	**-**	**34**

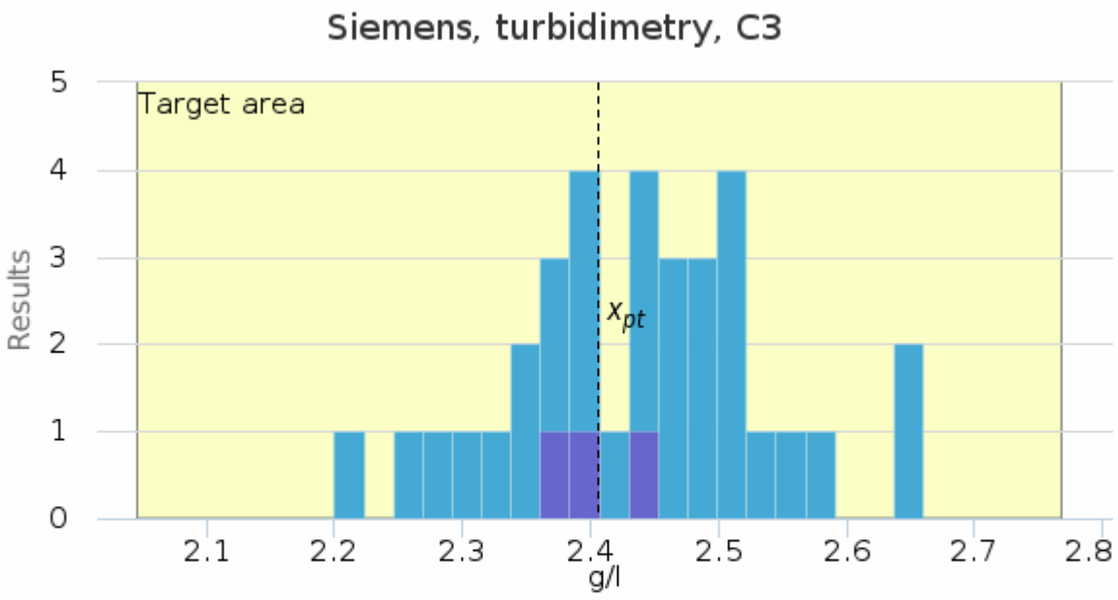
Specimen S002 | Complement C3, g/l| histogram summaries in LabScala

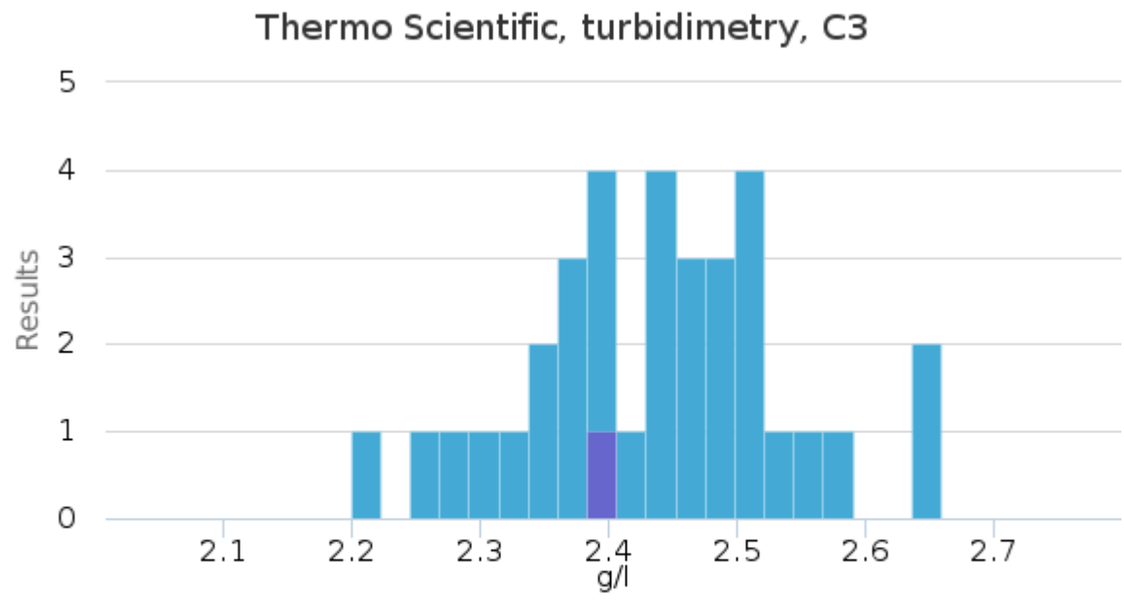




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

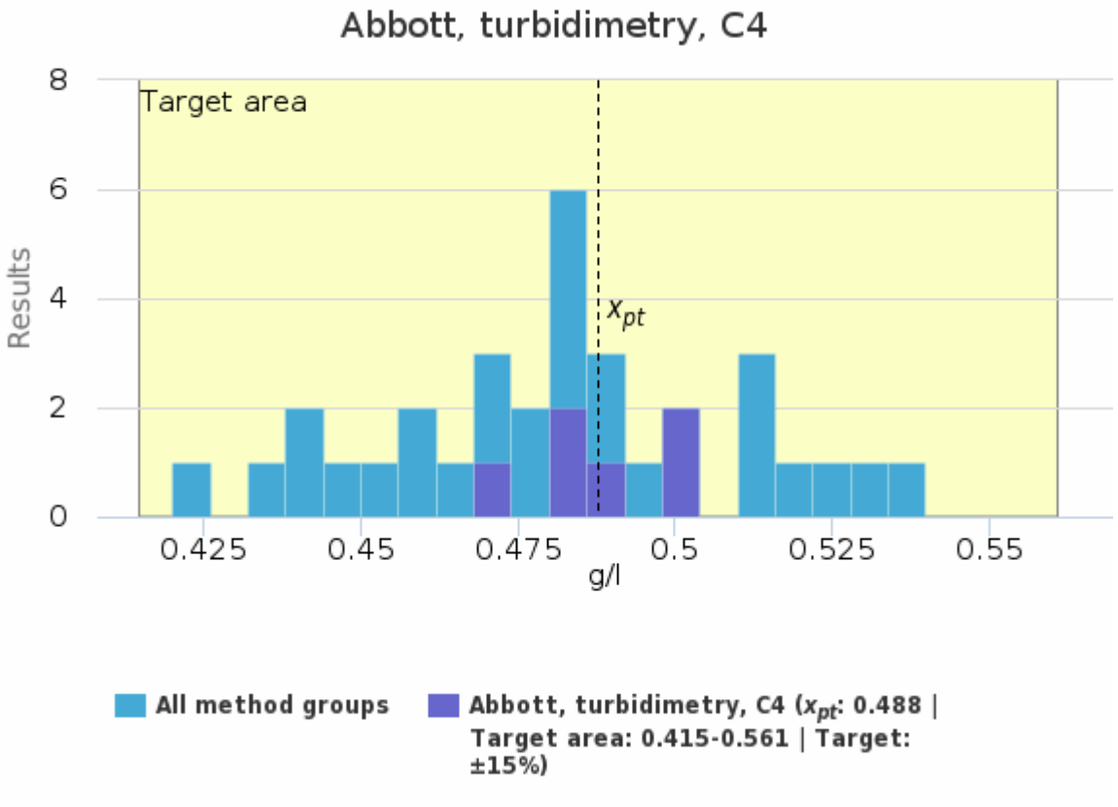


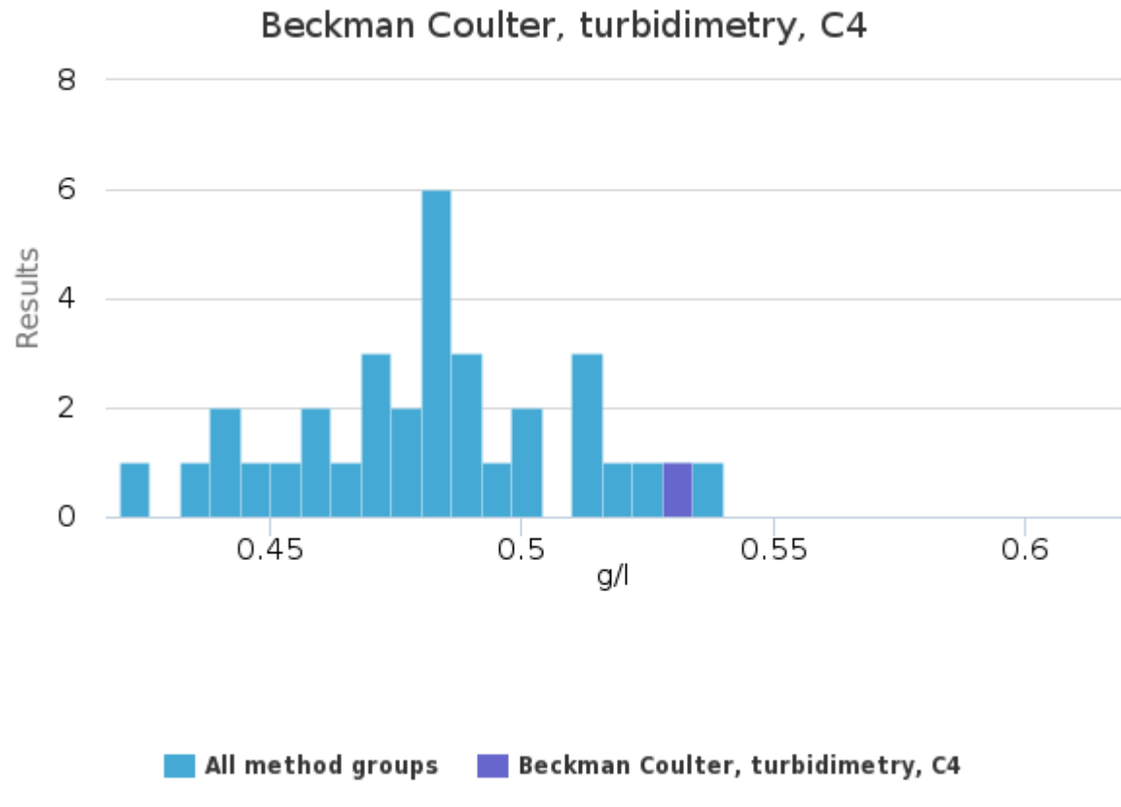


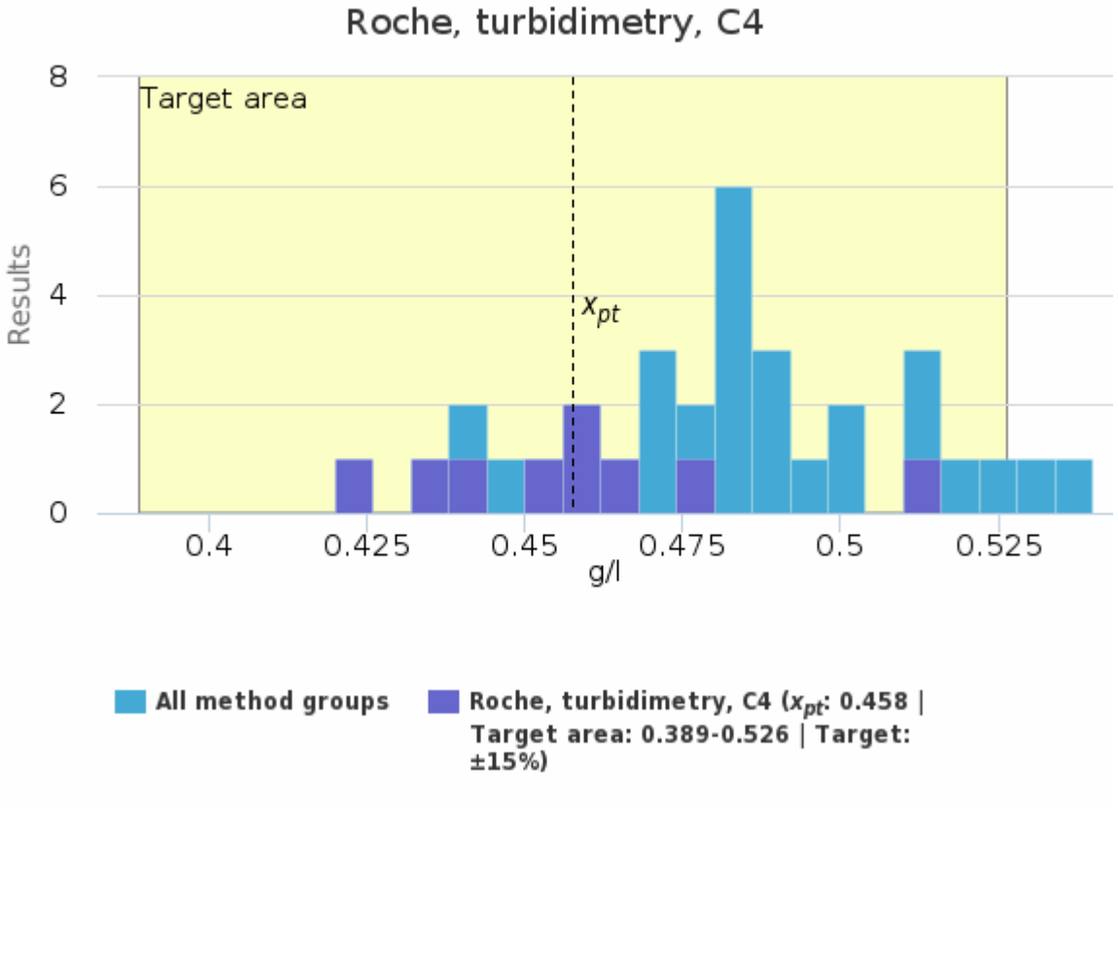
Specimen S002 | Complement C4, g/l

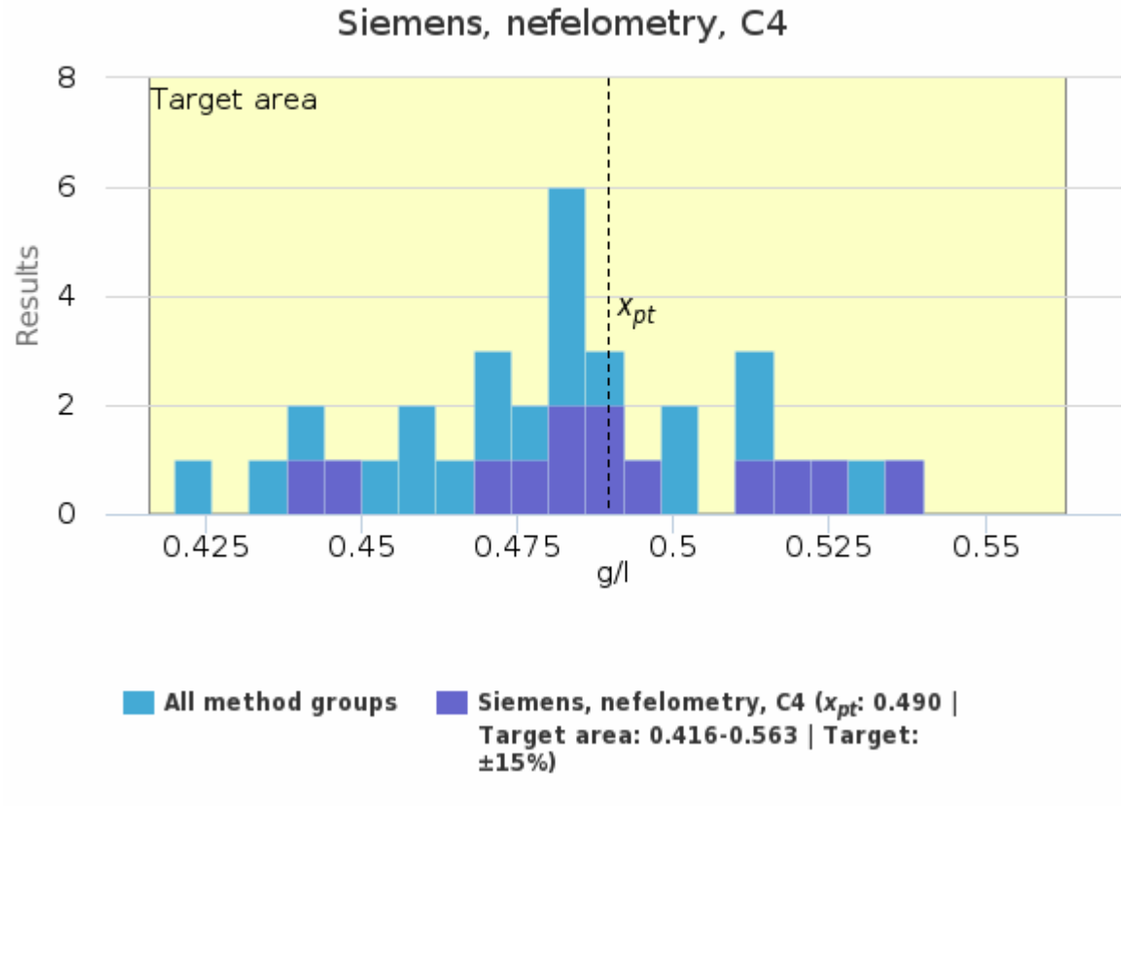
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, C4	0.488	0.487	0.012	2.4	0.005	0.470	0.500	-	6
Beckman Coulter, turbidimetry, C4	-	-	-	-	-	0.530	0.530	-	1
Roche, turbidimetry, C4	0.458	0.460	0.026	5.6	0.009	0.420	0.510	-	9
Siemens, nefelometry, C4	0.490	0.490	0.029	6.0	0.008	0.440	0.540	-	13
Siemens, turbidimetry, C4	0.477	0.480	0.006	1.2	0.003	0.470	0.480	-	3
Thermo Scientific, turbidimetry, C4	-	-	-	-	-	0.510	0.510	-	1
All	**0.481**	**0.480**	**0.028**	**5.9**	**0.005**	**0.420**	**0.540**	**-**	**33**

