Qualitätssicherung für
die NIRS/NIT-Analytik

VDLUFA

Auswertung VDLUFA-Ringversuch Silomais
NIRS-Methode 2019:
Report for VDLUFA Proficiency Test Forage Maize
NIRS method 2019:

Raps
Erbsen
Silomais
Grassilage
Maissilage
Braugerste
Backweizen

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Nur für den internen Gebrauch der Teilnehmer an diesem Ringversuch

Inhaltsverzeichnis

1 Abkürzungen / Abreviations

CV_r	Wiederholvariationskoefizient Coefficient of variation for repeatability
CV_R	Vergleichsvariationskoefizient Coefficient of variation for reproducibility
m	Mittelwert mean value
n	Einzelwerte single results
n_1	gültige Einzelwerte in der Auswertung valid single results in report
p	Labore im Ringversuch laboratories in proficiency test
p_1	gültige Labore in der Auswertung valid laboratories in report
r	Wiederholbarkeit (-grenze) repeatability (limit)
R	Vergleichbarkeit (-sgrenze) reproducibility (limit)
s_r	Wiederholstandardabweichung repeatability standard deviation
s_R	Vergleichsstandardabweichung reproducibility standard deviation
SD	Standardabweichung standard deviation
tol_{up}	obere Toleranzgrenze upper tolerance level
tol_{low}	untere Toleranzgrenze lower tolerance level
x_a	"Wahrer Wert" , (s. Kap. 2) "true value" , (s. chap. 2)
Δ	Differenz difference

2 Aufbau des Ringversuchs / Design of Proficiency Test

Material/Materials : 6 Proben/Samples: Silomais

		1901	1902	1903	1904	1905	1906
Trockenmasse / dry matter	[%]	90.74	89.75	91.36	91.68	91.29	91.49
Rohprotein / XP	[% TM]	5.57	6.27	5.99	6.31	5.73	6.09
Rohfaser / XF	[% TM]	24.73	17.66	18.82	19.20	19.50	18.82
Rohfett / XL	[% TM]	2.19	2.95	2.53	2.47	2.38	2.75
Stärke / XS	[% TM]	22.69	33.49	36.61	33.72	34.75	32.58
Zucker / XZ	[% TM]	5.25	7.48	4.81	5.45	5.66	8.35
aNDFom	[% TM]	55.58	41.63	42.67	45.25	43.57	42.76
ADFom	[% TM]	30.25	22.00	22.48	22.90	23.30	23.15
ADL	[% TM]	2.40	1.45	1.84	1.81	1.95	1.67
NDF	[% TM]	54.81	41.28	43.11	44.83	43.77	42.74
ADFom	[% TM]	32.34	22.58	24.18	24.49	24.96	23.58
Elos / Cellulase	[% TM]	57.98	71.26	68.01	67.52	66.54	68.97

Versand / Distribution : vorvermahlen als Pulver / *preground as powder*

Methoden / Methods : alle Merkmale / *all parameters* VDLUFA 31.3

Ringversuch / PT : mit 4 Wiederholungen je Labor
with 4 repeats per laboratory

Organisation : VDLUFA NIRS GmbH, Kassel

Zeitraum / Time frame : März-Mai 2019

Labore / Participating laboratories : (Kodierung: siehe individuelle Information
Codes: see individual information)

AG Fuko, Isernhagen
Agrartest, Aarbergen
BfUL, Nossen
BSA, Hannover
Caussade, Réclainville, F
Corteva, Buxtehude
Inst. Nuss, Bad Kissingen
IS Forschung, Wahlstedt
KWS, Einbeck
LELF, Paulinenaue
LfL, Fresing
LfL, Grub

LfLG, Bernburg
LHL, Kassel
Limagrain, Rilland, NL
LTZ Augustenberg, Karlsruhe
LUFA Nord-West, Oldenburg
LUFA NRW, Münster
LUFA Rostock, Rostock
Monsanto, Boissay, F
RAGT, Olemps, F
Staphyt, Blaufelden
Syngenta, Bad Salzuflen
TLLLR, Jena
Uni Gießen, Gießen
Uni Göttingen, Göttingen
Uni Hohenheim (350a), Stuttgart
VDLUFA NIRS, Kassel

Berechnungen / Calculations : Berechnung nach ISO 5725, Darstellung nach Pocklington
calculated accord. to ISO 5725, displayed accord. to Pocklington

Terminologie / Terminology : Gemäß ISO 5725 werden Einzelwerte als Ausreißer bestimmt, die nicht zu den übrigen Werten dieses Labors passen. (Typ A)

Ferner werden alle Werte eines Labors markiert, wenn der Labormittelwert dieses Labors statistisch signifikant von dem Mittelwert aller Labore abweicht (Typ B) oder die laborinterne Streuung erhöht ist (Typ C).

Bei allen drei Typen von Ausreißern wird unterschieden, ob diese Ausreißer signifikant auf dem 1%-Niveau sind (Typ A, B und C) — dann werden diese Messergebnisse aus der Auswertung herausgenommen — oder ob die Signifikanz nur auf dem 5%-Niveau gegeben ist (Typ a, b, und c) — dann werden diese Werte markiert und in der weiteren Berechnung berücksichtigt.