Specimen S002 | Complement C4, g/l| histogram summaries in LabScala



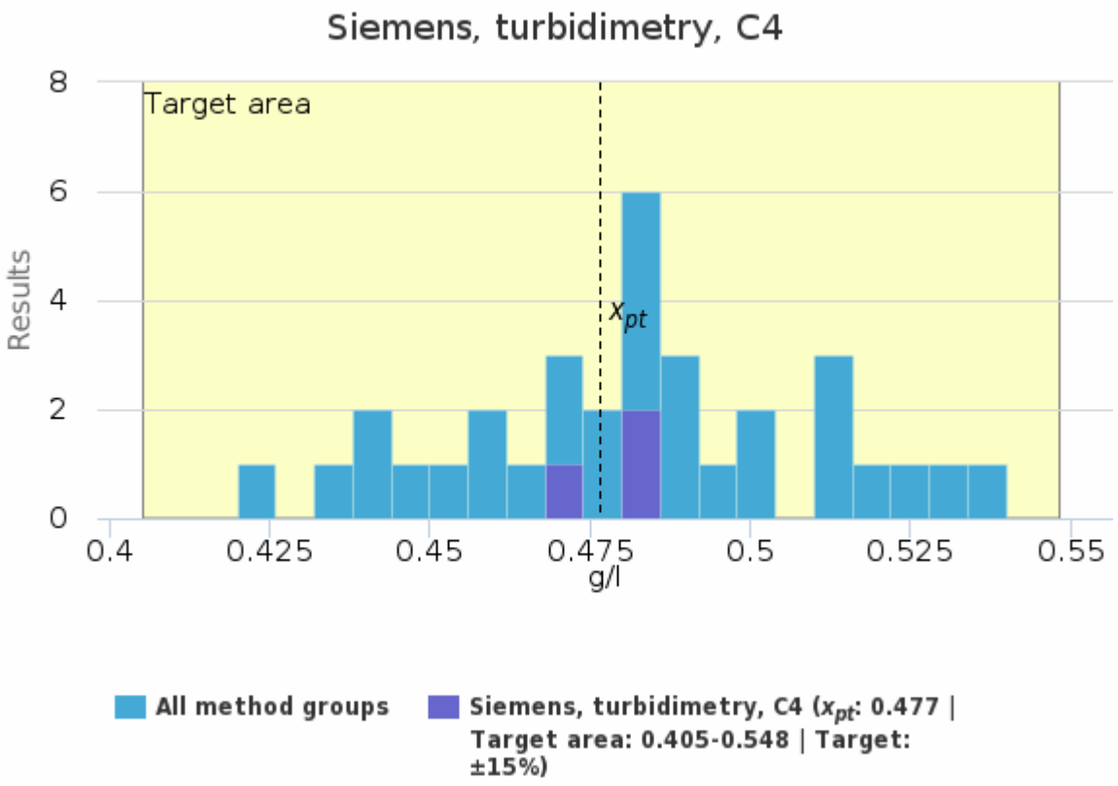


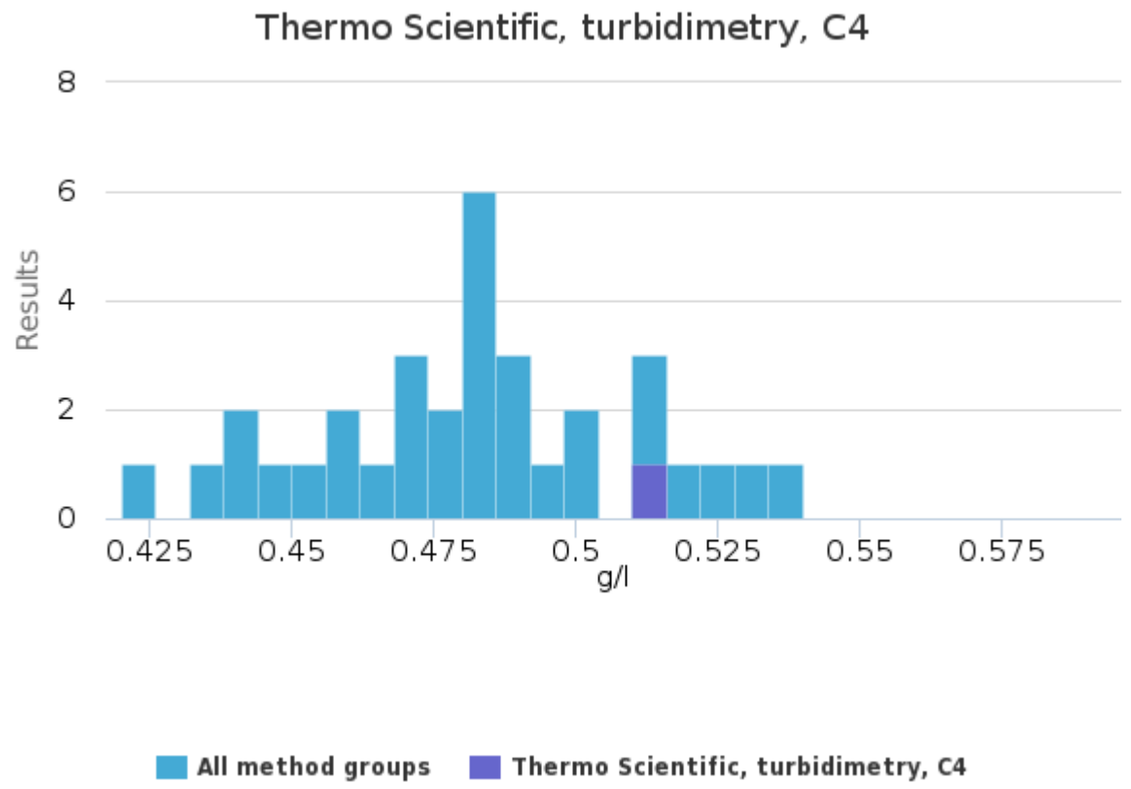




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

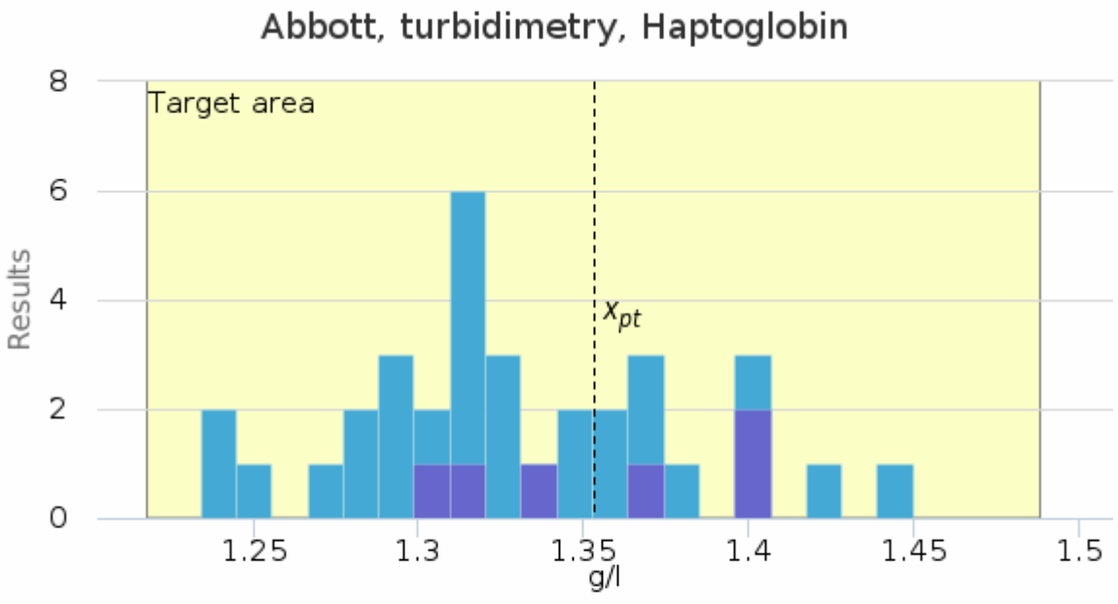


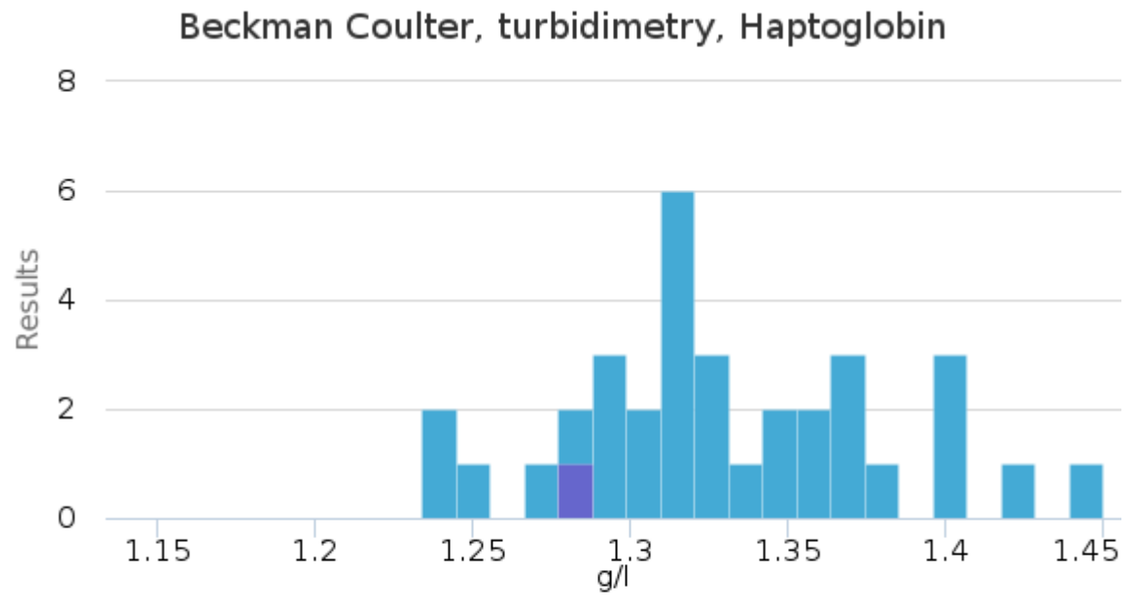


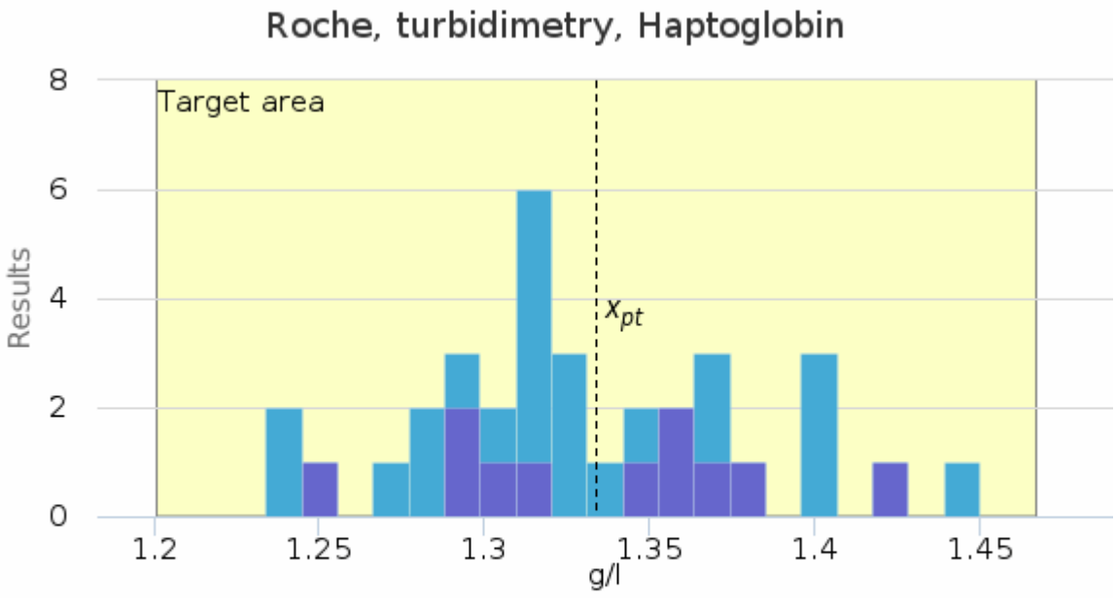
Specimen S002 | Haptoglobin, g/l

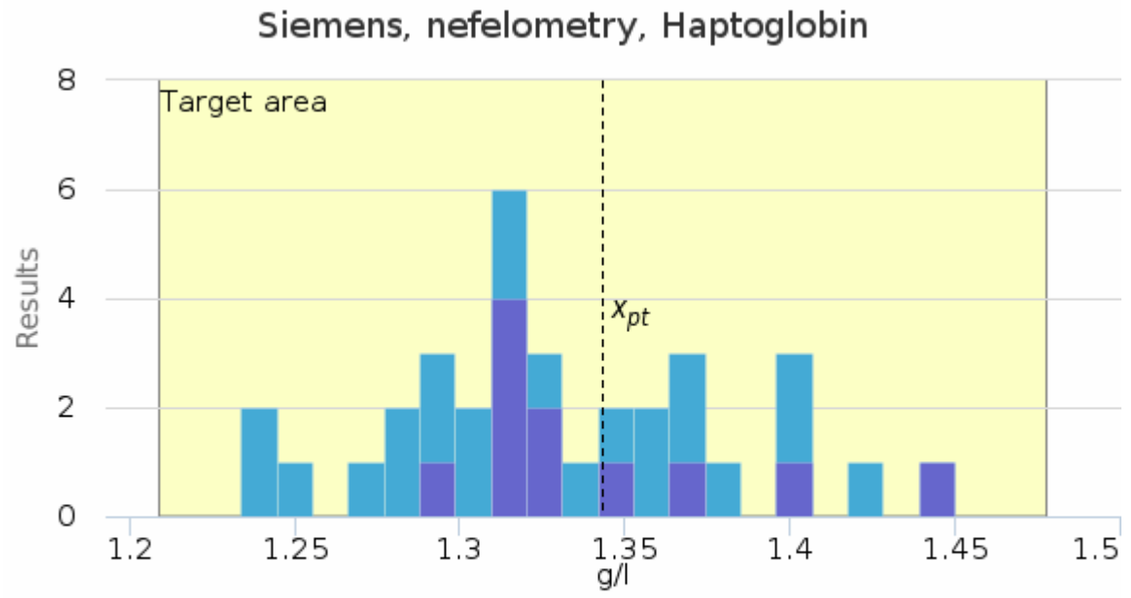
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Haptoglobin	1.35	1.35	0.04	3.2	0.02	1.30	1.40	-	6
Beckman Coulter, turbidimetry, Haptoglobin	-	-	-	-	-	1.28	1.28	-	1
Roche, turbidimetry, Haptoglobin	1.33	1.35	0.05	3.7	0.02	1.25	1.42	-	11
Siemens, nefelometry, Haptoglobin	1.34	1.33	0.05	3.5	0.01	1.29	1.45	-	11
Siemens, turbidimetry, Haptoglobin	1.27	1.27	0.04	2.8	0.02	1.23	1.32	-	5
All	**1.33**	**1.32**	**0.05**	**3.9**	**<0.01**	**1.23**	**1.45**	**-**	**34**

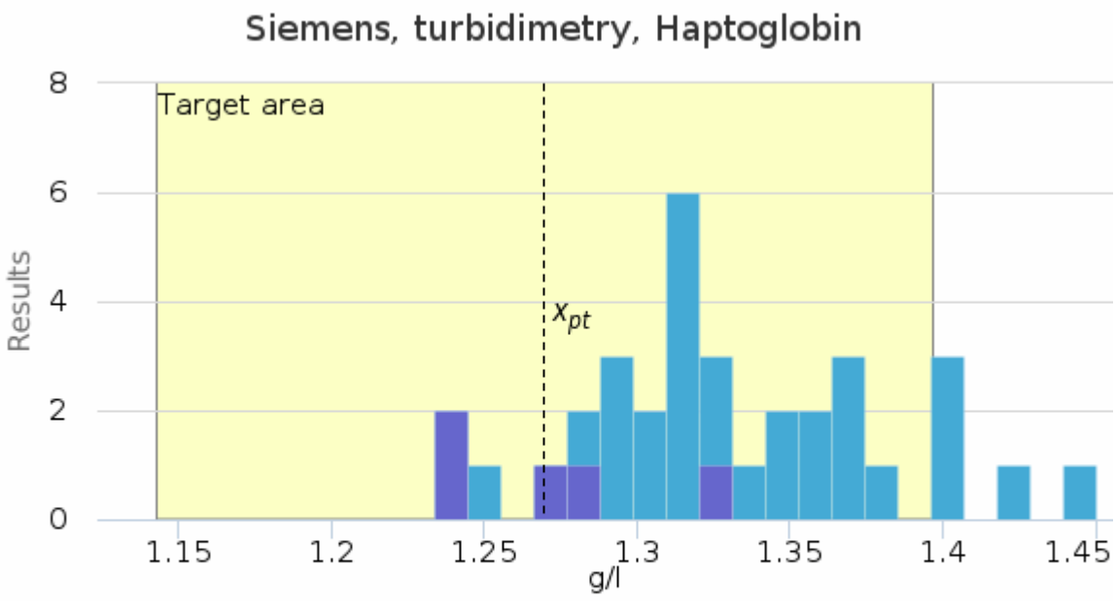
Specimen S002 | Haptoglobin, g/l| histogram summaries in LabScala







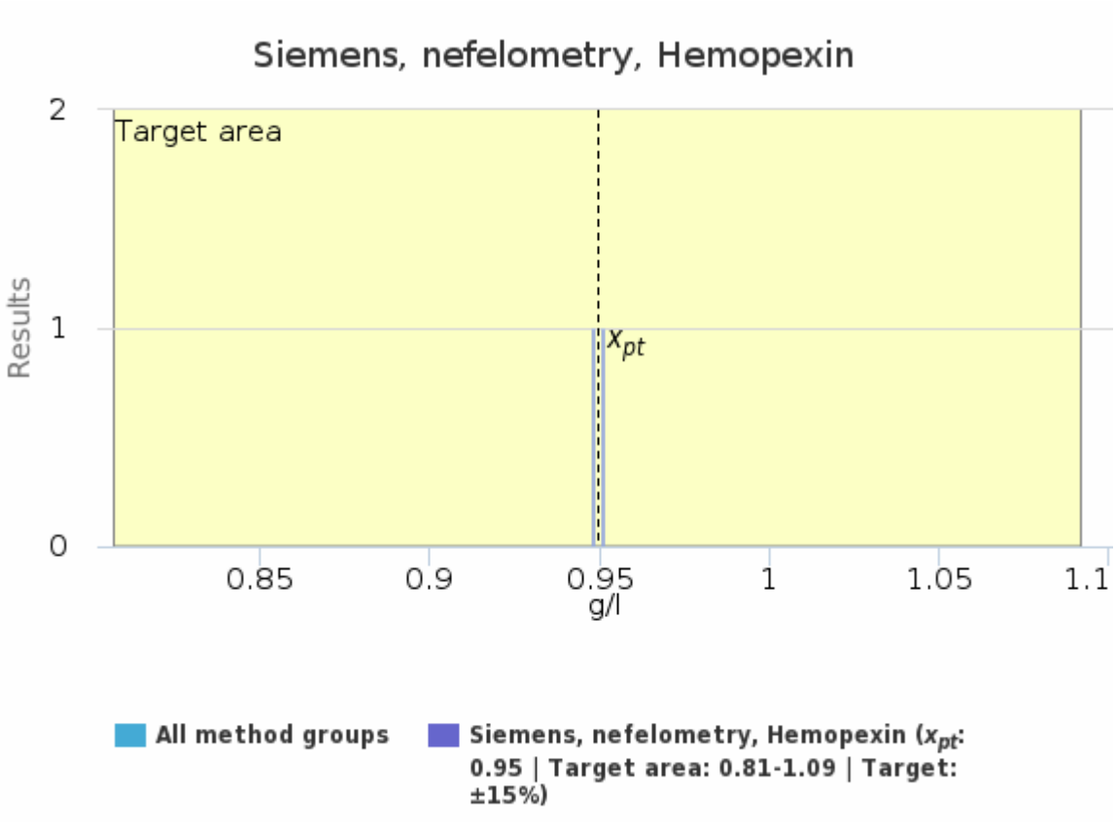




Specimen S002 | Hemopexin, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Siemens, nefelometry, Hemopexin	0.95	0.95	<0.01	0.2	<0.01	0.95	0.95	-	2
All	**0.95**	**0.95**	**<0.01**	**0.2**	**<0.01**	**0.95**	**0.95**	**-**	**2**

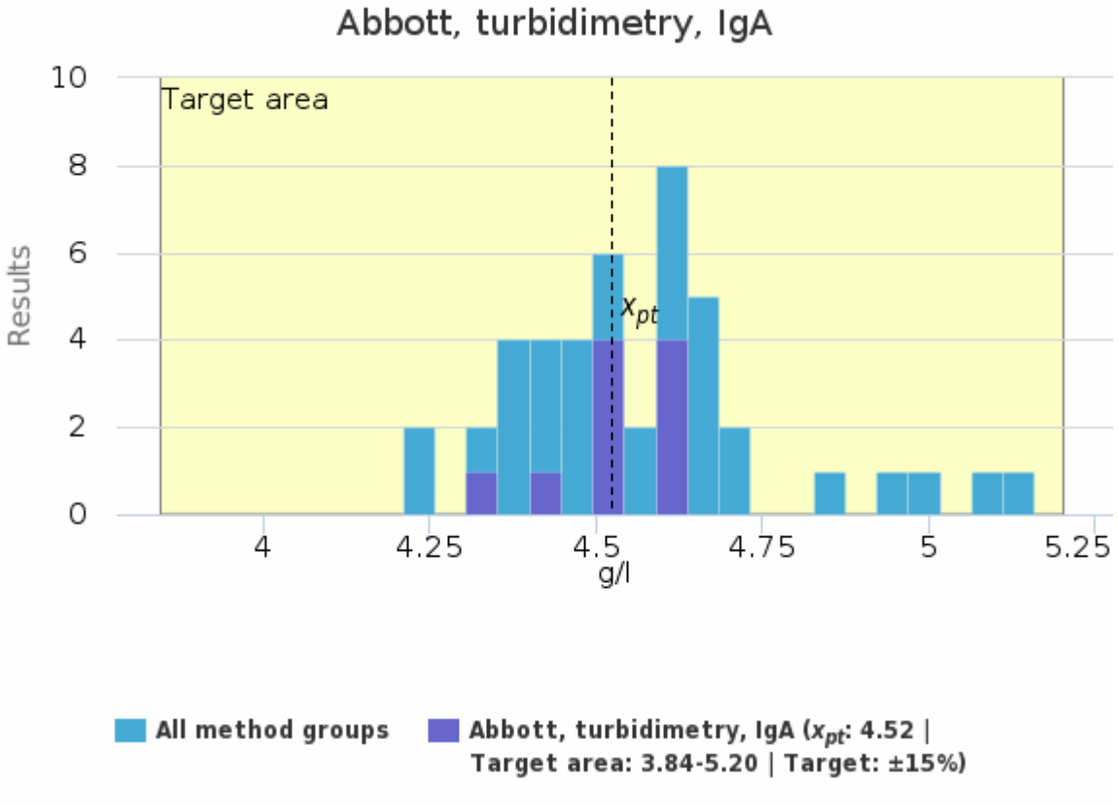
Specimen S002 | Hemopexin, g/l| histogram summaries in LabScala

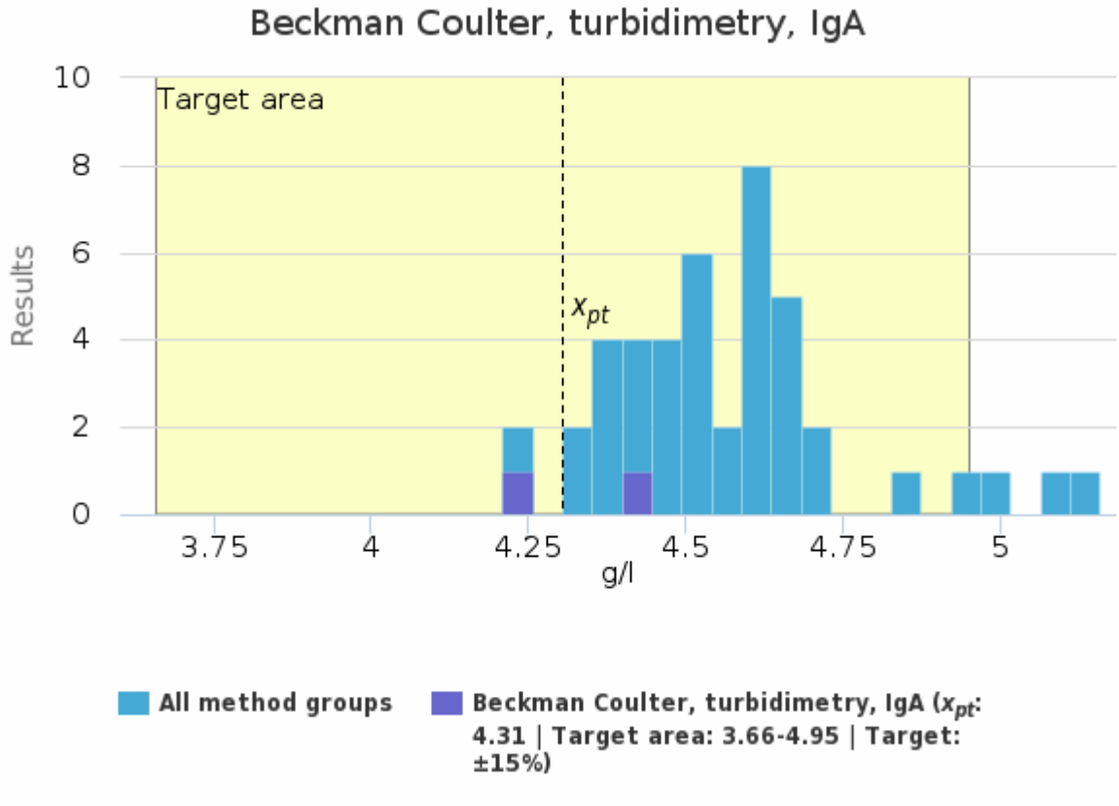


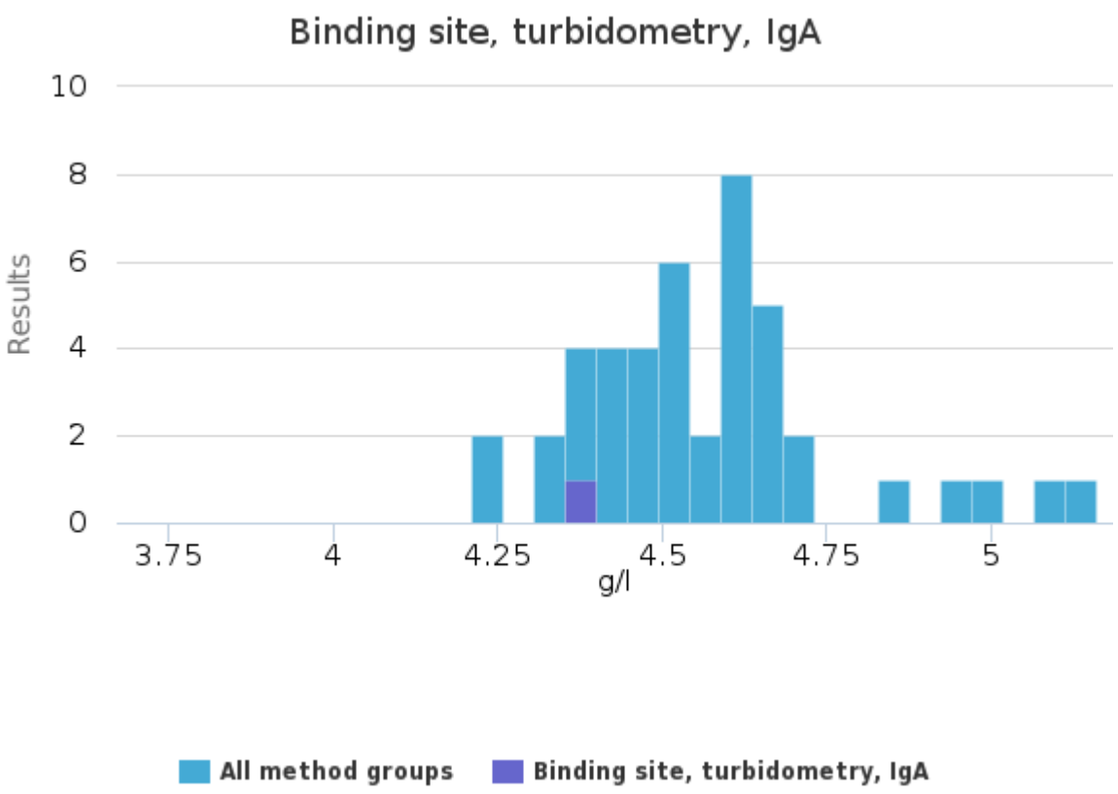
Specimen S002 | IgA, g/l

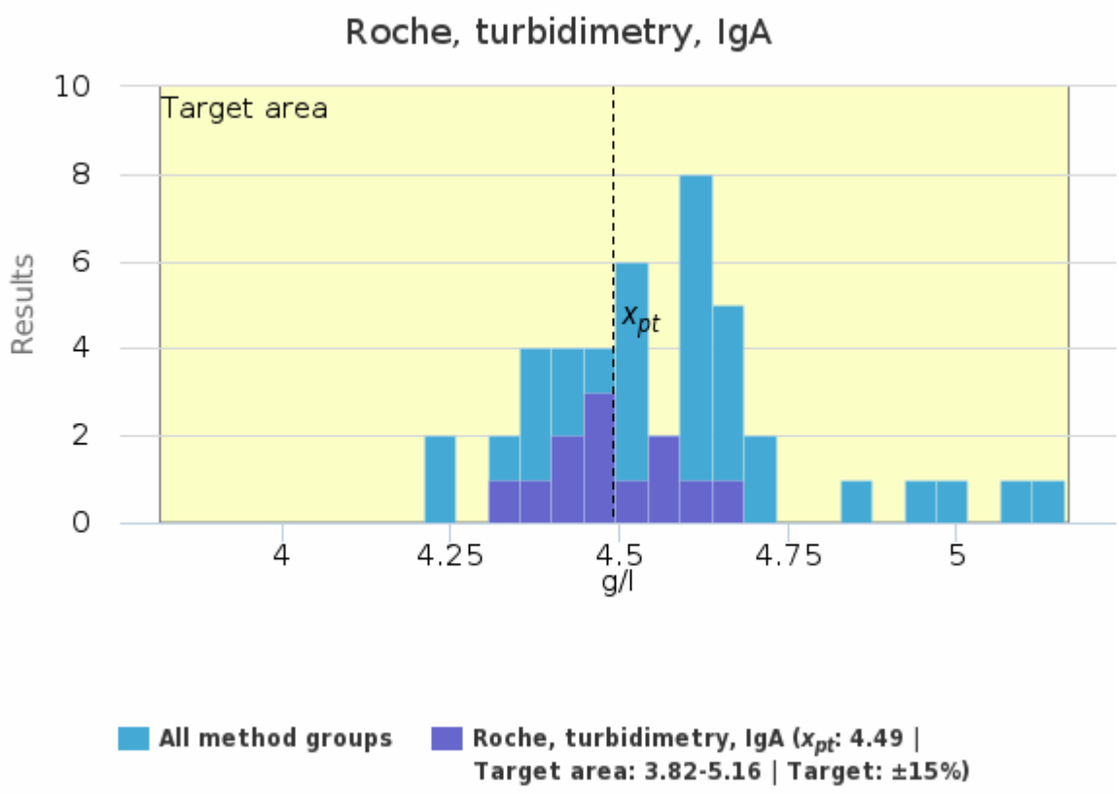
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, IgA	4.52	4.53	0.09	2.0	0.03	4.32	4.61	-	10
Beckman Coulter, turbidimetry, IgA	4.31	4.31	0.13	3.1	0.10	4.21	4.40	-	2
Binding site, turbidometry, IgA	-	-	-	-	-	4.39	4.39	-	1
Roche, turbidimetry, IgA	4.49	4.49	0.10	2.3	0.03	4.33	4.67	-	12
Siemens, nefelometry, IgA	4.70	4.64	0.26	5.5	0.07	4.22	5.16	-	15
Siemens, turbidimetry, IgA	4.60	4.69	0.18	3.9	0.10	4.39	4.71	-	3
Thermo Scientific, turbidimetry, IgA	-	-	-	-	-	4.54	4.54	-	1
All	**4.55**	**4.54**	**0.18**	**4.0**	**0.03**	**4.21**	**5.07**	**1**	**44**

Specimen S002 | IgA, g/l| histogram summaries in LabScala



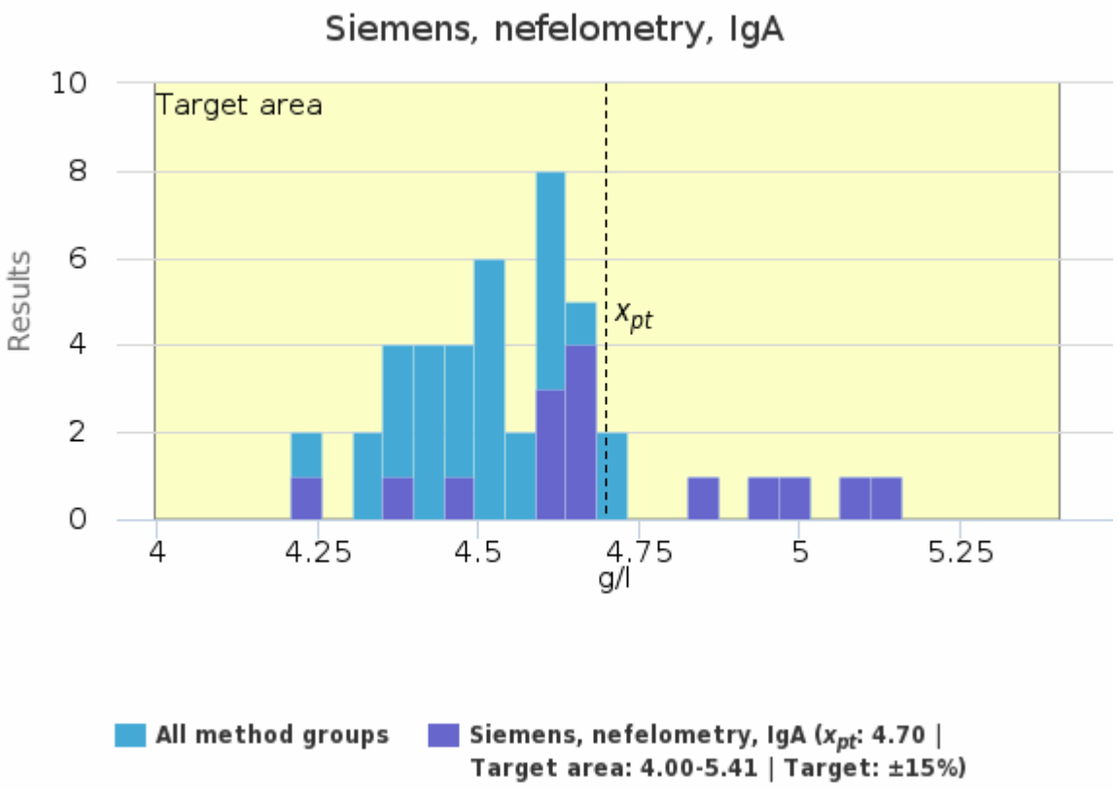


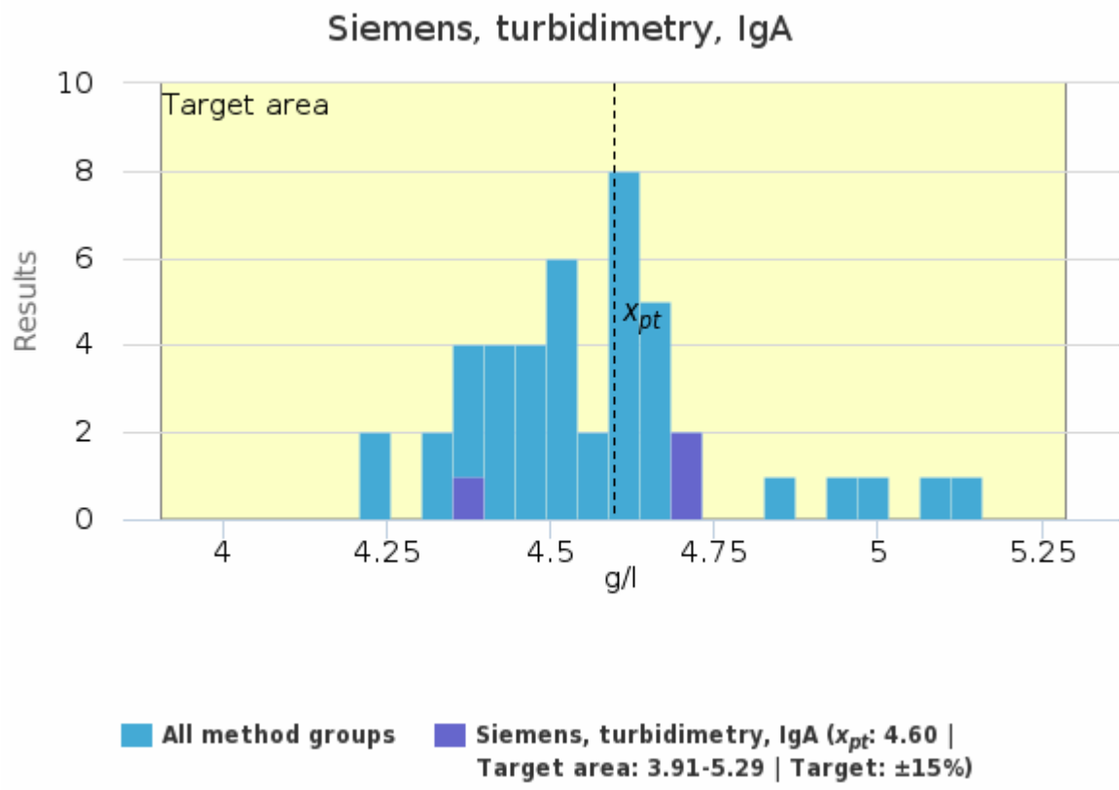


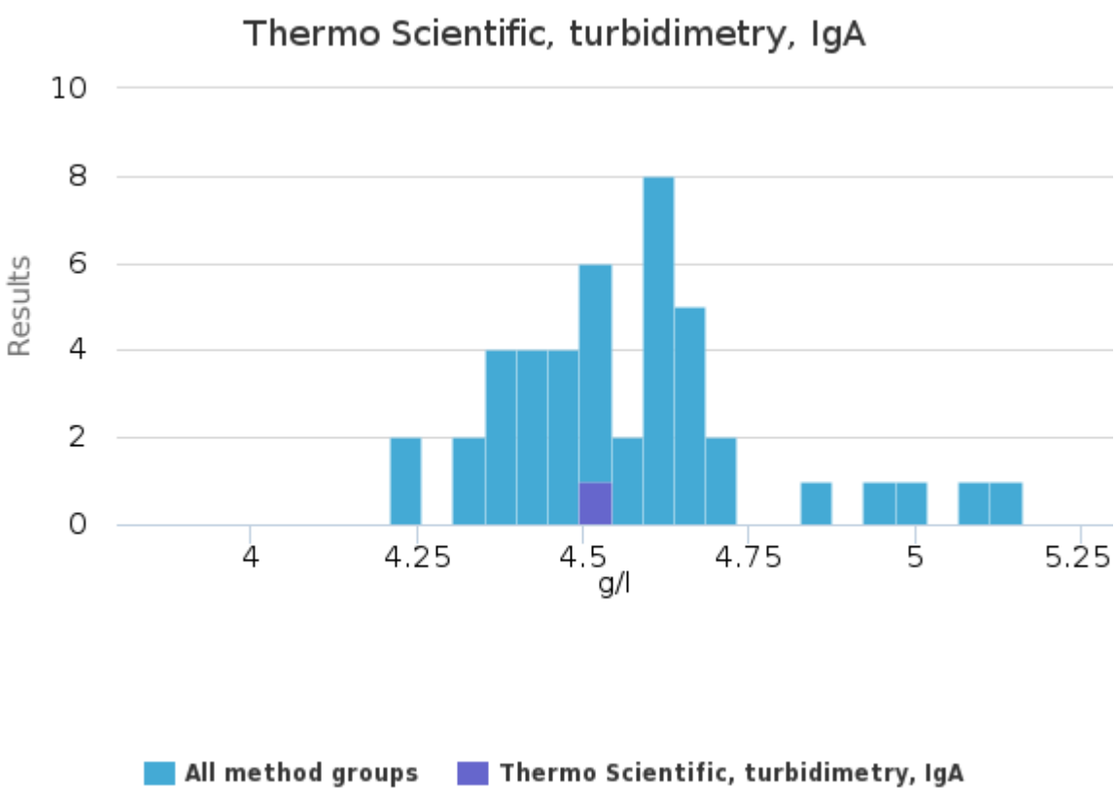


Proteins, immunochemical determinations, January, 1-2023

Quantitative report



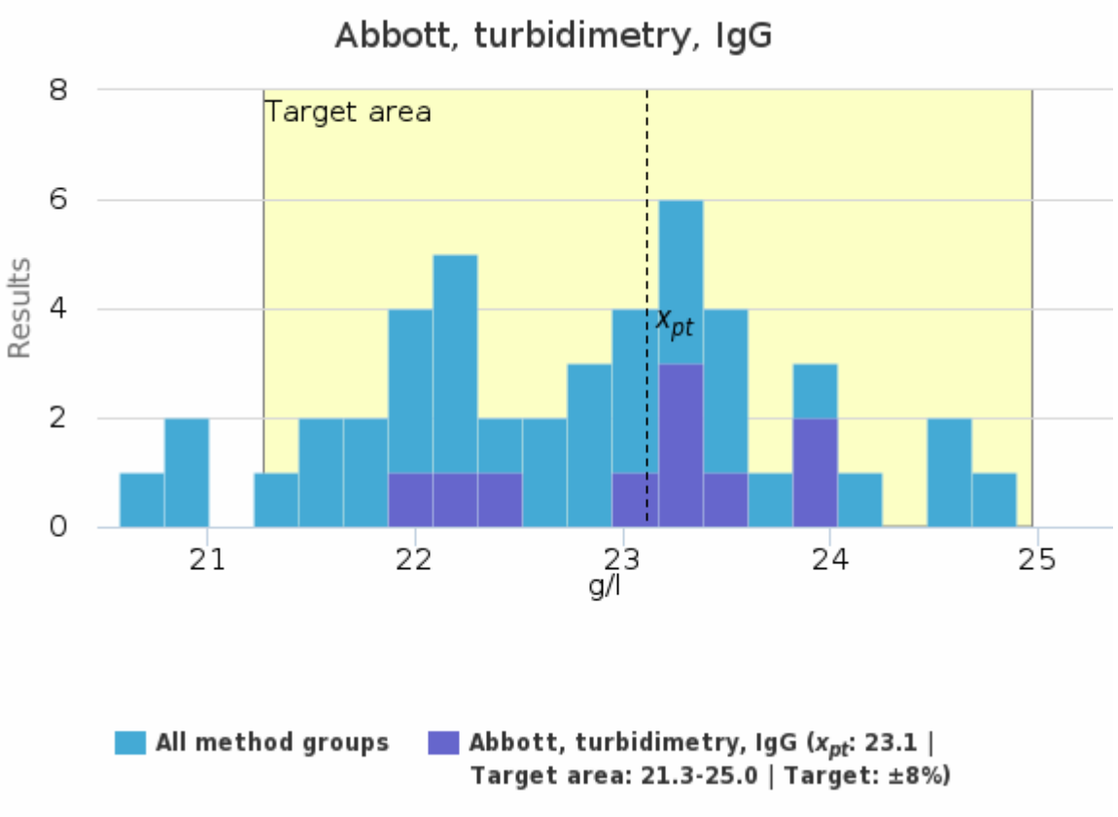


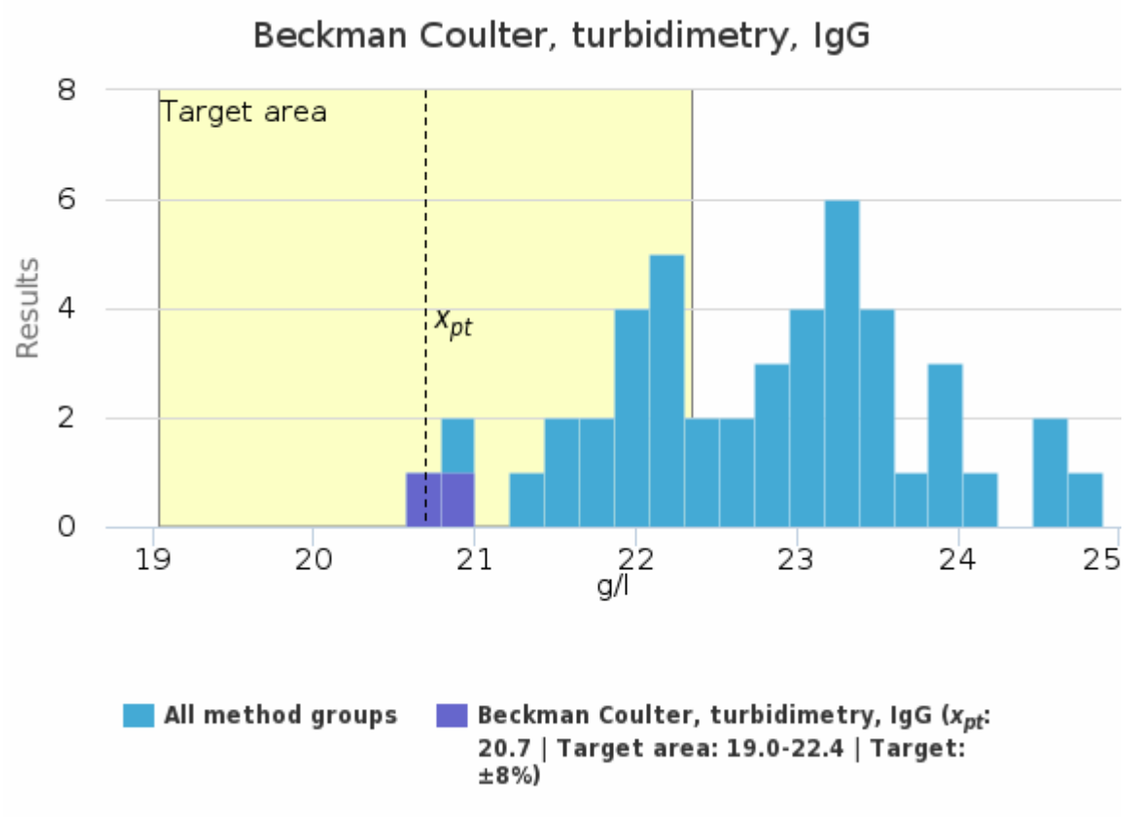


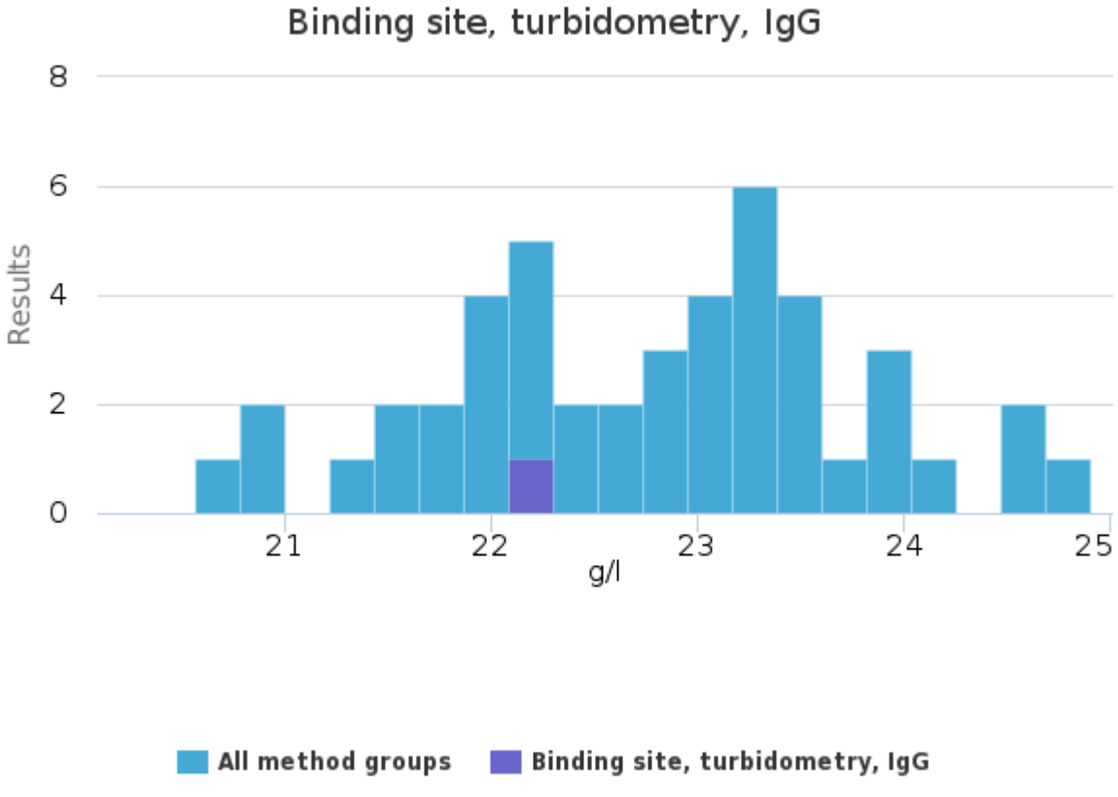
Specimen S002 | IgG, g/l

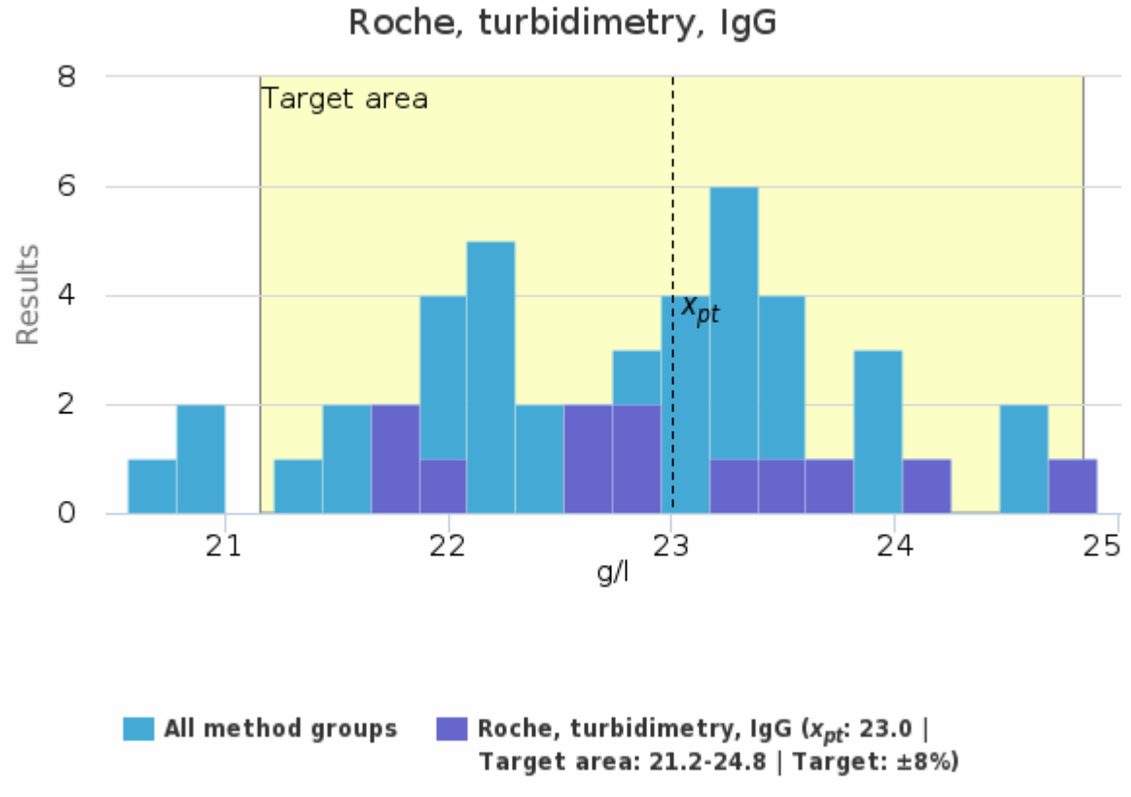
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, IgG	23.1	23.3	0.7	2.9	0.2	22.0	24.0	-	10
Beckman Coulter, turbidimetry, IgG	20.7	20.7	0.2	0.9	0.1	20.6	20.8	-	2
Binding site, turbidometry, IgG	-	-	-	-	-	22.1	22.1	-	1
Roche, turbidimetry, IgG	23.0	22.9	1.0	4.1	0.3	21.8	24.9	-	12
Siemens, nefelometry, IgG	22.6	22.4	1.1	4.8	0.3	20.9	24.6	-	18
Siemens, turbidimetry, IgG	23.1	23.1	0.1	0.6	<0.1	23.0	23.3	-	3
All	**22.8**	**22.9**	**1.0**	**4.4**	**0.1**	**20.6**	**24.9**	**-**	**46**