Entsprechend den Empfehlungen der "VDLUFA FG Futtermittel" werden C-Ausreißer nicht aus der Auswertung eliminiert (VDLUFA 2015).

D-Ausreißer werden per Hand, ohne statistische Berechnungen aus der Auswertung herausgenommen.

Die HORRAT-Zahl macht eine Aussage über die Güte des Ringversuchs. Dazu wird die Vergleichbarkeit relativ zum Mittelwert des Ringversuchs gesetzt und dann mit einer em-

pirischen Verteilung verglichen. Streng genommen gilt die HORRAT-Zahl nur für chemisch eindeutig definierte Parameter (d.h. nicht für Konventionsmethoden) und auch nicht bei Mengenbestandteilen.

Die z-Scores wurden nach DIN 38402-45 berechnet. Die Toleranzgrenzen wurden mit $m \pm 2 * s_R$ bzw. $x_a \pm 2 * s_R$ bestimmt, wenn ein "wahrer Wert" den Proben zu geordnet wurde.

According to ISO 5725 single values are marked as A outliers, if these single values don't fit to the remaining values of that laboratory (type A).

All values from a single laboratory are marked as outliers, if the laboratory mean does not fit the mean across all labs (type B) or if the the standard deviations between single labs in a laboratory is significantly increased (type C).

For all types of outliers the test is done on a significance level of 1% (type A, B, C) – the samples are removed from the report – and on the 5% level (type a, b, c) – the data are retrieved in the report.

According to a recommendation of "VDLUFA FG Futtermittel" no C outliers are removed from the report (VDLUFA 2015).

D outliers are removed by hand, without a statistical test from the report.

The HORRAT *value makes a statement about the quality of the proficiency test. The reproducibility is calculated as a fraction of the mean in the proficiency test and compared to a empirical distribution. The* HORRAT *value is only valid for chemically defined parameter (i.e. not for conventional methods) and not for major components.*

The z scores are calculated according to DIN 38402-45. The tolerance levels were calculated with $m \pm 2 * s_R$ *and* $x_a \pm 2 * s_R$*, if the samples were assigned a "true value".*

Verweise / Literature :

DIN 38402-45 (2003): Ringversuche zur externen Qualitätskontrolle von Laboratorien (A45). DEV zur Wasser-, Abwasser- und Schlammuntersuchung.

DIN ISO 13528 (2009): Statistische Verfahren für Eignungsprüfungen durch Ringversuche. Beuth-Verlag, B.

FAO (2015): Things to know about the ring text. FAO about the FAO-IAG Ring Text. Verfügbar unter: `http://www.`

fao.org/ag/againfo/home/documents/2015_AnnouncemenRing_test.pdf (abgerufen am 5. Mai 2020).

ISO 5725 (1994): Precision of Test Methods. ISO, Genf, CH.

Horwitz, W (1995): Protocol for the design, conduct and interpretation of method-performance studies. Pure & Appl Chem. 67(2)331-343.

Pocklington, W.D. (1991): Precision and accuracy of analysis: Standardisation of analytical methods. In: J.B. Rossell und J.L.R. Pritcharrd: Analysis of Oilseeds, Fats and Fatty Foods. Elsevier Science Publishers, Barking, UK. S. 1-38.

VDLUFA (2012): VDLUFA Methodenbuch Bd. III, Die chemische Untersuchung von Futtermitteln, VDLUFA-Verlag, Darmstadt.

VDLUFA ASR, Fachgruppe VI des VDLUFA: "Analysenspielräume zur Futtermitteluntersuchung". Version 10 (2016). Verfügbar unter: http://vdlufa.de/joomla/Dokumente/Fachgruppen/FG6/VI-O-41_Fortsetzung_neue_ASR_FGVI_Version_01_07_2016.pdf (abgerufen am 1. Juli 2016).

3 Vorbemerkung zu den im Ringversuch genutzten Geräten / Remark on the Instruments used in this Proficiency test

Die Labore 8, 22, 30, 36 und 134 nutzten für den Ringversuch ein Bruker MPA-Gerät, die Labor2 16 und 20 ein Foss XDS-Gerät, das Labor 37 ein Foss DS2500-Gerät, die Labore 3, 29, 32 und 33 Unity Scientific SpectraStar-Geräte, die Labore 34, 38 und 106 nutzen ein ITG M5-Gerät, das Labor 39 zwei Perten FT 9700-Geräte. Die anderen Geräte waren Foss NIRSystems-Geräte.

Alle Geräte nutzten eine gemeinsame Kalibrierung und eine gerätespezifische Kalibrierung (alles im ISI-Format).

The labs 8, 22, 30, 36 and 134 used a Bruker MPA, the labs 16 and 20 a Foss XDS, the lab 37 a Foss DS2500, the labs 3, 29, 32 and 33 used Unity Scientific SpectraStar and labs 34, 38 and 106 an ITG M5 instruments, lab 39 used two Perten FT-9700 instruments. The remaining instruments are Foss NIRSystems instruments.