Specimen S002 | IgG, g/l| histogram summaries in LabScala



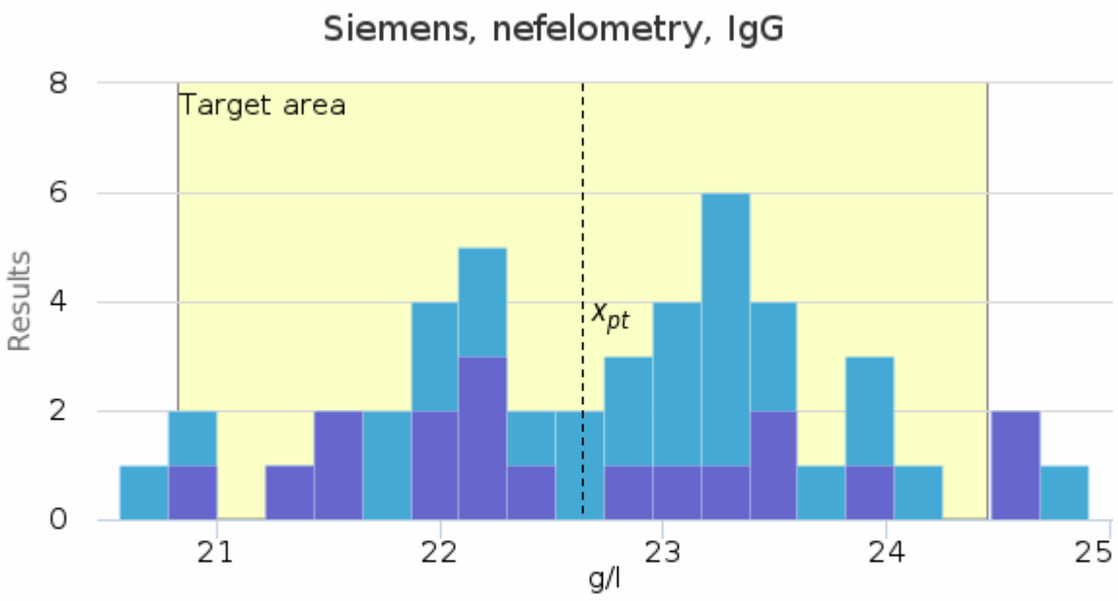


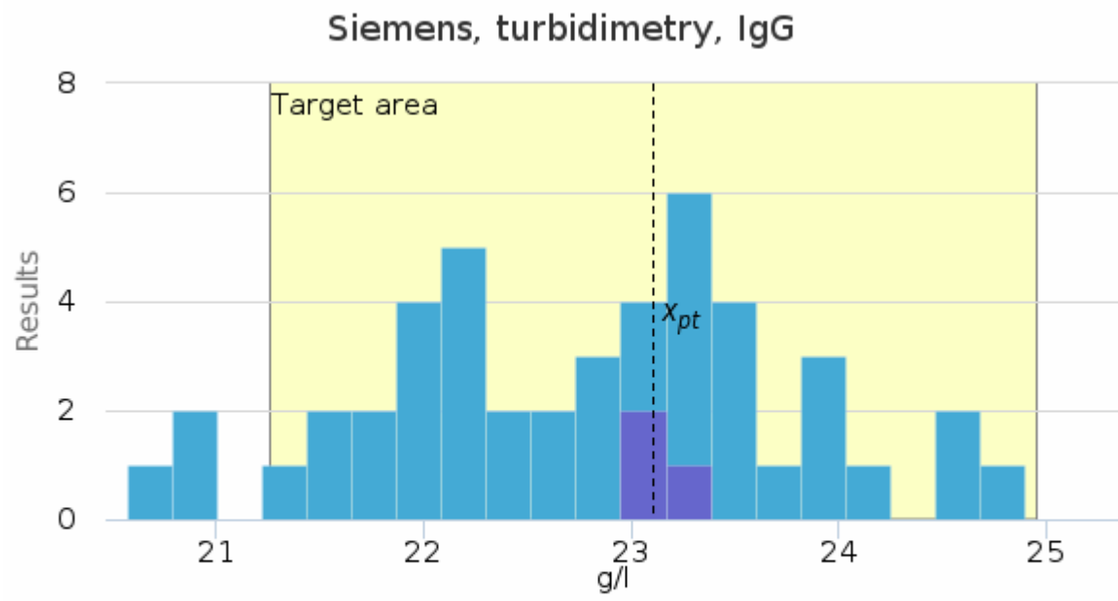




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

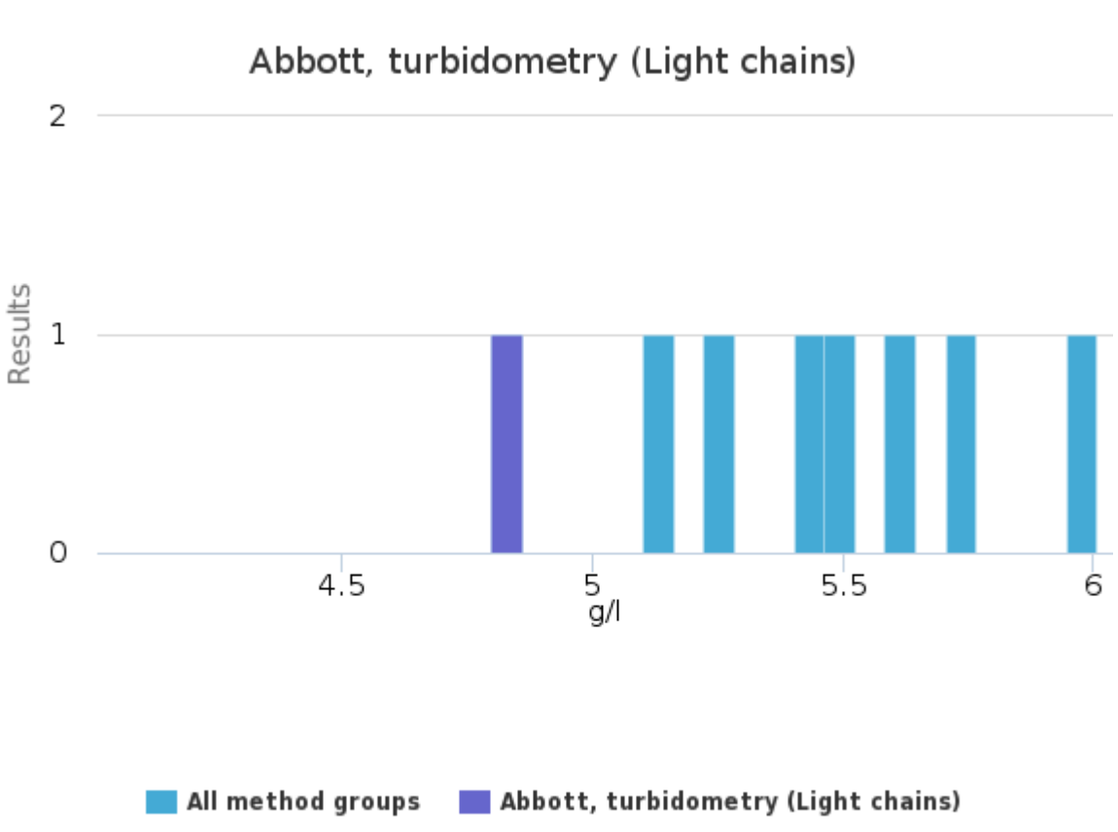


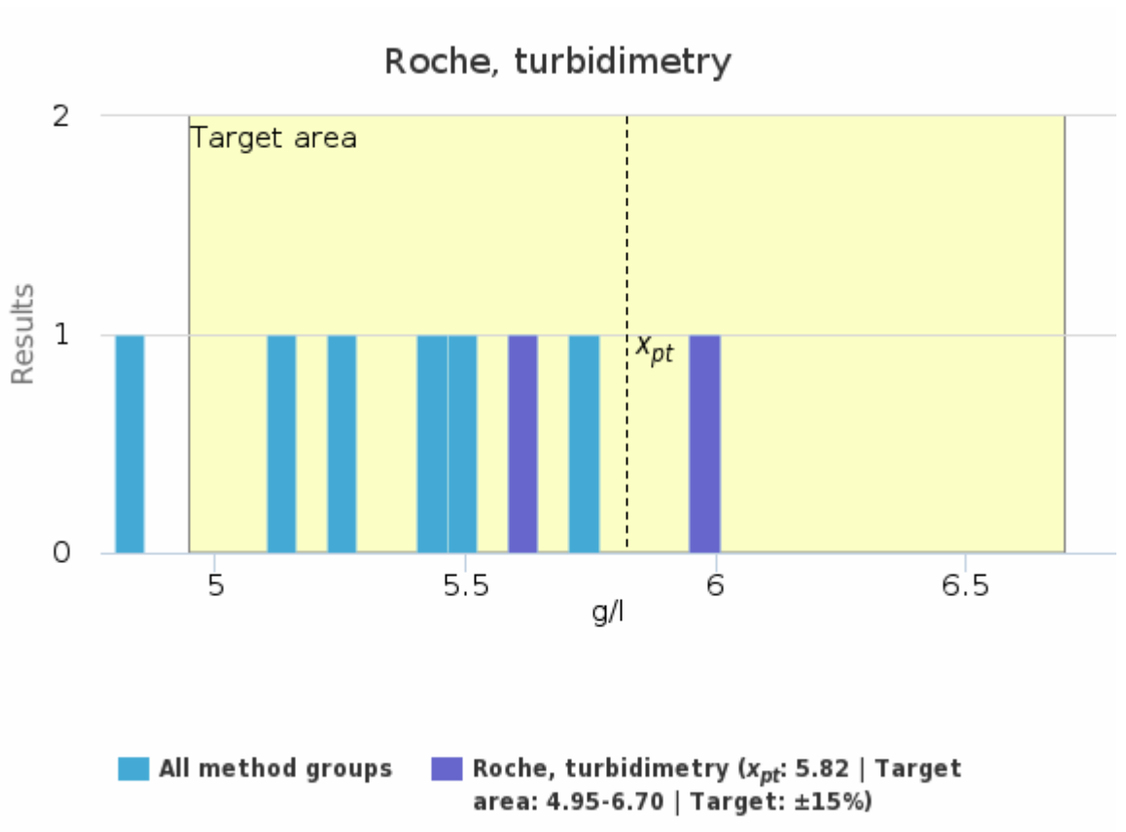


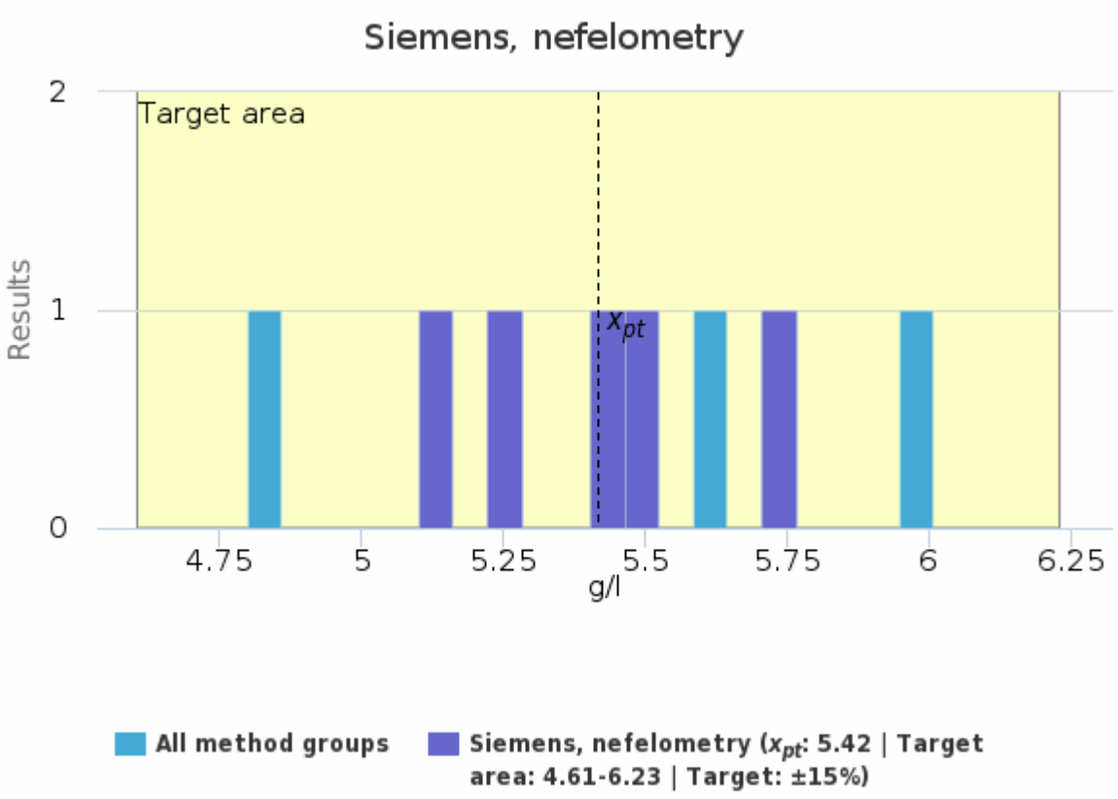
Specimen S002 | IgLCKappa, total, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidometry (Light chains)	-	-	-	-	-	4.80	4.80	-	1
Roche, turbidimetry	5.82	5.82	0.26	4.5	0.18	5.64	6.01	-	2
Siemens, nefelometry	5.42	5.44	0.24	4.4	0.11	5.15	5.76	-	5
All	**5.44**	**5.47**	**0.38**	**7.0**	**0.13**	**4.80**	**6.01**	**-**	**8**

Specimen S002 | IgLCKappa, total, g/l| histogram summaries in LabScala



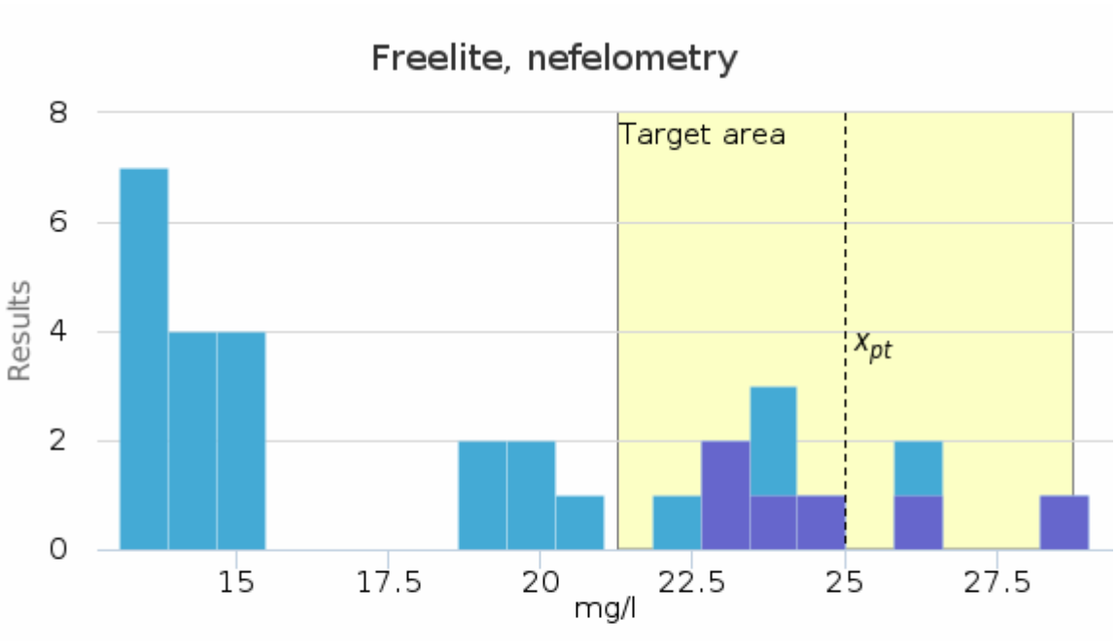


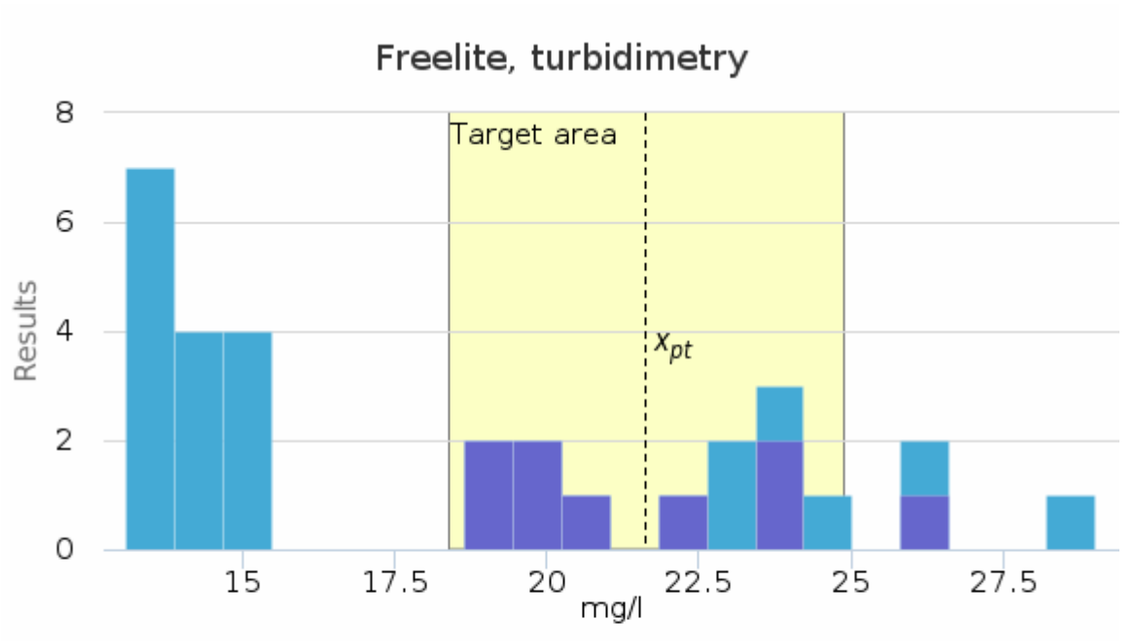


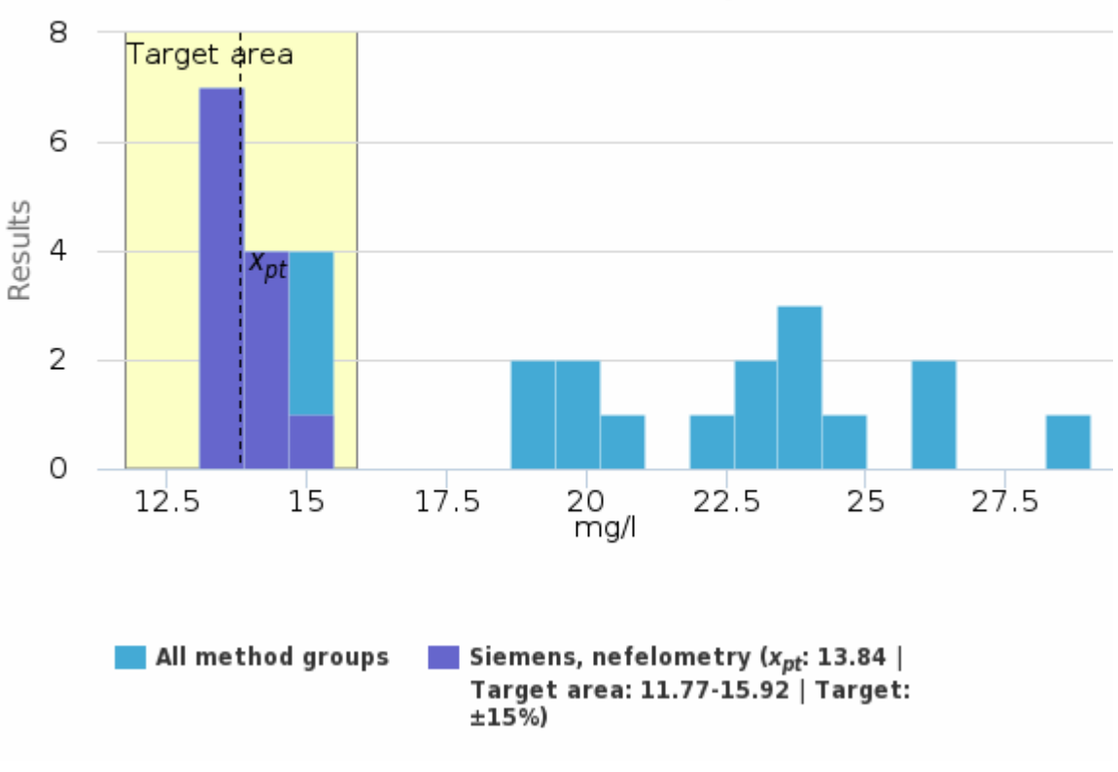
Specimen S002 | IgLCKappa, free, mg/l

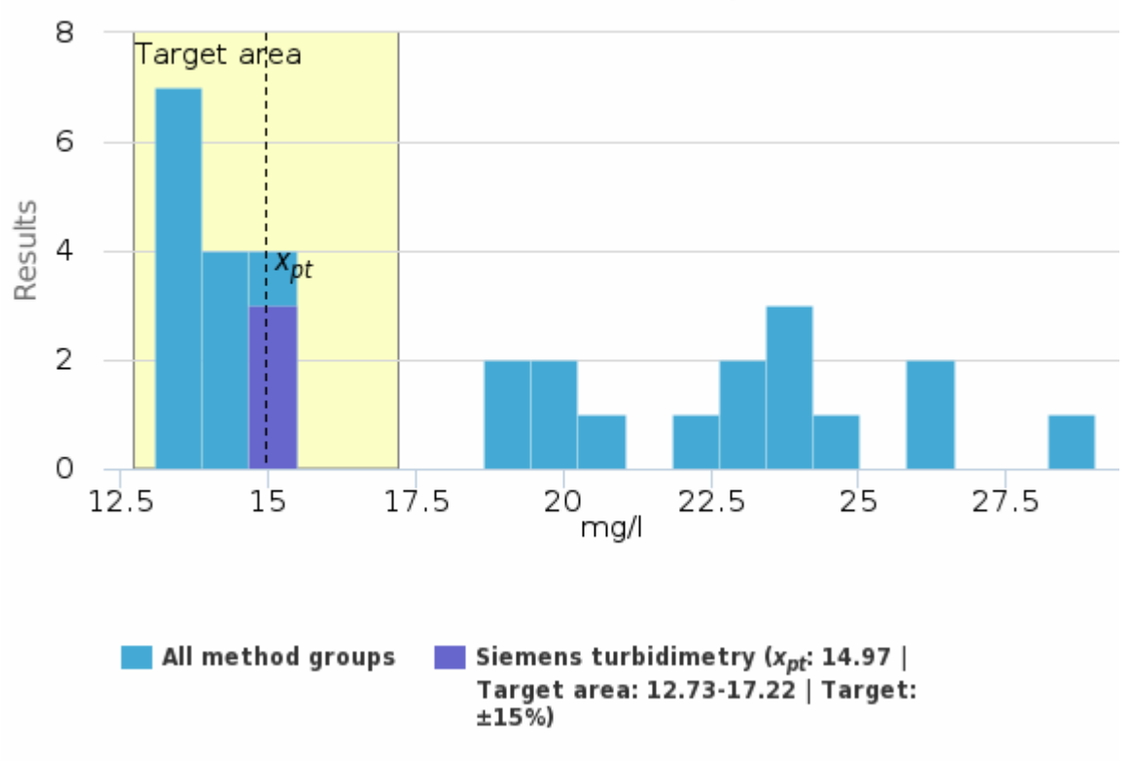
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Freelite, nefelometry	25.02	24.30	2.18	8.7	0.89	23.20	29.00	-	6
Freelite, turbidimetry	21.63	20.39	2.63	12.1	0.88	19.00	26.18	-	9
Siemens, nefelometry	13.84	13.75	0.59	4.3	0.17	13.10	15.10	-	12
Siemens turbidimetry	14.97	14.97	0.13	0.9	0.07	14.84	15.10	-	3
All	**18.53**	**17.05**	**5.00**	**27.0**	**0.91**	**13.10**	**29.00**	**-**	**30**

Specimen S002 | IgLCKappa, free, mg/l| histogram summaries in LabScala





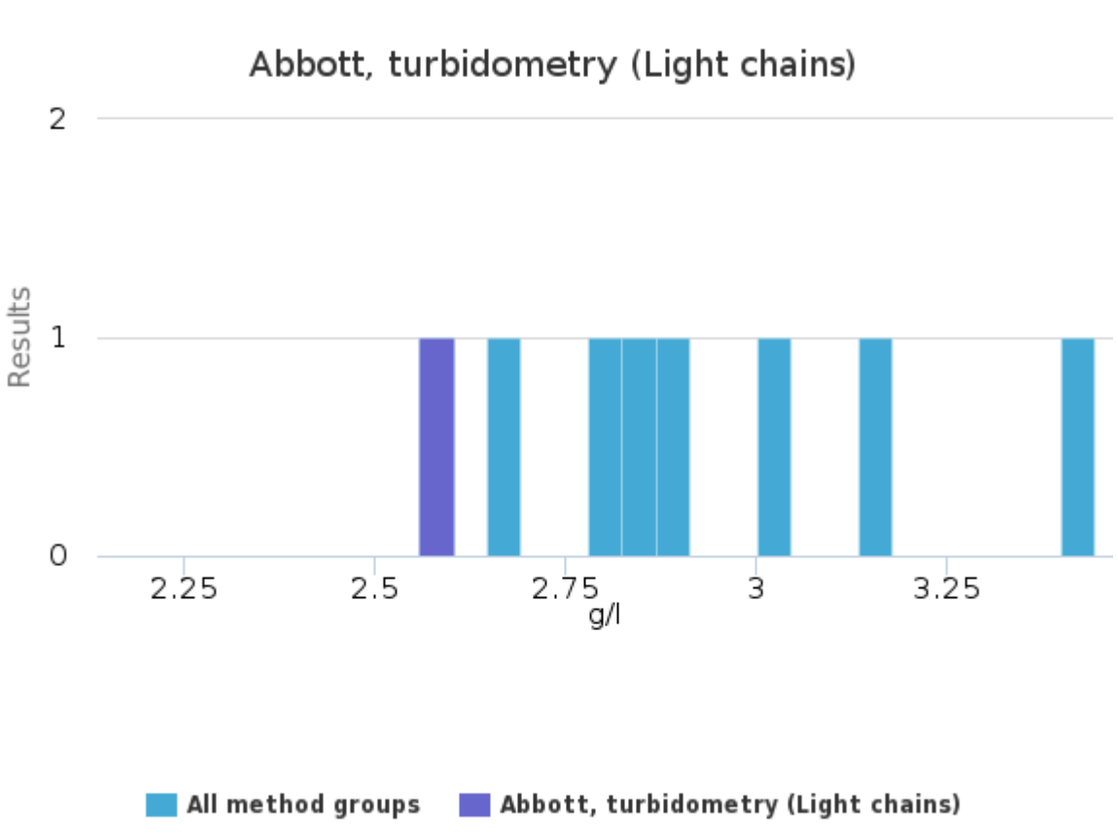


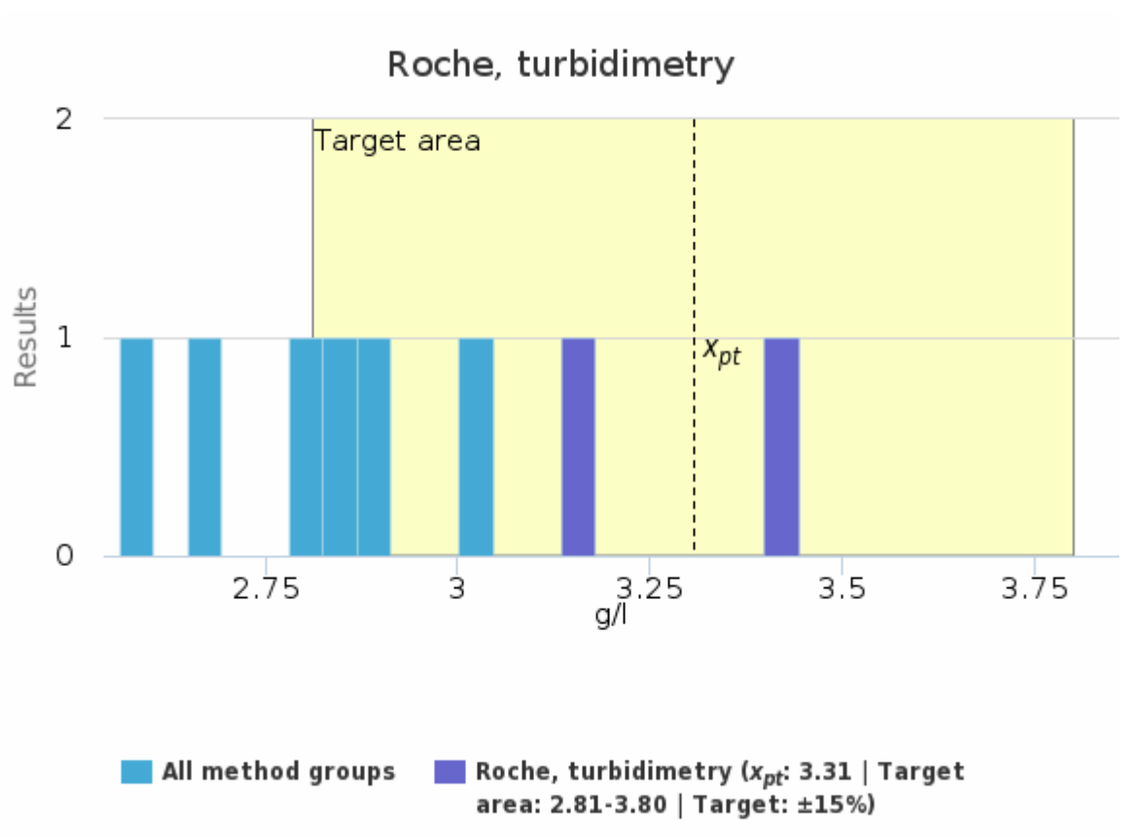


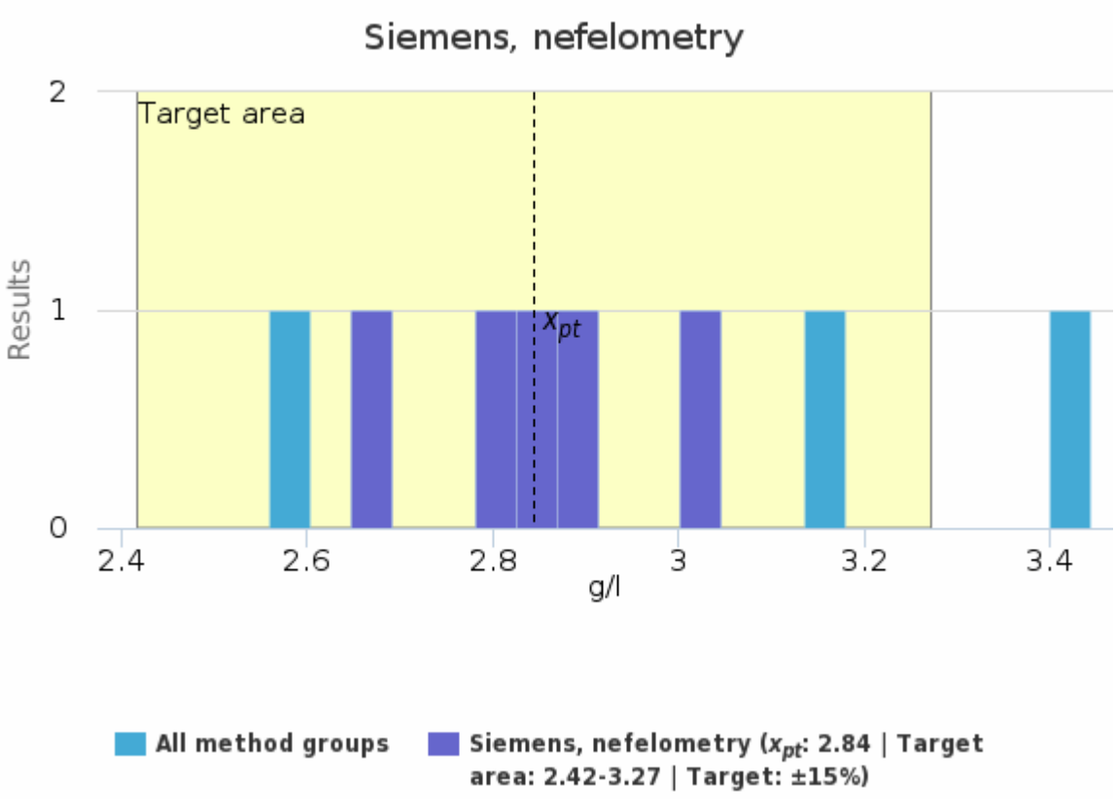
Specimen S002 | IgLCLambda, total, g/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidometry (Light chains)	-	-	-	-	-	2.56	2.56	-	1
Roche, turbidimetry	3.31	3.31	0.19	5.9	0.14	3.17	3.44	-	2
Siemens, nefelometry	2.84	2.83	0.13	4.6	0.06	2.68	3.04	-	5
All	**2.92**	**2.86**	**0.28**	**9.7**	**0.10**	**2.56**	**3.44**	**-**	**8**

Specimen S002 | IgLCLambda, total, g/l| histogram summaries in LabScala



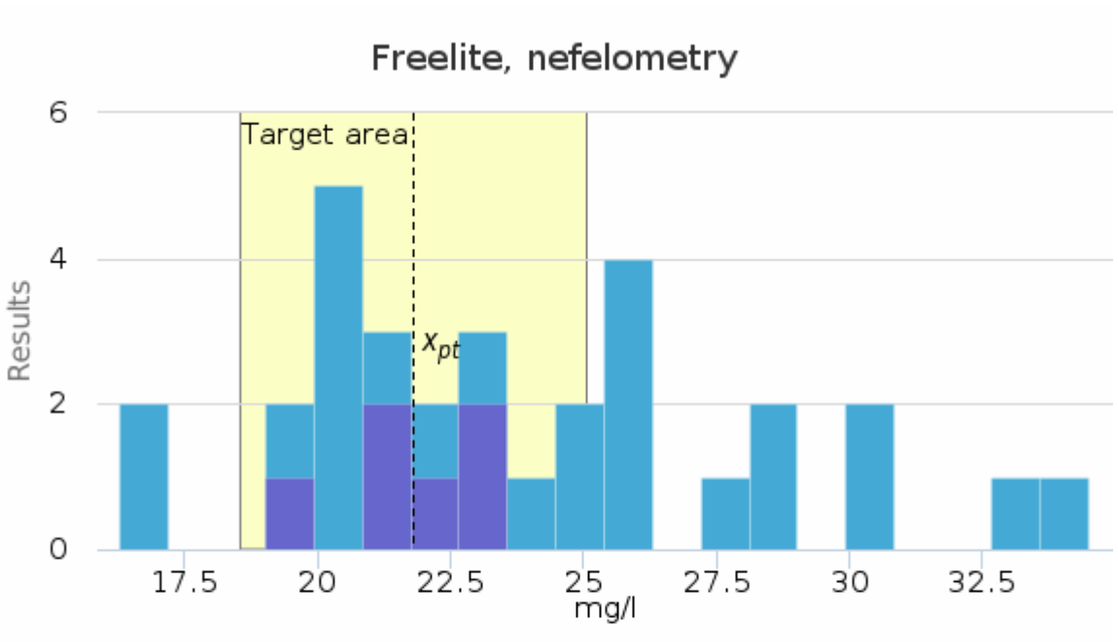


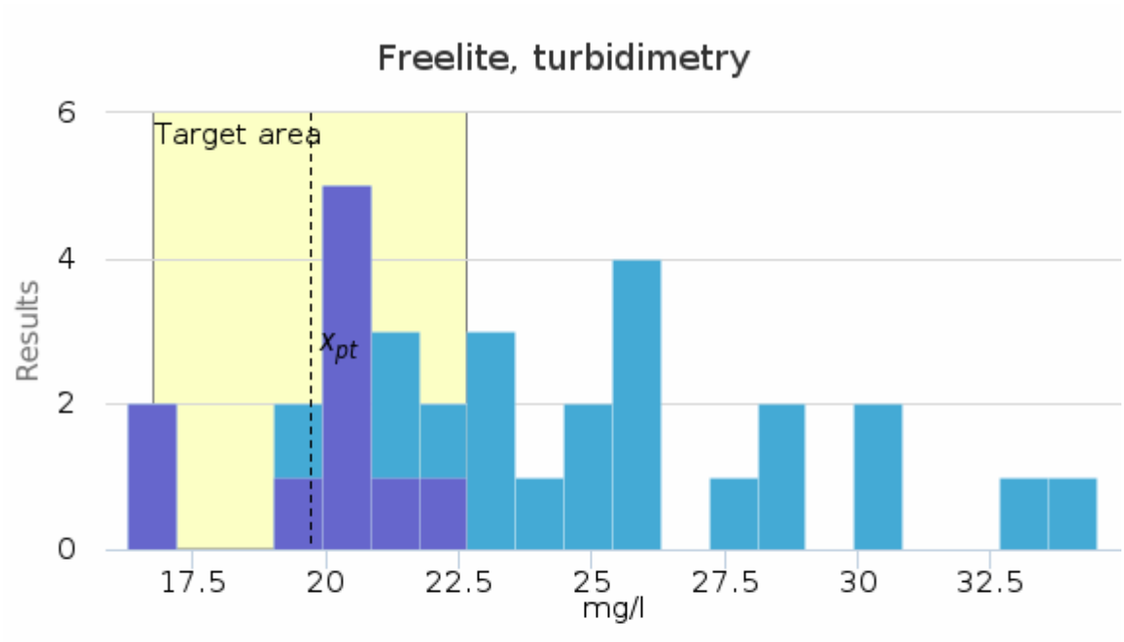


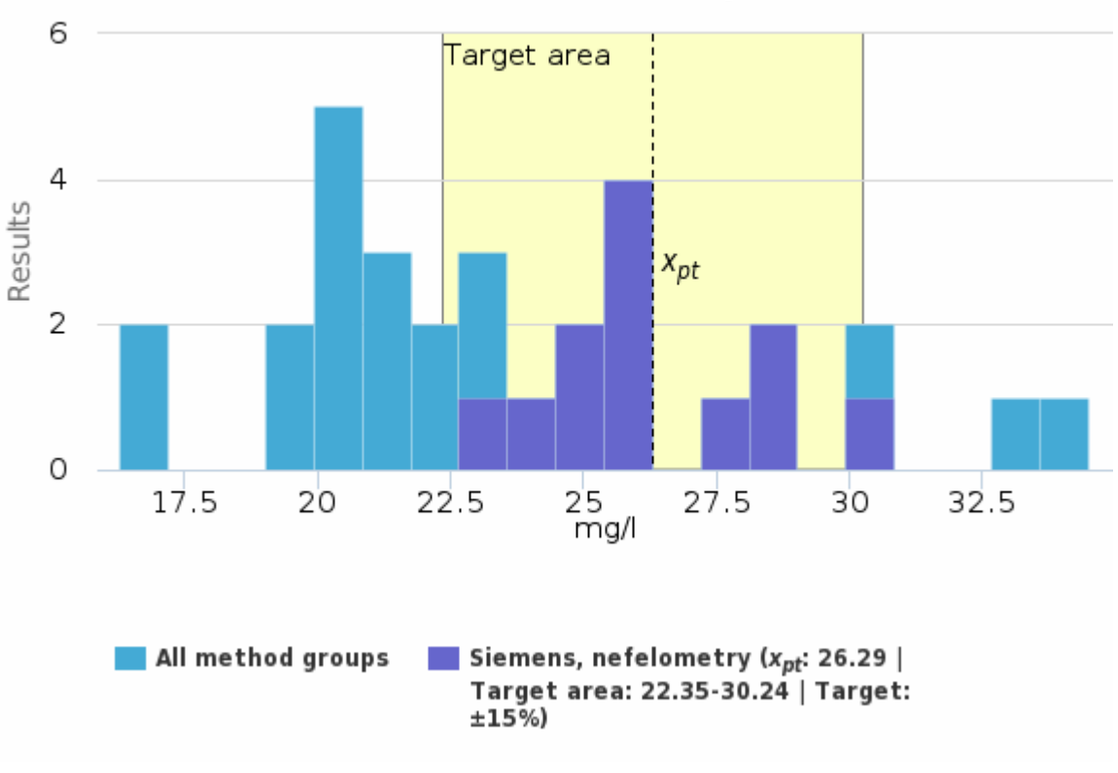
Specimen S002 | IgLCLambda, free, mg/l

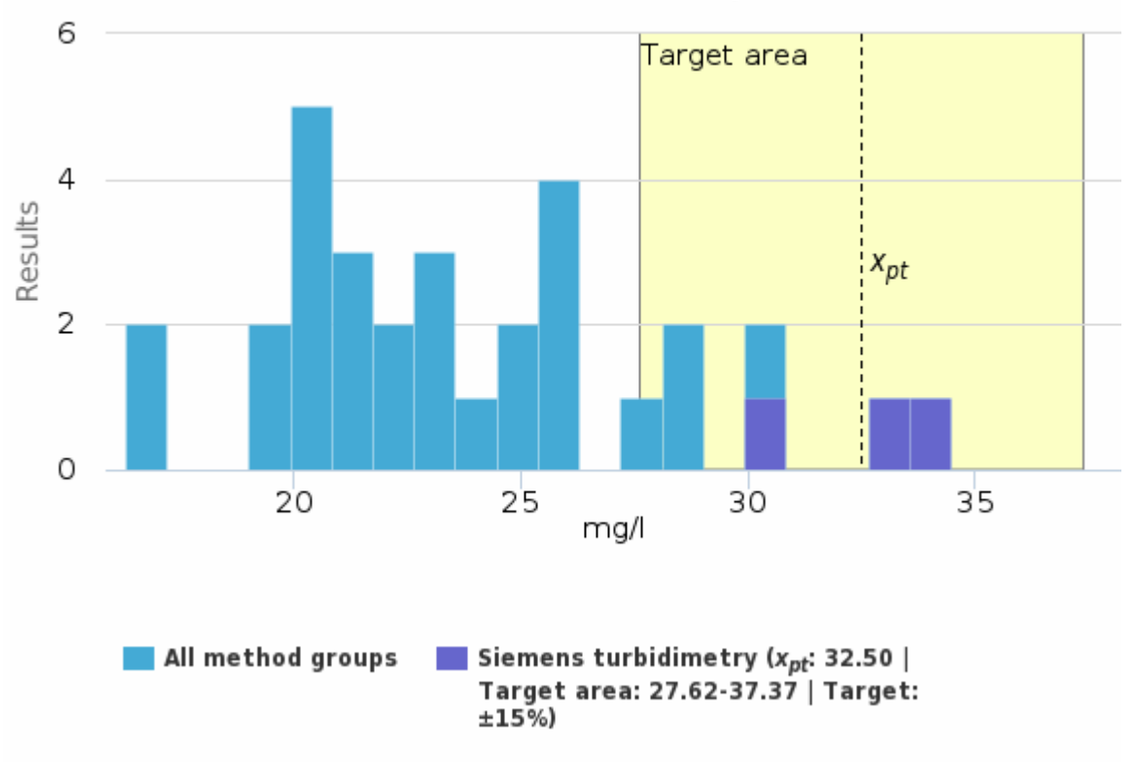
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Freelite, nefelometry	21.80	22.10	1.30	6.0	0.53	19.60	23.00	-	6
Freelite, turbidimetry	19.70	20.20	1.88	9.5	0.59	16.29	22.40	-	10
Siemens, nefelometry	26.29	25.95	2.17	8.3	0.63	22.70	30.30	-	12
Siemens turbidimetry	32.50	32.81	2.16	6.6	1.25	30.20	34.48	-	3
All	**23.90**	**22.90**	**4.45**	**18.6**	**0.80**	**16.29**	**34.48**	**-**	**31**

Specimen S002 | IgLCLambda, free, mg/l| histogram summaries in LabScala





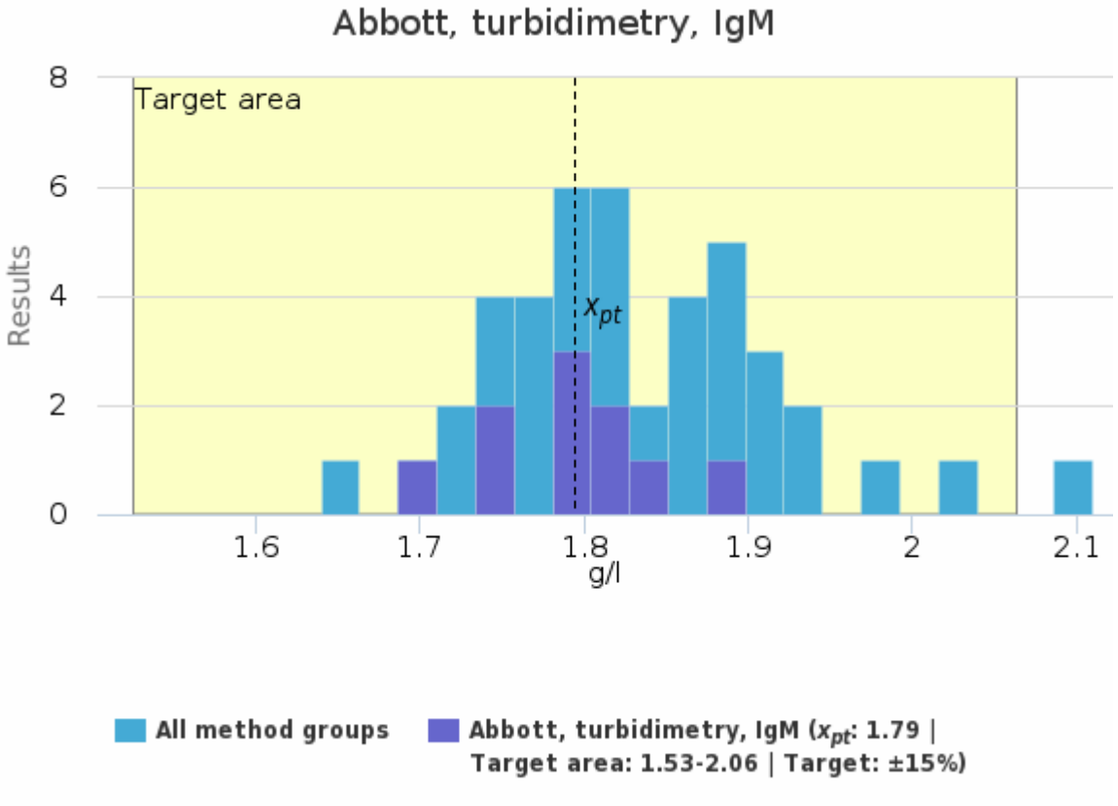


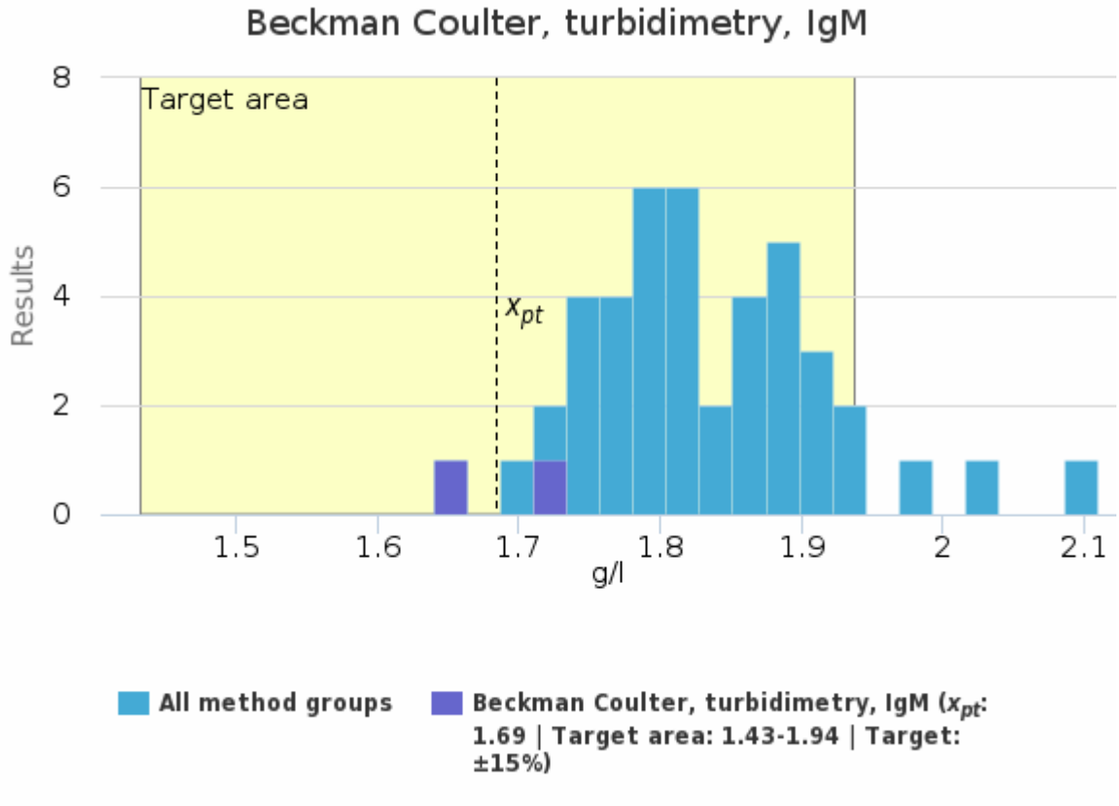


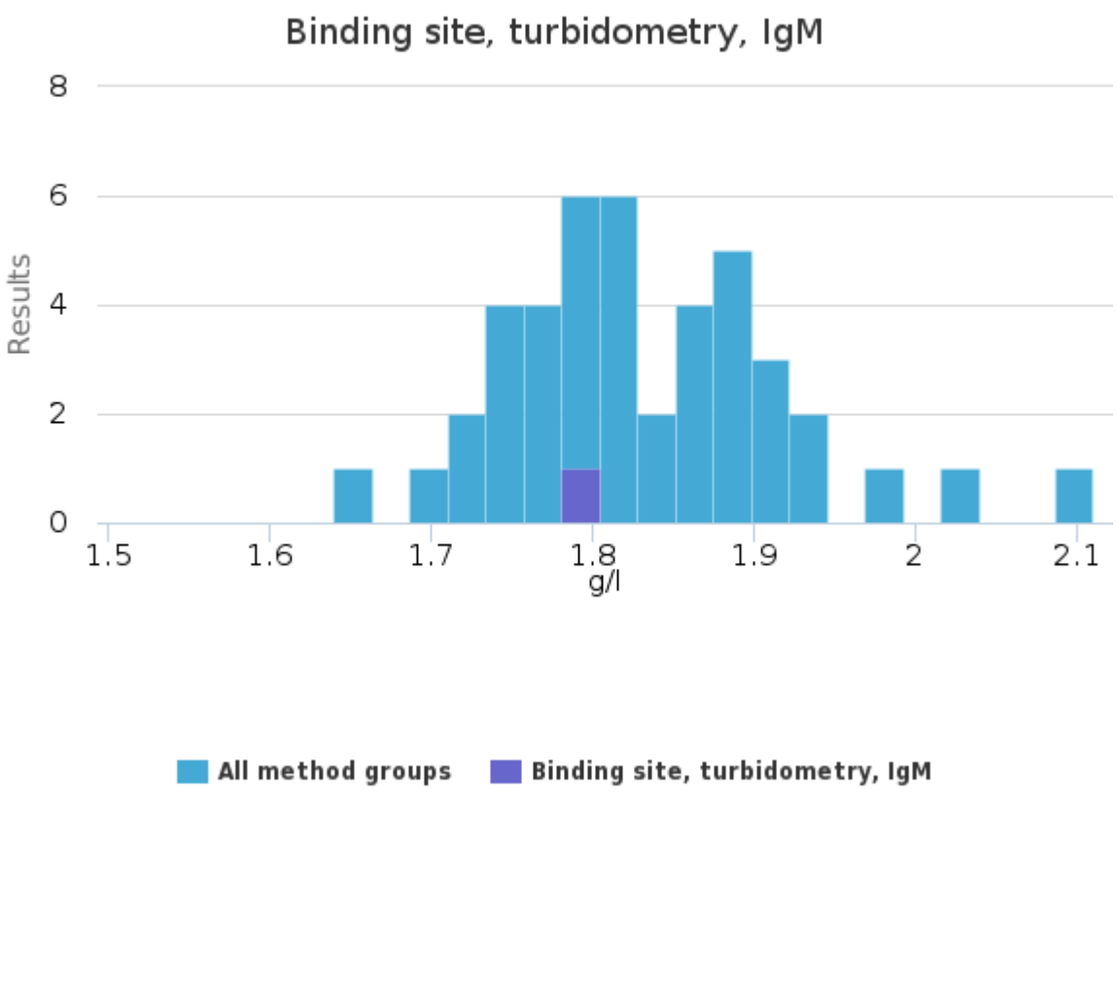
Specimen S002 | IgM, g/l

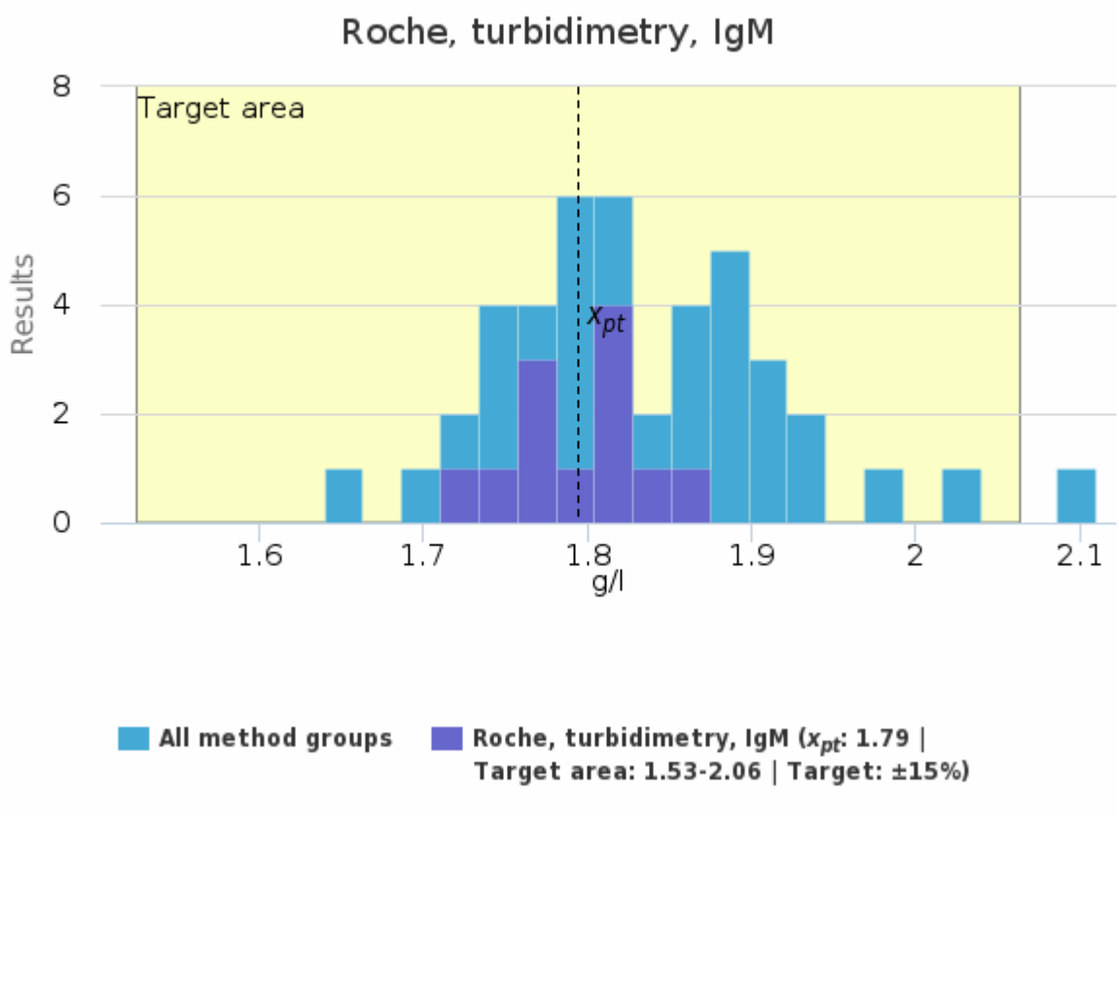
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, IgM	1.79	1.80	0.05	2.8	0.02	1.71	1.88	-	10
Beckman Coulter, turbidimetry, IgM	1.69	1.69	0.06	3.8	0.05	1.64	1.73	-	2
Binding site, turbidometry, IgM	-	-	-	-	-	1.79	1.79	-	1
Roche, turbidimetry, IgM	1.79	1.80	0.04	2.2	0.01	1.72	1.86	-	12
Siemens, nefelometry, IgM	1.92	1.91	0.08	4.0	0.02	1.80	2.11	-	14
Siemens, turbidimetry, IgM	1.83	1.86	0.08	4.4	0.05	1.74	1.89	-	3
Thermo Scientific, turbidimetry, IgM	-	-	-	-	-	1.77	1.77	-	1
All	**1.83**	**1.82**	**0.08**	**4.2**	**0.01**	**1.64**	**2.03**	**1**	**43**

Specimen S002 | IgM, g/l| histogram summaries in LabScala



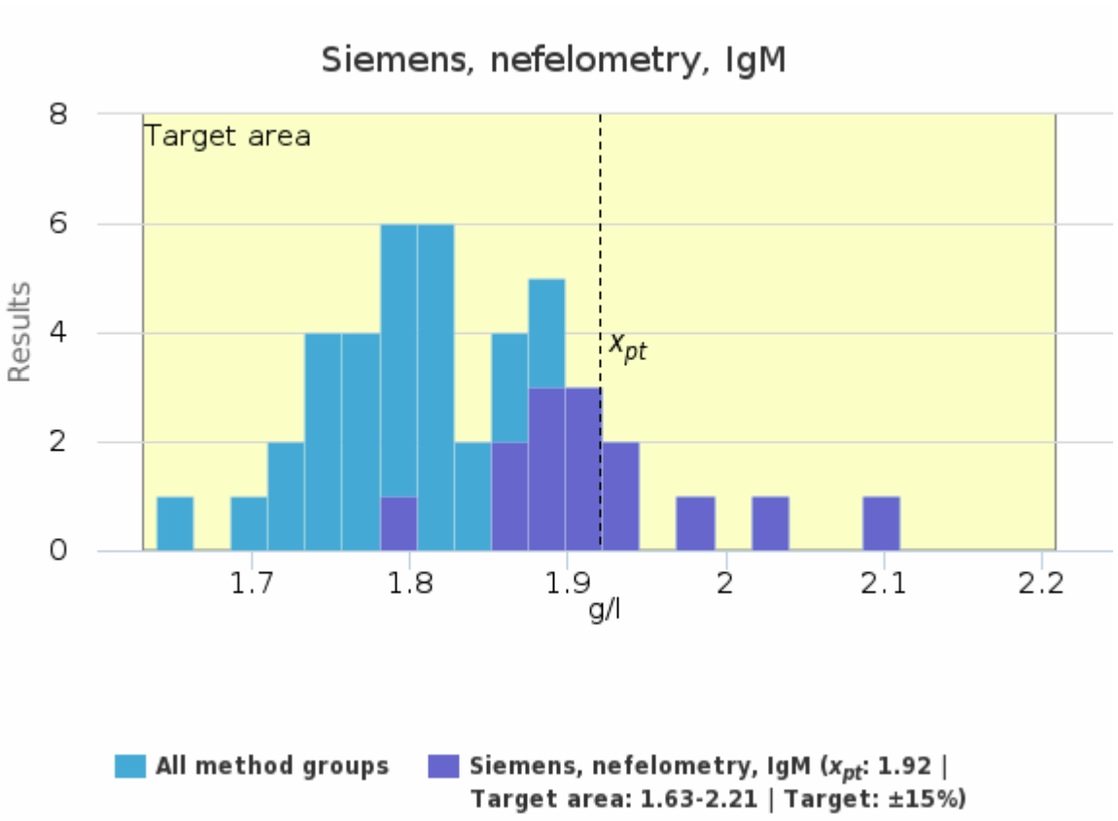


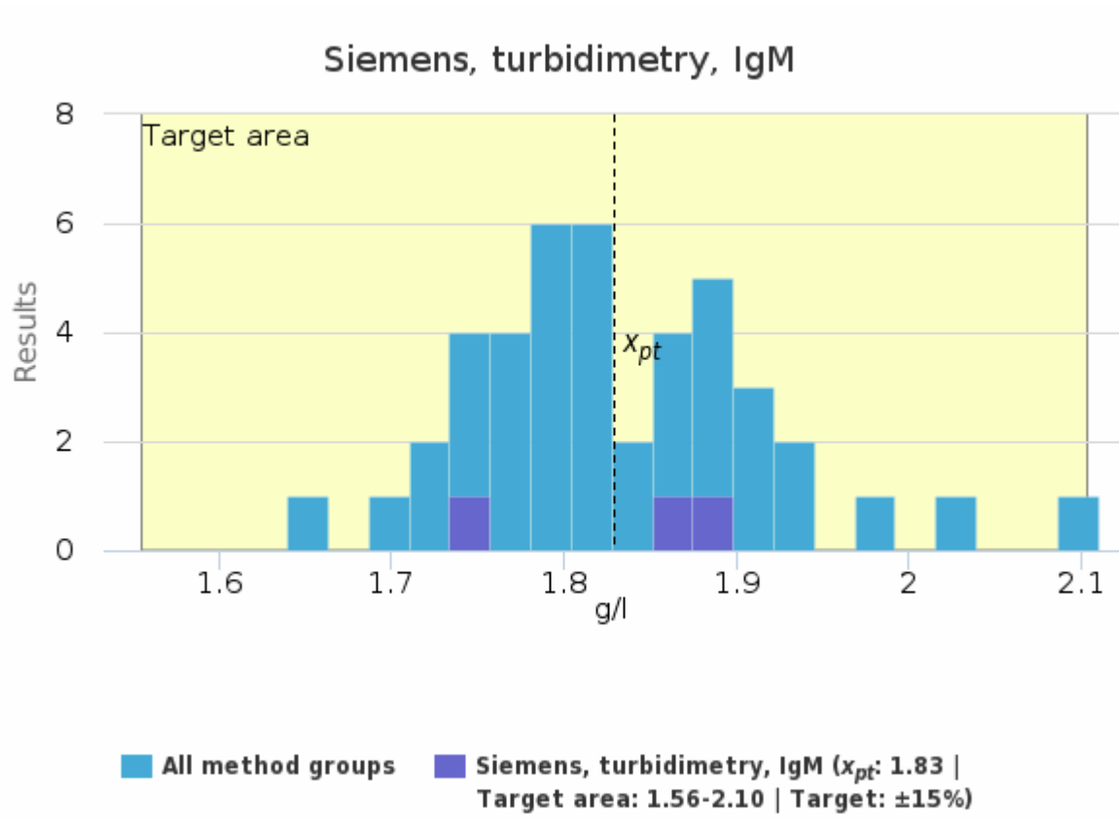


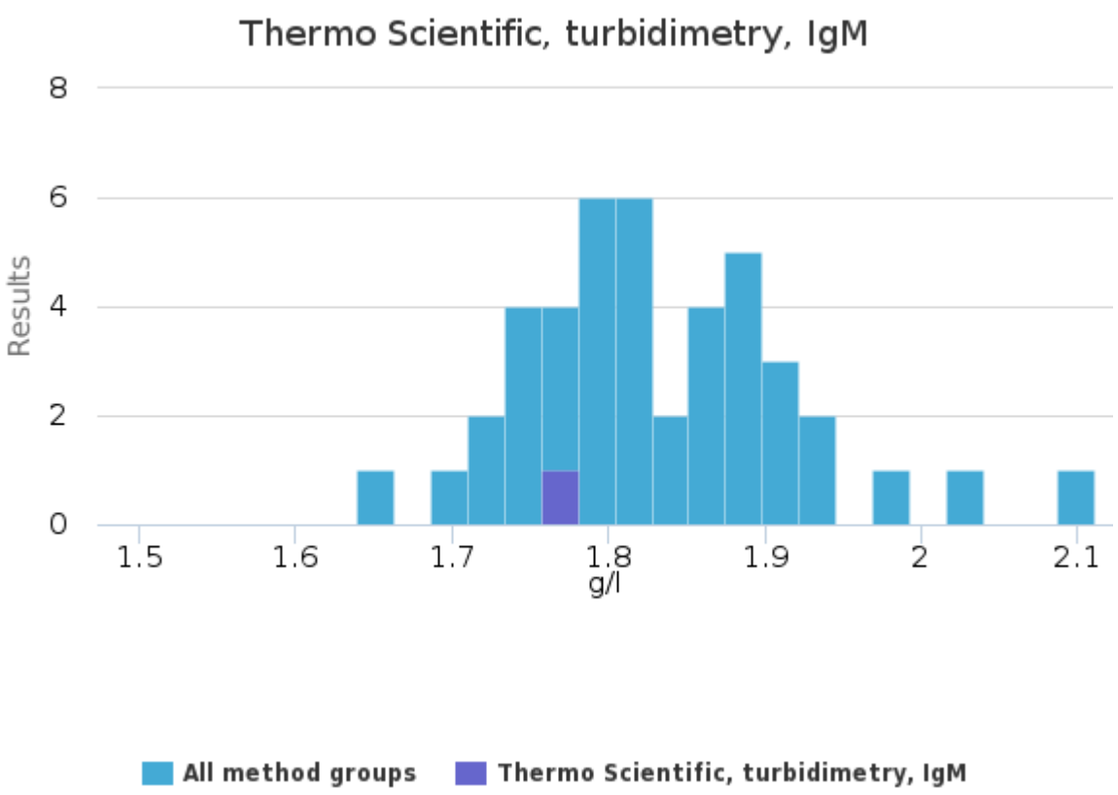


Proteins, immunochemical determinations, January, 1-2023

Quantitative report



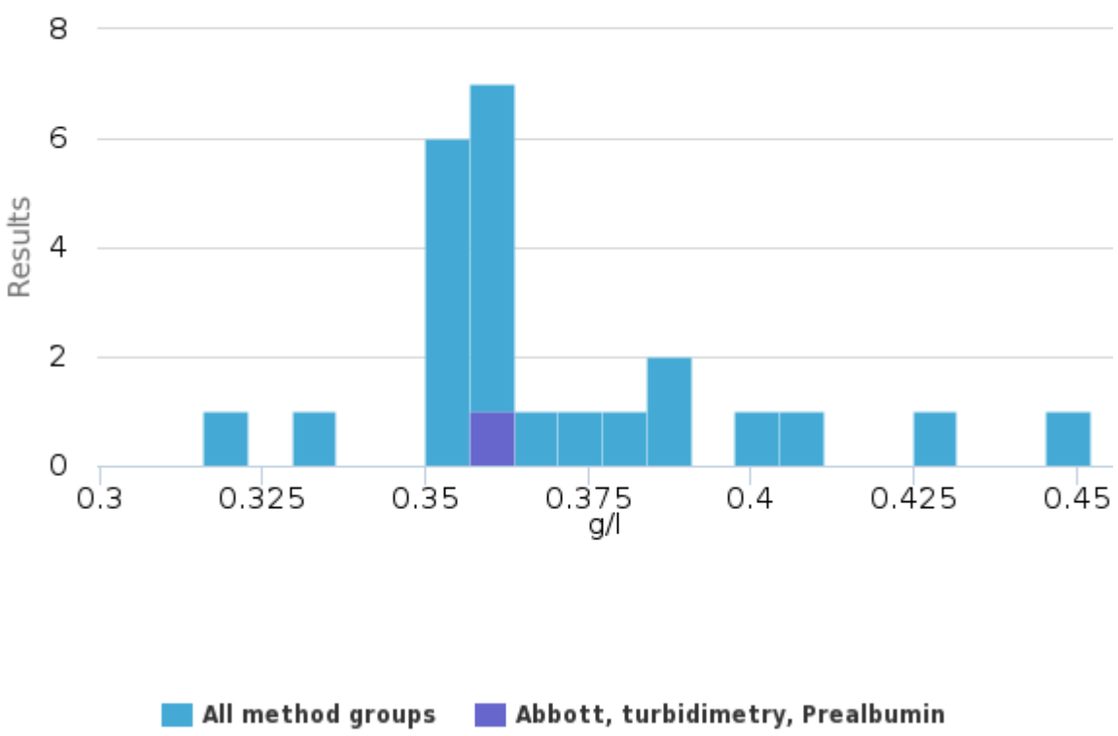


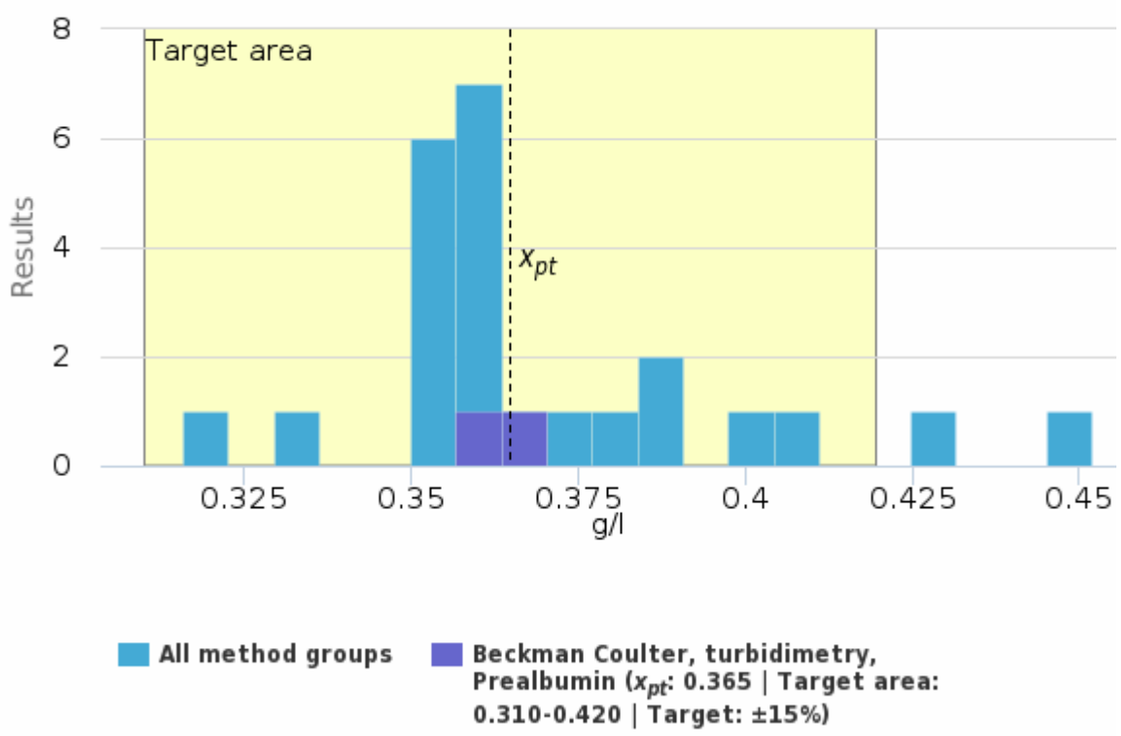


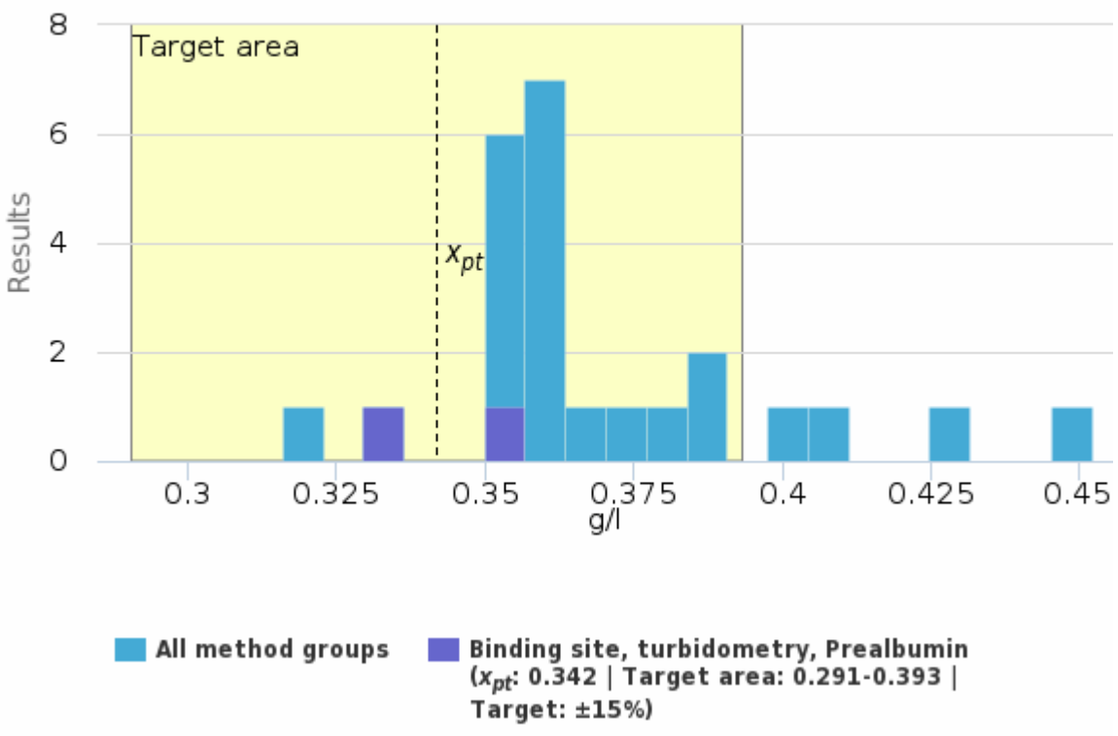
Specimen S002 | Prealbumin / Transtyretin, g/l

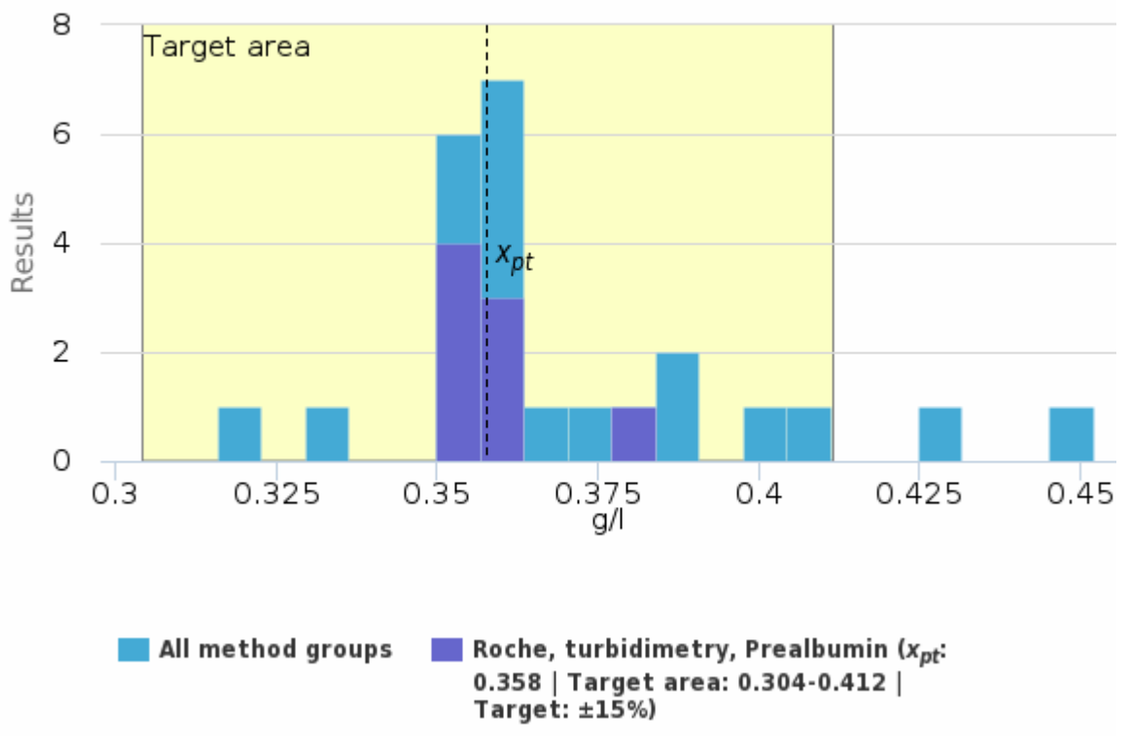
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Prealbumin	-	-	-	-	-	0.360	0.360	-	1
Beckman Coulter, turbidimetry, Prealbumin	0.365	0.365	0.007	1.9	0.005	0.360	0.370	-	2
Binding site, turbidometry, Prealbumin	0.342	0.342	0.013	3.7	0.009	0.333	0.351	-	2
Roche, turbidimetry, Prealbumin	0.358	0.355	0.011	3.0	0.004	0.350	0.381	-	8
Siemens, nefelometry, Prealbumin	0.391	0.390	0.040	10.1	0.013	0.316	0.452	-	9
Siemens, turbidimetry, Prealbumin	0.355	0.355	0.007	2.0	0.005	0.350	0.360	-	2
All	**0.366**	**0.360**	**0.025**	**6.8**	**0.005**	**0.316**	**0.430**	**1**	**24**

Specimen S002 | Prealbumin / Transtyretin, g/l| histogram summaries in LabScala



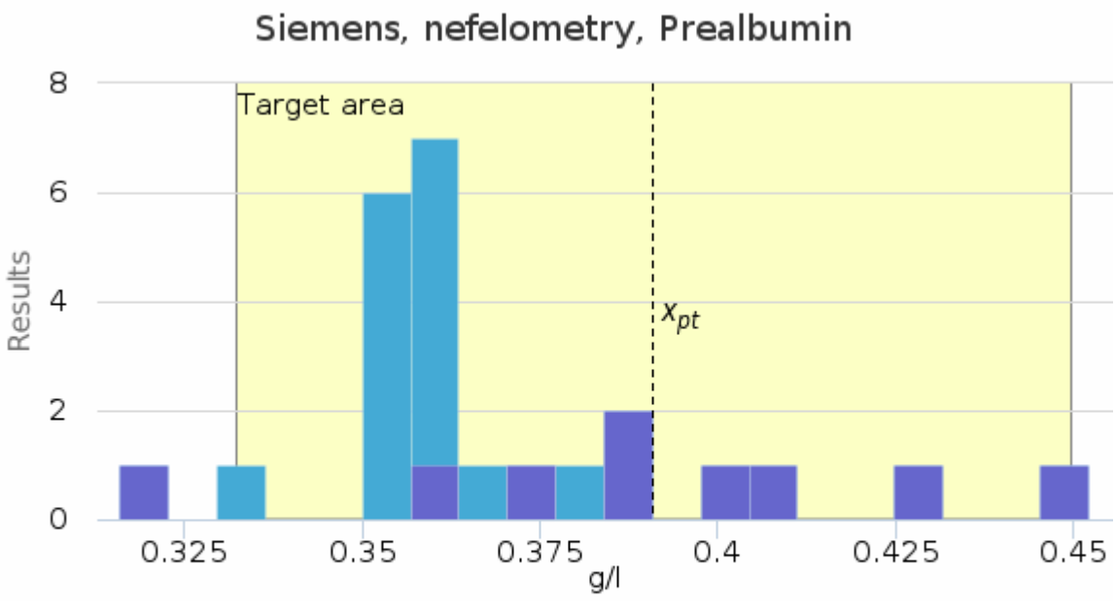


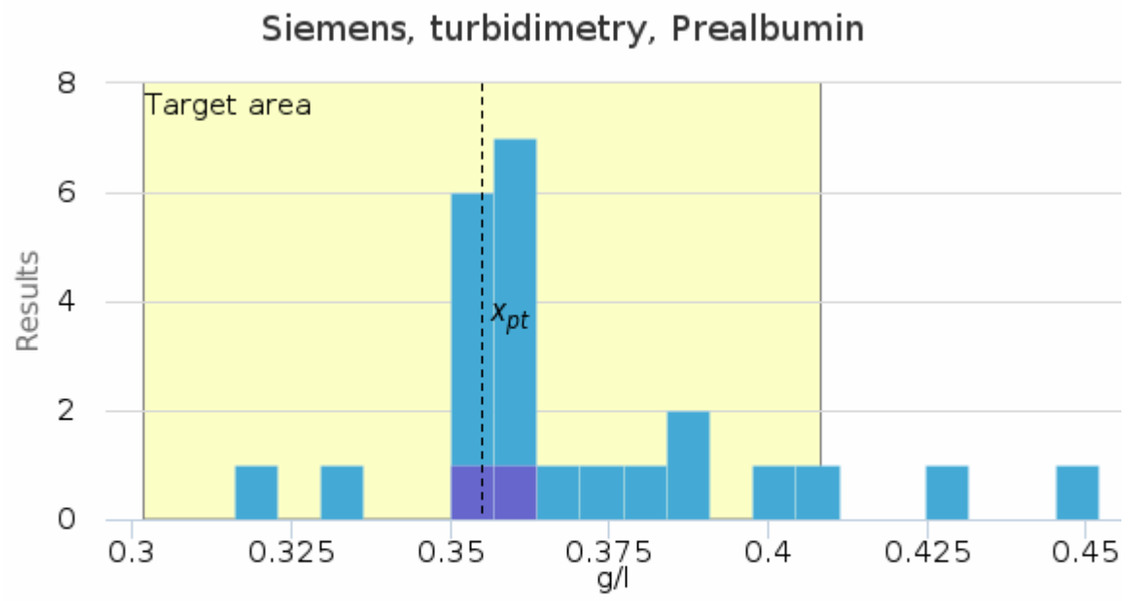




Proteins, immunochemical determinations, January, 1-2023

Quantitative report

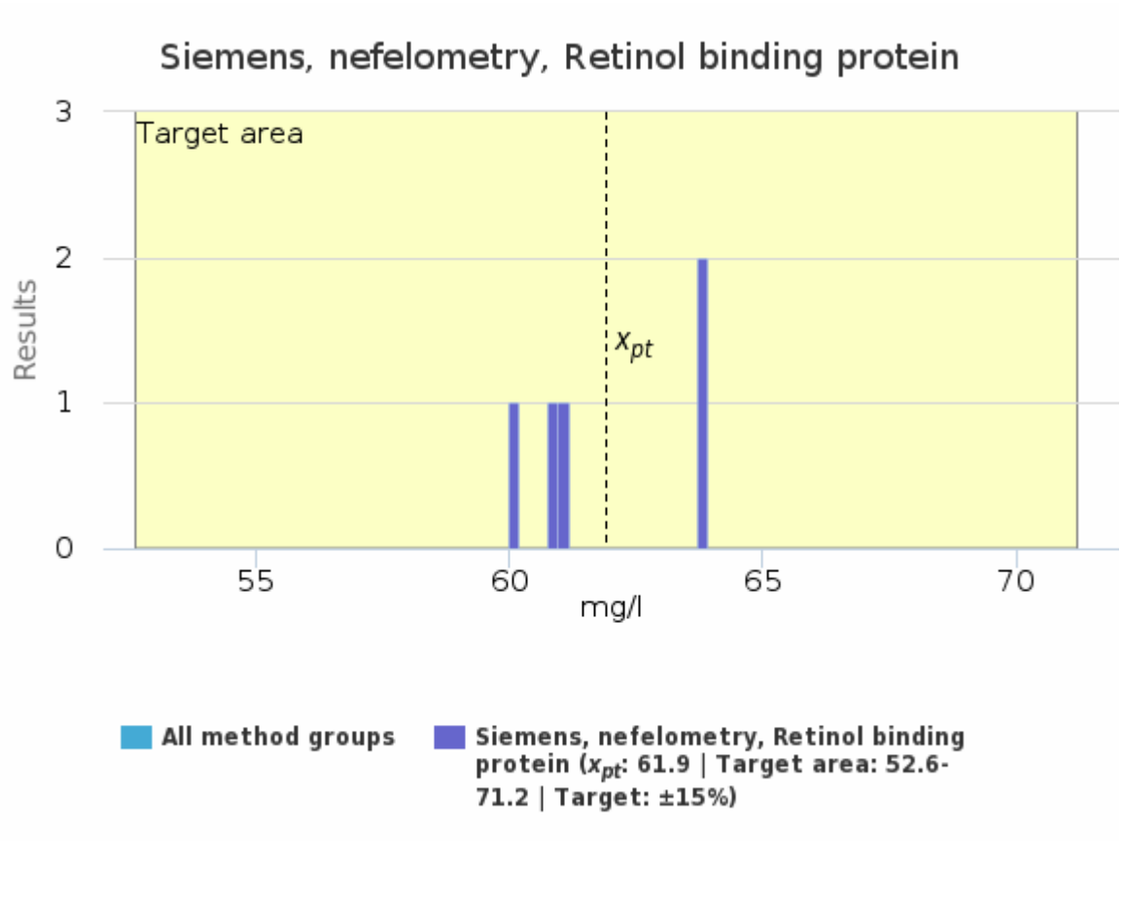




Specimen S002 | Retinol Binding Prot, mg/l

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Siemens, nefelometry, Retinol binding protein	61.9	61.0	1.8	2.9	0.8	60.0	63.9	-	5
All	**61.9**	**61.0**	**1.8**	**2.9**	**0.8**	**60.0**	**63.9**	**-**	**5**

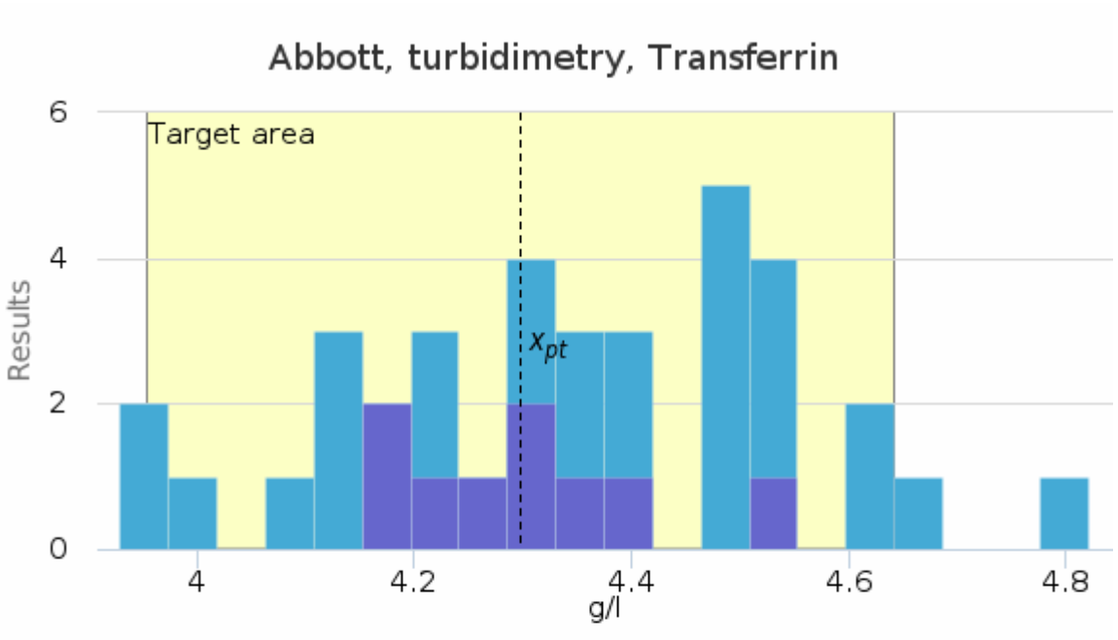
Specimen S002 | Retinol Binding Prot, mg/l| histogram summaries in LabScala

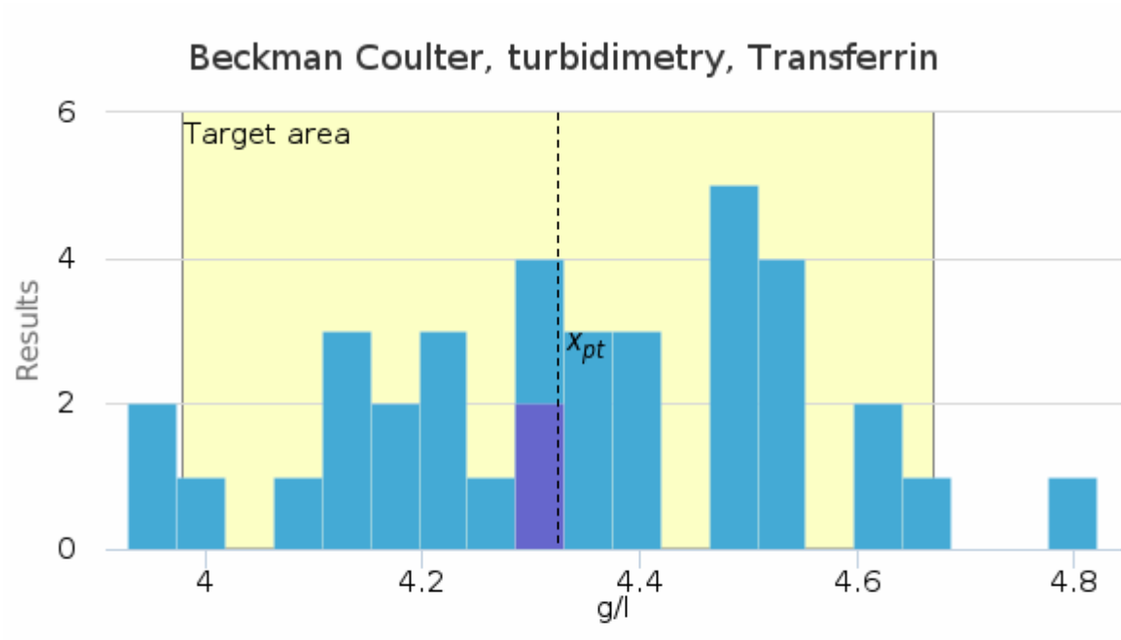


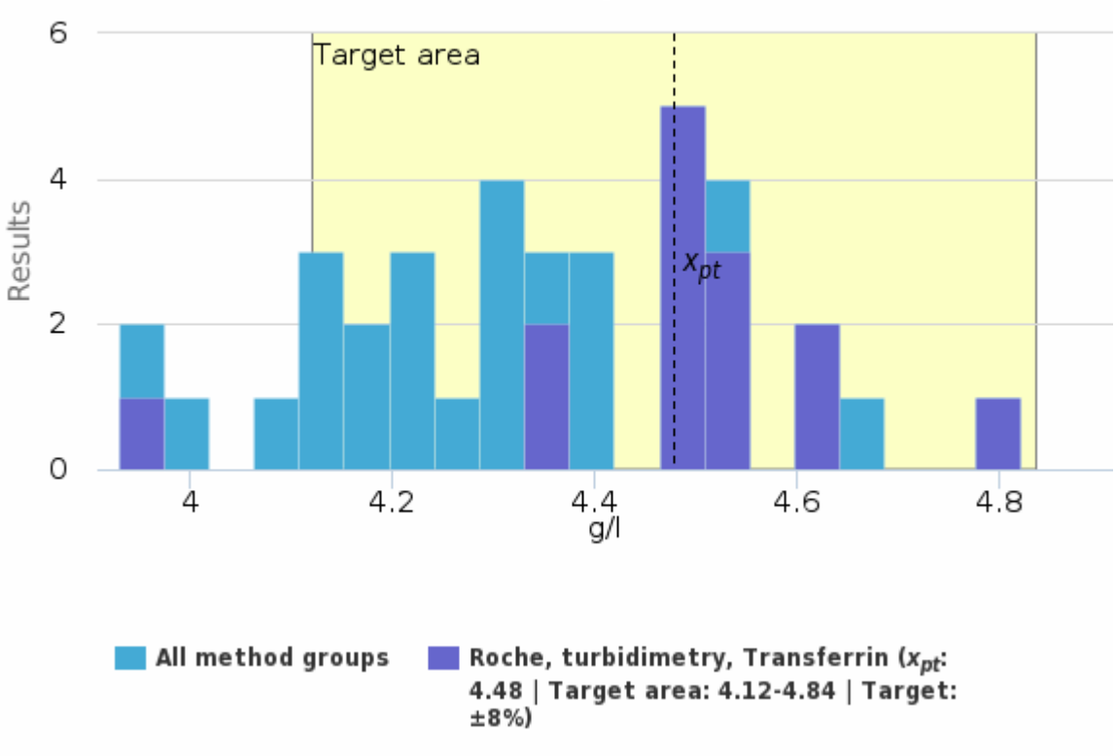
Specimen S002 | Transferrin, g/l

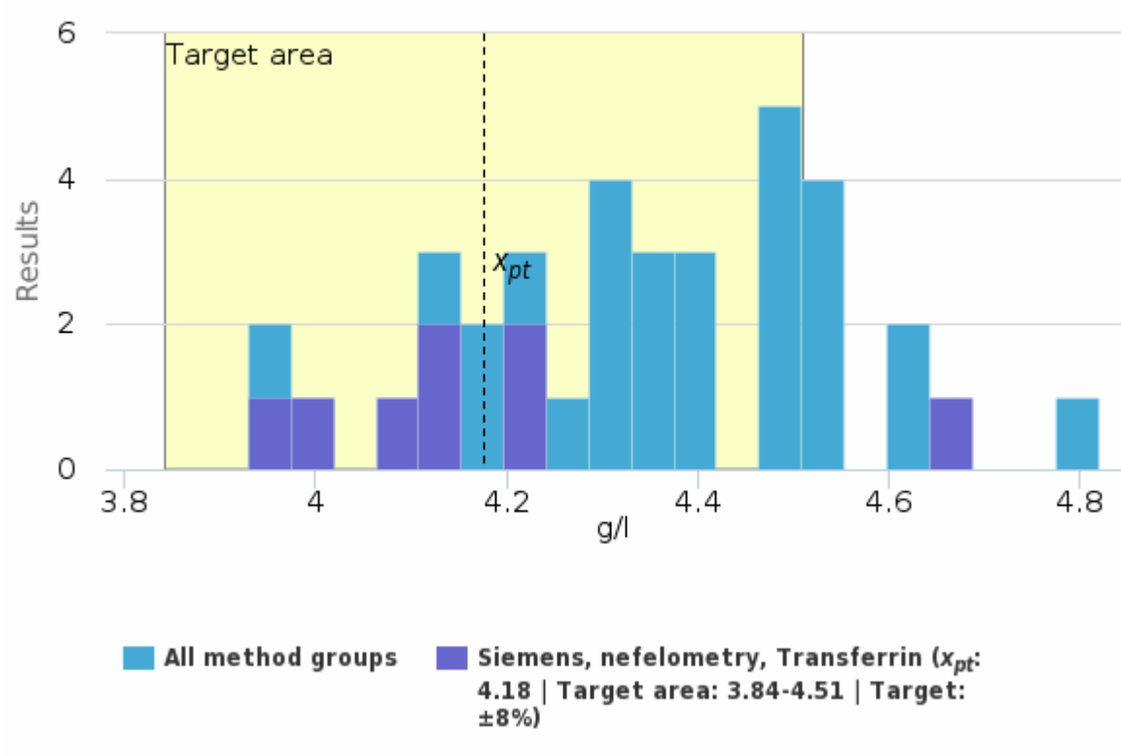
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidimetry, Transferrin	4.30	4.29	0.12	2.7	0.04	4.17	4.54	-	9
Beckman Coulter, turbidimetry, Transferrin	4.33	4.33	<0.01	0.2	<0.01	4.32	4.33	-	2
Roche, turbidimetry, Transferrin	4.48	4.50	0.20	4.4	0.05	3.93	4.82	-	14
Siemens, nefelometry, Transferrin	4.18	4.12	0.22	5.3	0.08	3.96	4.67	-	8
Siemens, turbidimetry, Transferrin	4.30	4.38	0.15	3.4	0.09	4.13	4.39	-	3
All	**4.34**	**4.34**	**0.21**	**4.8**	**0.03**	**3.93**	**4.82**	**-**	**36**

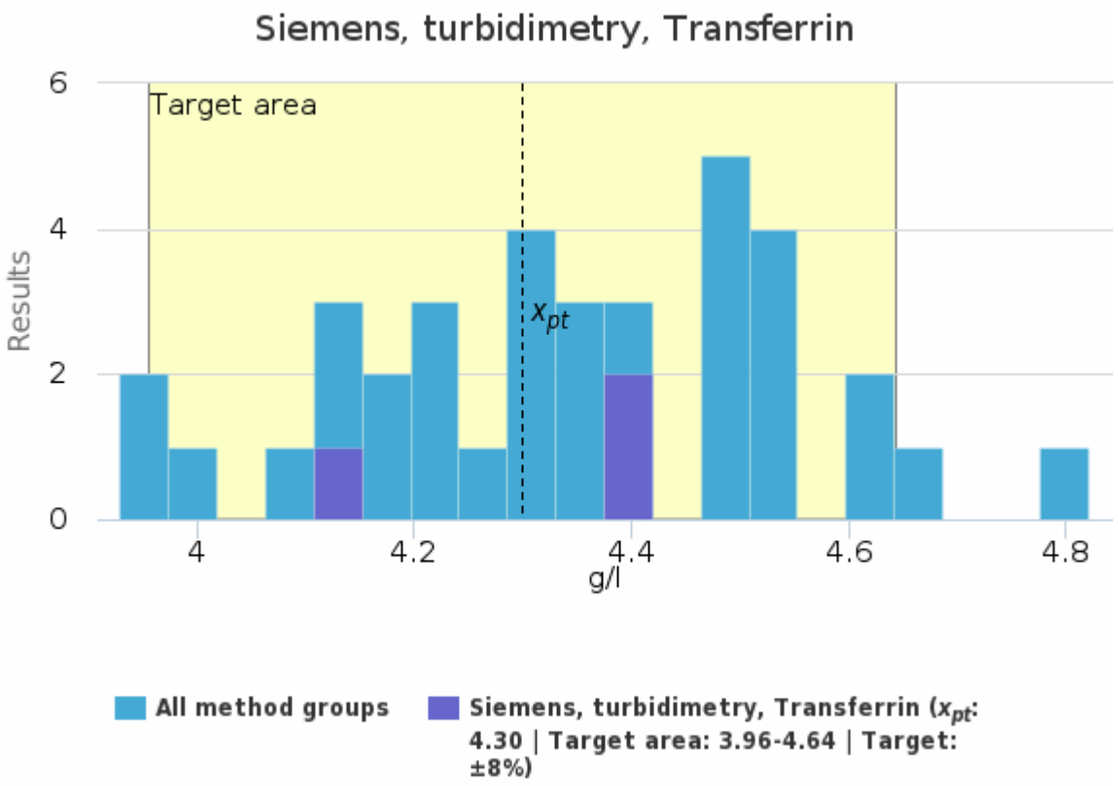
Specimen S002 | Transferrin, g/l| histogram summaries in LabScala







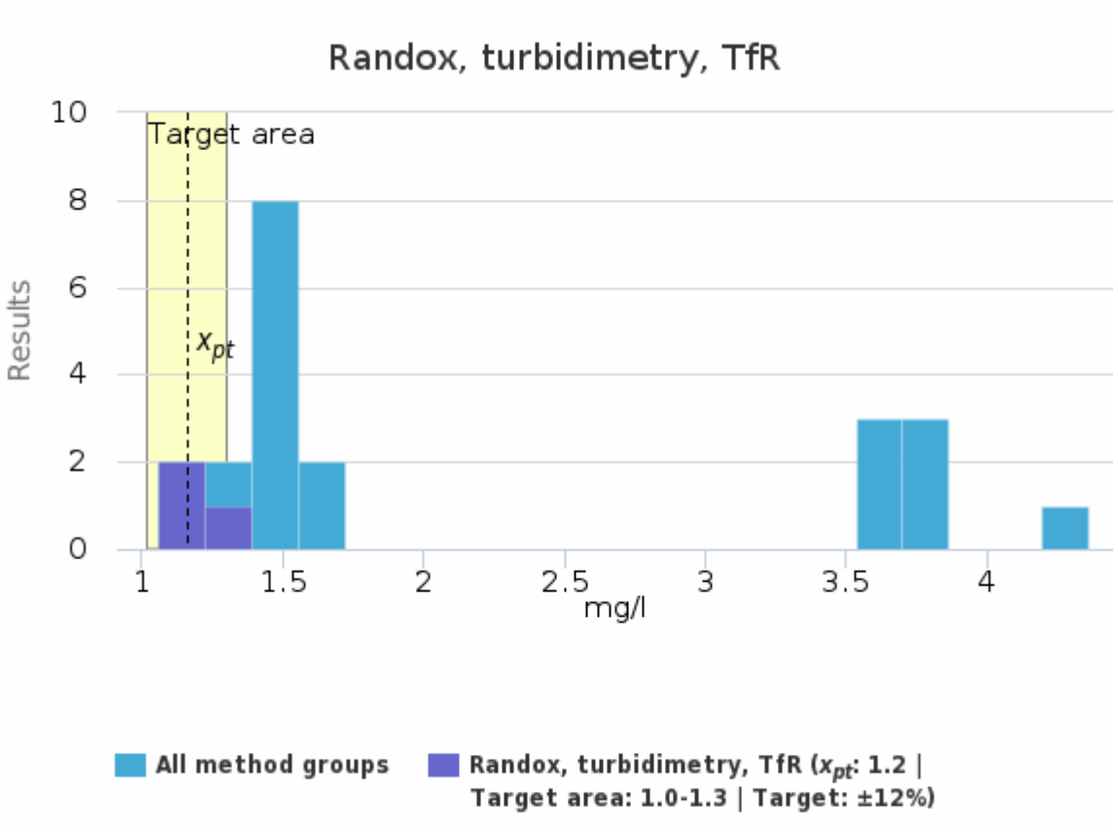


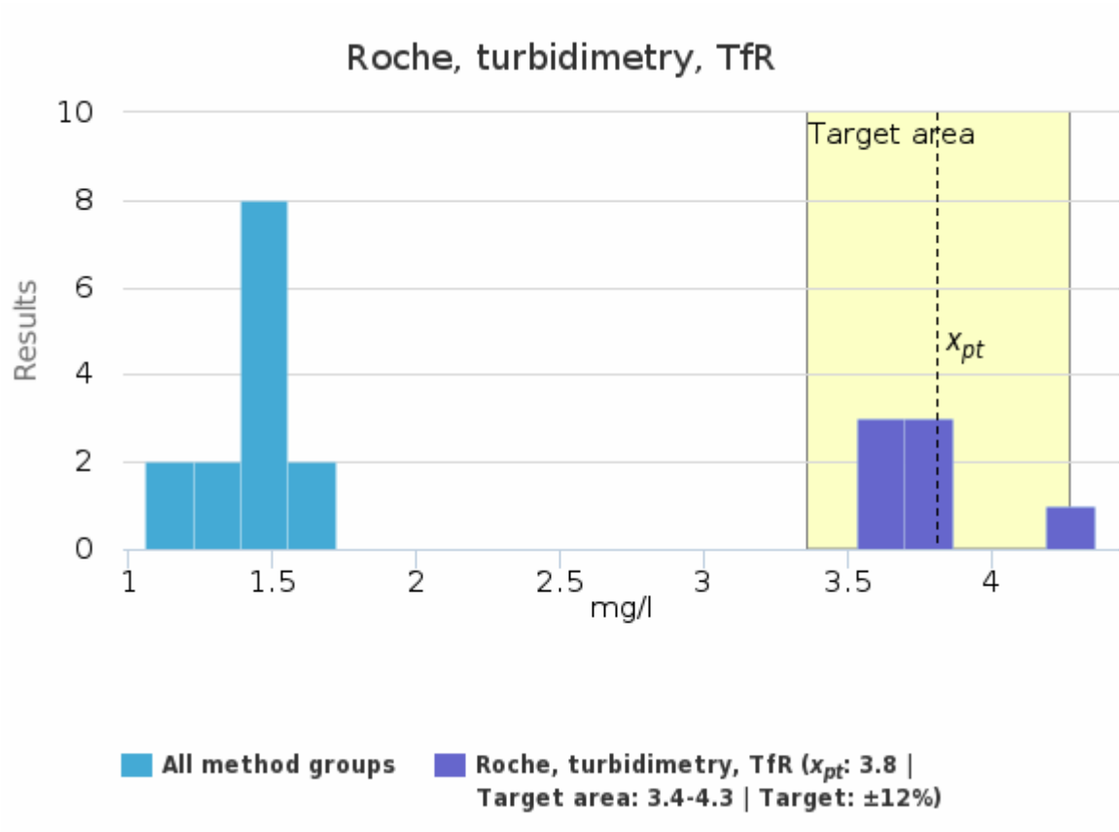


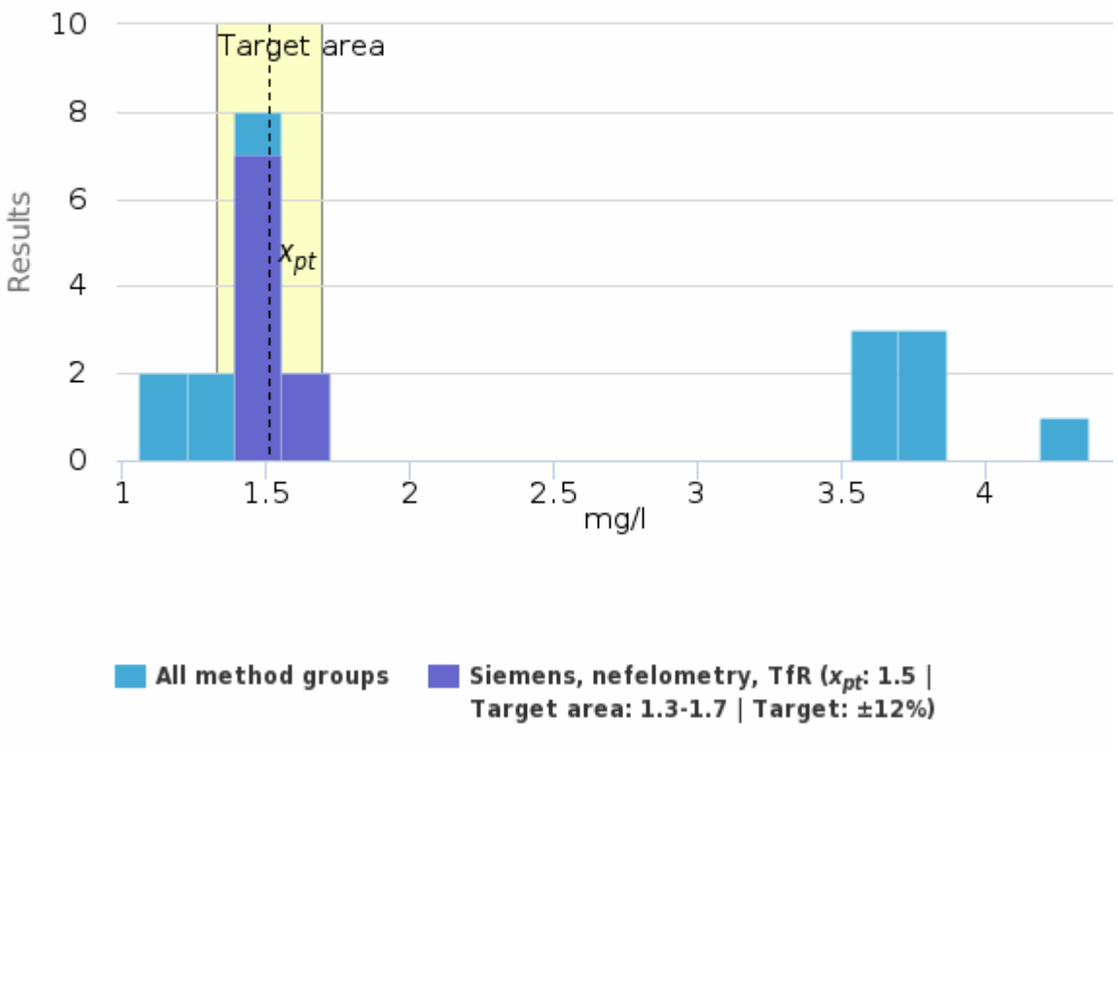
Specimen S002 | Transferrin receptor, mg/l

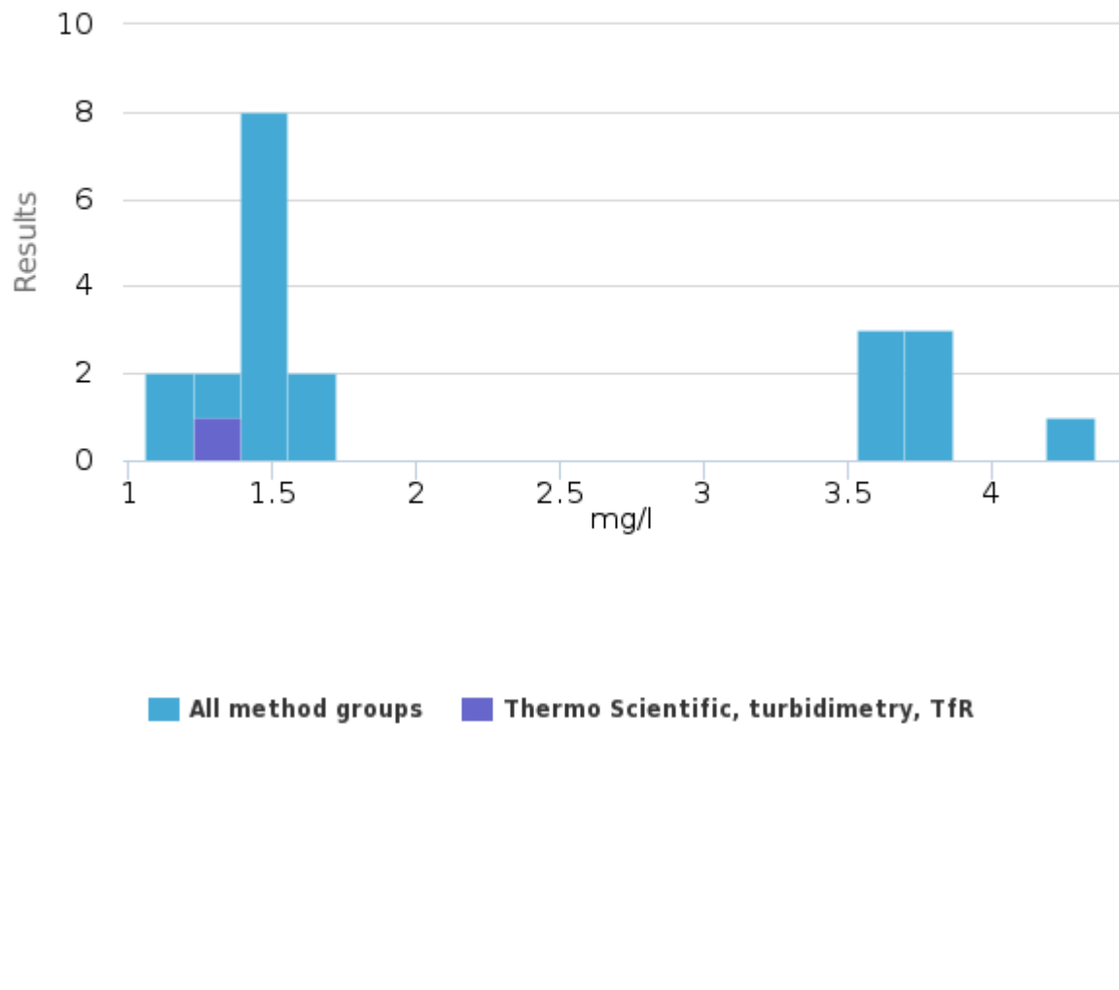
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Randox, turbidimetry, TfR	1.2	1.1	0.2	14.1	<0.1	1.1	1.3	-	3
Roche, turbidimetry, TfR	3.8	3.8	0.3	6.8	<0.1	3.6	4.4	-	7
Siemens, nefelometry, TfR	1.5	1.5	<0.1	3.0	<0.1	1.5	1.6	-	9
Thermo Scientific, turbidimetry, TfR	-	-	-	-	-	1.3	1.3	-	1
Trimero Diagnostics (TfR)	-	-	-	-	-	1.5	1.5	-	1
All	**2.2**	**1.5**	**1.2**	**52.8**	**0.3**	**1.1**	**4.4**	**-**	**21**

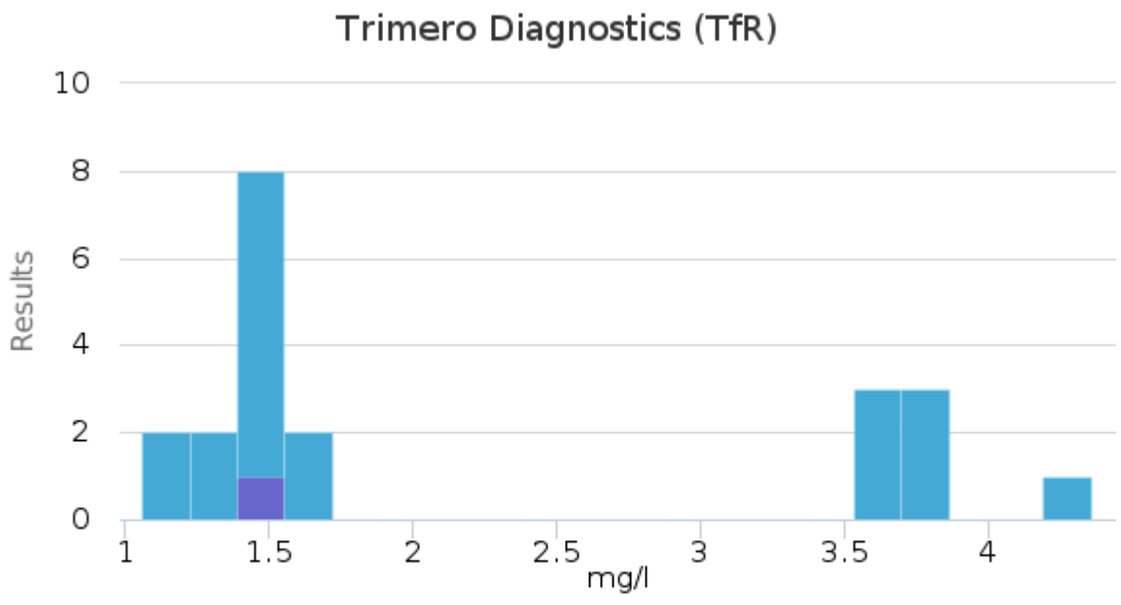
Specimen S002 | Transferrin receptor, mg/l| histogram summaries in LabScala







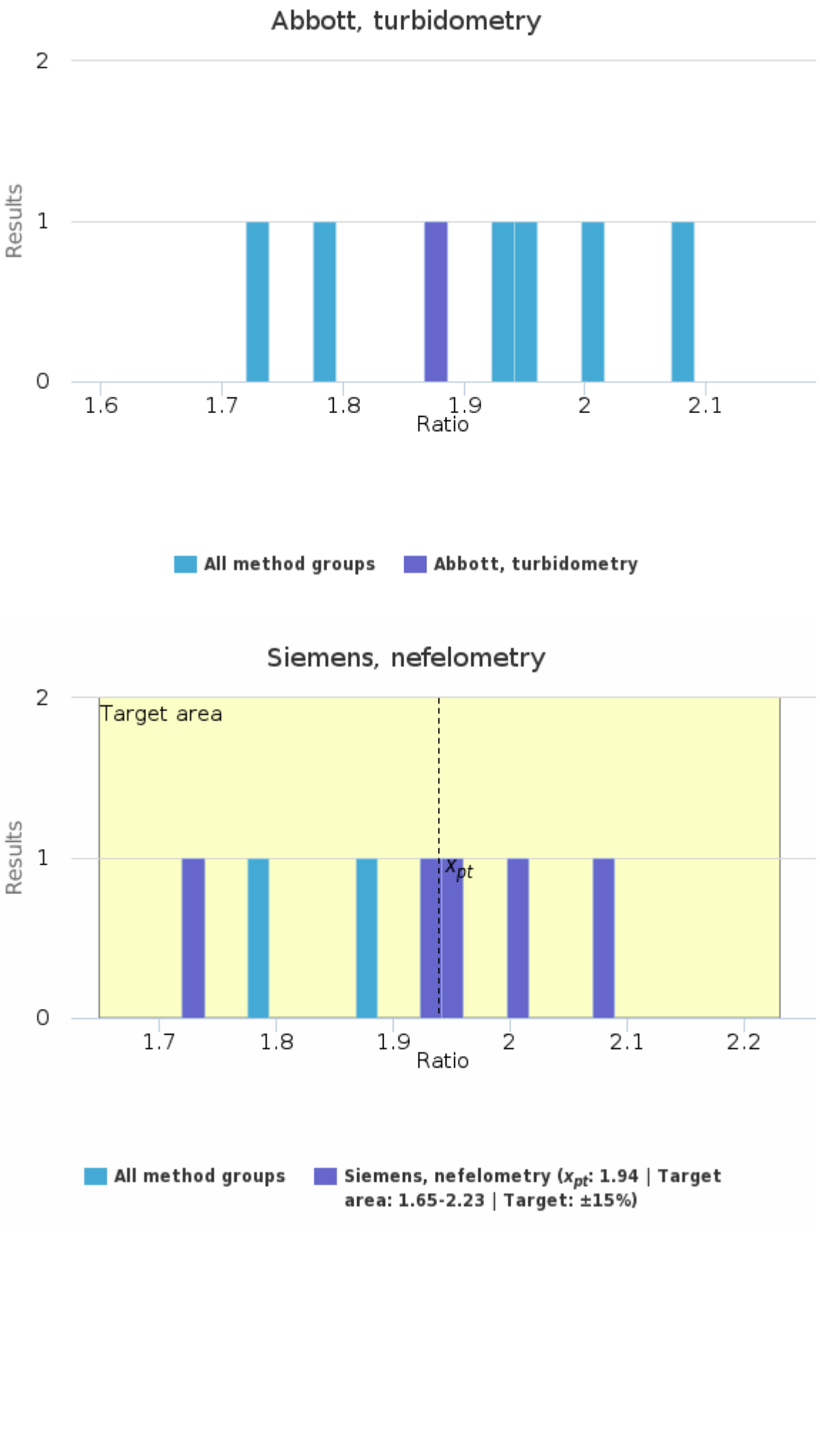


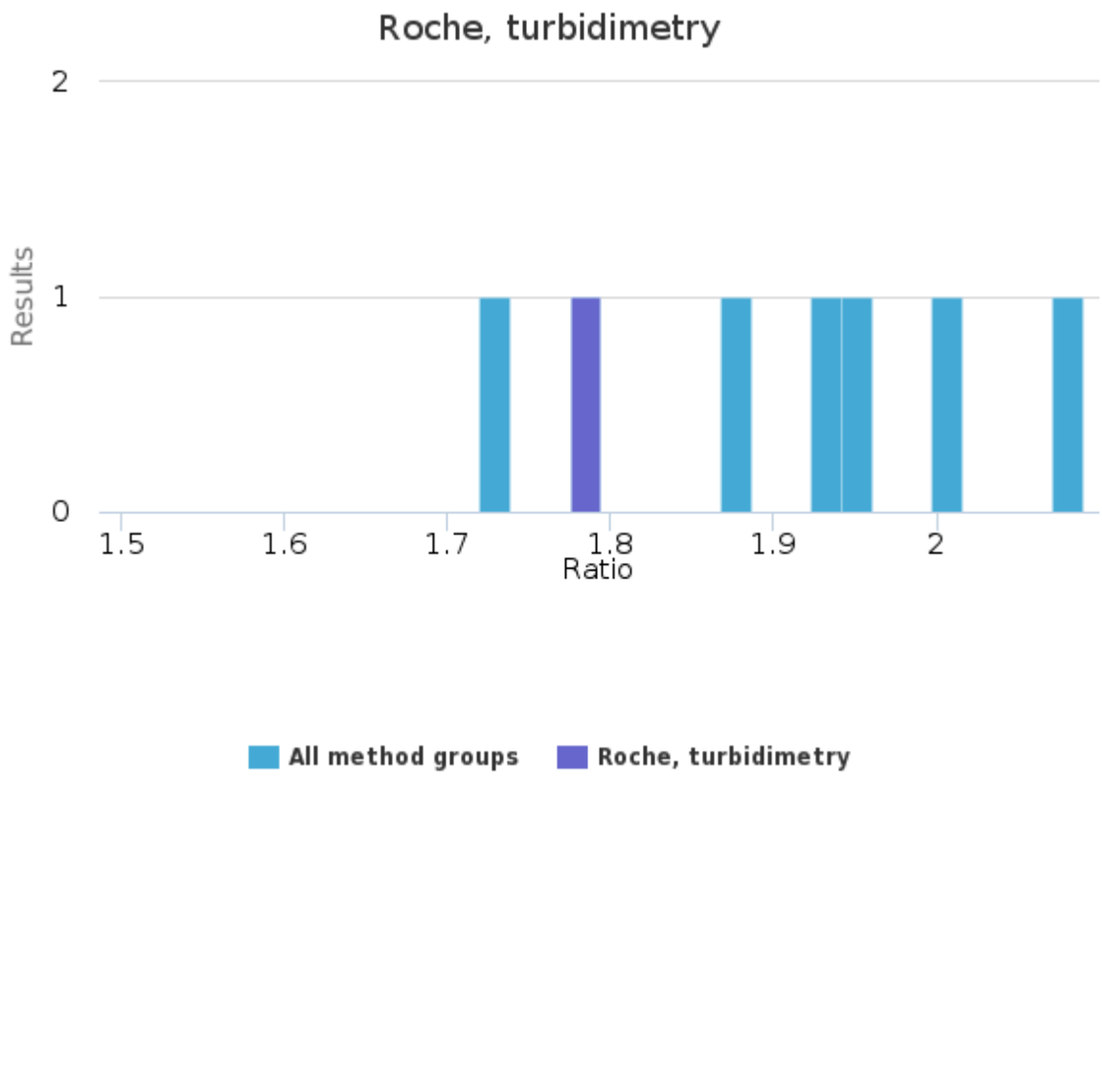


Specimen S002 | IgLCKappa/Lambda, total, Ratio

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Abbott, turbidometry	-	-	-	-	-	1.88	1.88	-	1
Roche, turbidimetry	-	-	-	-	-	1.78	1.78	-	1
Siemens, nefelometry	1.94	1.95	0.14	7.0	0.06	1.72	2.09	-	5
All	**1.91**	**1.94**	**0.13**	**6.7**	**0.05**	**1.72**	**2.09**	**-**	**7**

Specimen S002 | IgLCKappa/Lambda, total, Ratio| histogram summaries in LabScala

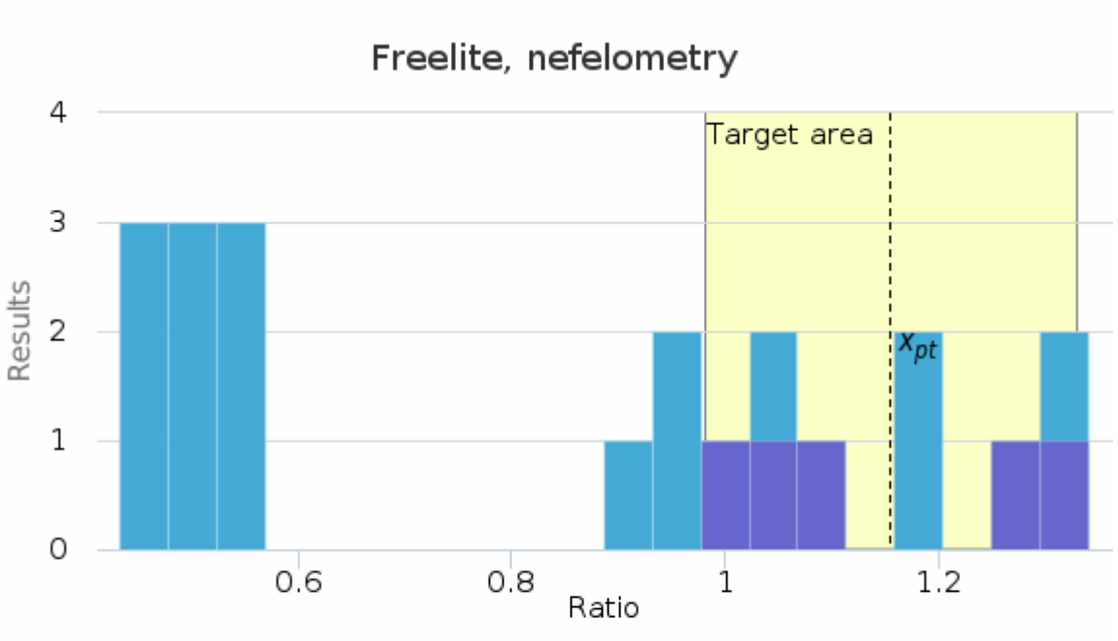


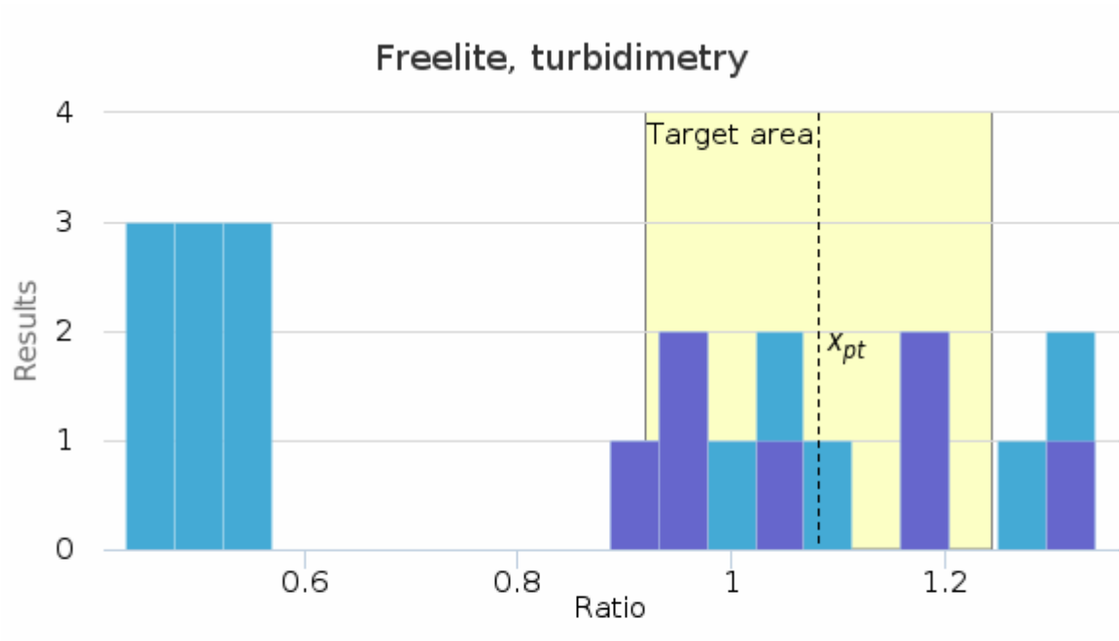


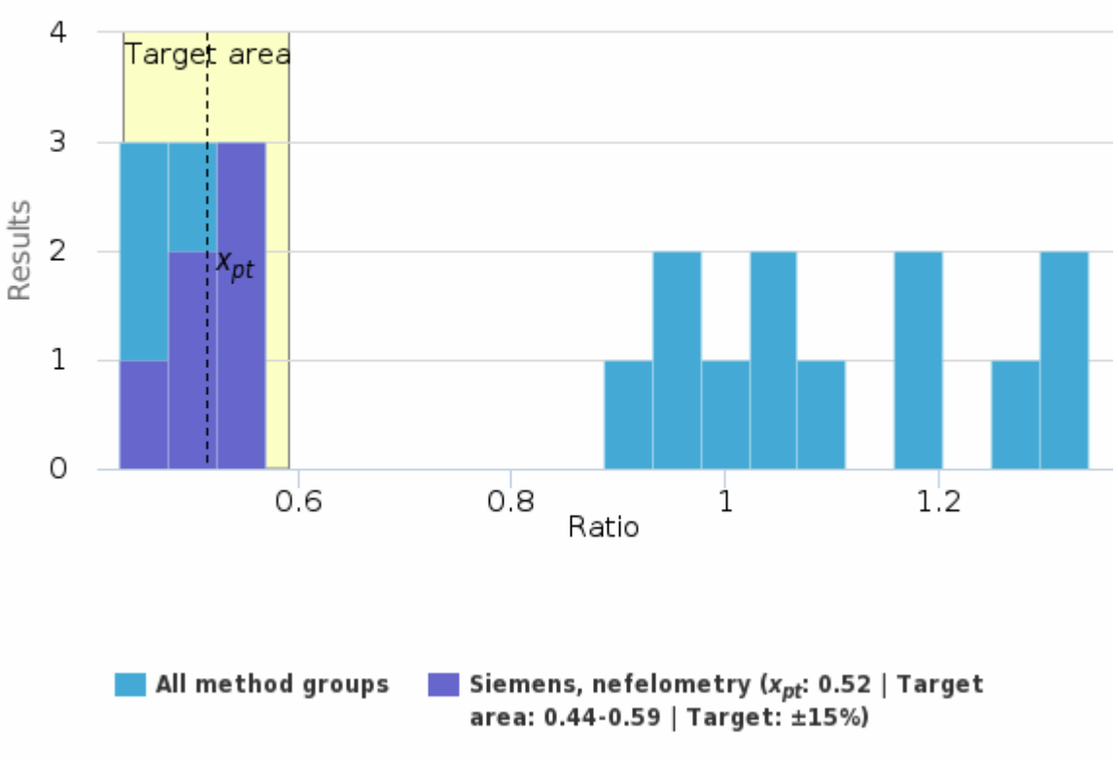
Specimen S002 | IgLCKappa/Lambda, free, Ratio

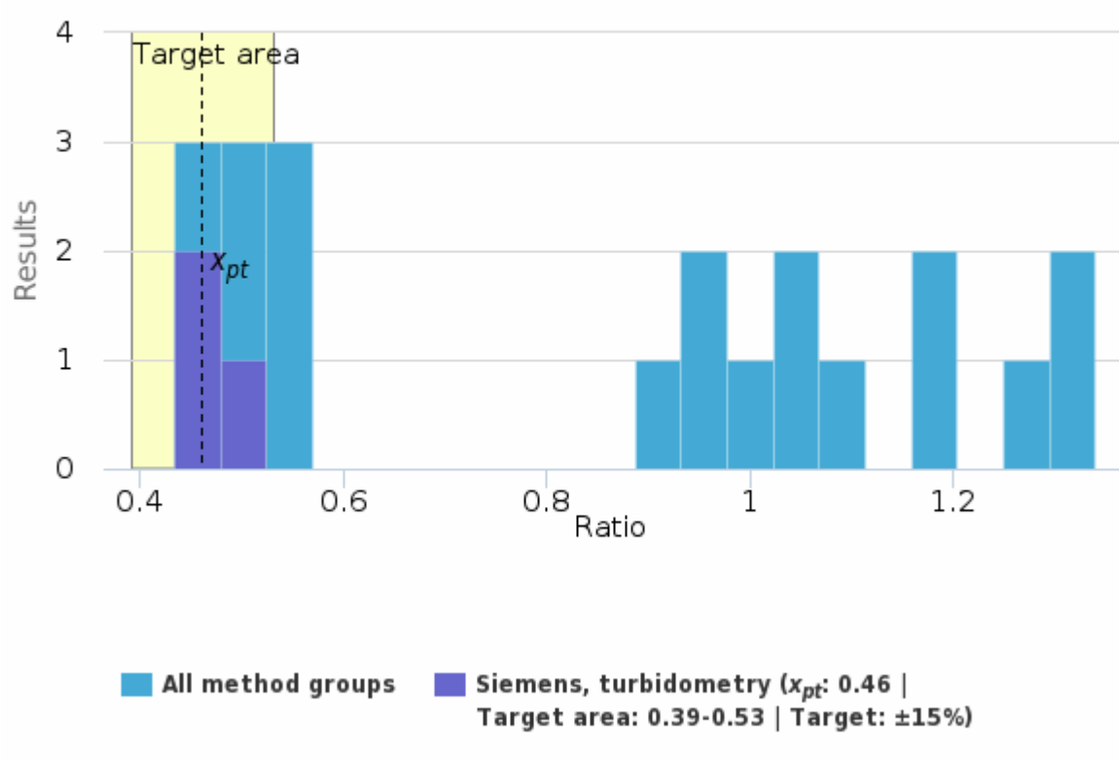
Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
Freelite, nefelometry	1.16	1.11	0.15	12.6	0.07	1.01	1.33	-	5
Freelite, turbidimetry	1.08	1.05	0.17	15.3	0.06	0.90	1.34	-	7
Siemens, nefelometry	0.52	0.52	0.04	7.1	0.01	0.45	0.56	-	6
Siemens, turbidometry	0.46	0.45	0.03	7.4	0.02	0.43	0.50	-	3
All	**0.85**	**0.94**	**0.33**	**39.3**	**0.07**	**0.43**	**1.34**	**-**	**21**

Specimen S002 | IgLCKappa/Lambda, free, Ratio| histogram summaries in LabScala









Report info

Participants

63 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

Proteins, Immunochemical Determinations Round 1, 2023

Specimens
Sample S001 (LQ735523011) and sample S002 (LQ735523012) were commercial liquid human serum samples.

Based on the previous tests and the results of this round, the samples are 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 histogram and Global report. 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
Albumin is divided into chemical and immunochemical groups, and other analytes into reagent manufacturer-specific turbidimetric and nephelometric groups. Nine results that differed from the other results were excluded from the result processing. We kindly ask customers to pay attention to result filling in Labscala, so that the selected unit for the analyte in LabScala is correct.

The distribution of results for ceruloplasmin is bimodal, with Roche's results being the lowest and Siemens' results being the highest in both samples. This is more visible in sample S001. Roche transferrin receptor results are 2-fold compared to Randox turbidometry, Siemens nephelometry, Thermo Scientific and Trimero Diagnostics results due to different standardizations.

End of report

2023-02-14

FINAL REPORT

Product no. 2230

Samples sent	2023-01-23
Round closed	2023-02-13
Report released	2023-02-14

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
Päivi Ranta
paivi.ranta@labquality.fi

Expert
Kari Åkerman, Petra Anttila
Seinäjoki Central Hospital, Finland

Labquality Oy
Kumpulantie 15
FI-00520 HELSINKI
Finland

Tel. + 358 9 8566 8200
Fax + 358 9 8566 8280

info@labquality.fi
www.labquality.com

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

Quality Management
ISO 9001:2015