All instruments used a uniform calibration model and an instrument specific standardisation file (all in ISI format).

4 Kriterien für die Laborbeurteilung / Criteria for proficiency test

Zur Berechnung der z-Werte wurde die folgenden Vergleichbarkeiten herangezogen. Als Grenzwerte gelten bei der Laborbeurteilung für bestanden:

$$-2 <= \text{z-Wert} <= 2$$

Für die Laborbeurteilung wurde ein dreistufige Skala gewählt (FAO 2015):

bestanden (grün): $-2 <=$ z-Wert $<= 2$
fragwürdig (orange): $-3 <=$ z-Wert $<= 3$
durchgefallen (rot): z-Wert < -3 oder z-Wert > 3

For calculation of the z scores the following reproducibilities were used. The limits for a successfull participatin in the proficiency test is:

$$-2 <= \textit{z score} <= 2$$

For lab evaluation a three stage scale was used (FAO 2015):

passed (green): $-2 <=$ *z score* $<= 2$
questionable (orange): $-3 <=$ *z score* $<= 3$
failed (red): z score < -3 *or z score* > 3

Pos.	Merkmal Constituent	s_R	Einheit Unit	Quelle Source
2	Rohprotein / XP	0.25	% TM	VDLUFA ASR
3	Rohfaser / XF	1	% TM	VDLUFA ASR
4	Rohfett / XL	0.3	% TM	VDLUFA ASR
5	Stärke / XS	2	% TM	VDLUFA ASR
6	Zucker / XZ	0.5	% TM	VDLUFA ASR
7	aNDFom	1.75	% TM	VDLUFA ASR
8	ADFom	1.1	% TM	VDLUFA ASR
10	NDF	1.75	% TM	VDLUFA ASR
11	ADFom	1.1	% TM	VDLUFA ASR
12	Elos / Cellulase	1.75	% TM	VDLUFA ASR

Falls in der obigen Tabelle kein Eintrag zu einem Merkmal gemacht wurde, wurde zur Berechnung der z-Werte die Vergleichbarkeit, wie sie in in diesem Ringversuch je Probe bestimmt worden ist, herangezogen.

In case of no entry in the above table for a constituent for calculation of the z scores the reproducibility as determined in this ring test for each sample individually was used.

5 Zusammenfassung der Laborbeurteilung / Summary of proficiency test

Die Beurteilung in der folgenden Tabelle, ob für eine Probe und ein Merkmal der Ringversuch bestanden wurde, richtet sich nach den Kriterien zum z-Wert im vorigen Abschnitt.

The criterium in the next table whether a lab was successful for a single sample was given in the previous section.

Labor	*Trockenmasse / dry matter*	*Rohprotein / XP*	*Rohfaser / XF*	*Rohfett / XL*	*Stärke / XS*	*Zucker / XZ*	*aNDFom*	*ADFom*	*ADL*	*NDF*	*ADFom*	*Elos / Cellulase*
1	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
3	6 / 6	2 / 6	6 / 6	6 / 6	5 / 6	4 / 6	5 / 6	5 / 6	6 / 6	6 / 6	6 / 6	5 / 6
5	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
7	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
8	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
9	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
10	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
14	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6
15	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
16	6 / 6	6 / 6	3 / 6	6 / 6	3 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	5 / 6	6 / 6
17	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
18	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
19	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
20	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
22	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	0 / 6	6 / 6	5 / 6	0 / 6	6 / 6	6 / 6
23	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
24	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
25	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
26	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
27	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
29	5 / 6	6 / 6	6 / 6	6 / 6	4 / 6	6 / 6	6 / 6	4 / 6	6 / 6	6 / 6	6 / 6	4 / 6
30	4 / 4	4 / 4	3 / 4	4 / 4	2 / 4	4 / 4	0 / 4	3 / 4	4 / 4	1 / 4	3 / 4	4 / 4
31	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6
32	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	1 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
33	6 / 6	0 / 6	5 / 6	5 / 6	2 / 6	1 / 6	2 / 6	6 / 6	0 / 6	6 / 6	4 / 6	0 / 6
34	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	4 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
35	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
36	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
37	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	4 / 6	5 / 6	1 / 6	5 / 6	5 / 6	4 / 6
38	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	4 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
39	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	4 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
106	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	0 / 6	6 / 6	5 / 6	6 / 6	5 / 6	4 / 6	6 / 6
134	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	0 / 6	6 / 6	6 / 6	0 / 6	3 / 6	6 / 6
139	6 / 6	4 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6

In der vorigen Tabelle sind die Analysen der verschiedenen Labore als "bestandene Proben von allen Proben" (bestanden/alle) angegeben. Wenn alle Proben bestanden sind, wird das Feld für dieses Labor für dieses Merkmal grün hinterlegt. Wenn mindestens 80% aller Proben bestanden sind (VDLUFA 2015), gelb, wenn weniger bestanden sind, rot hinterlegt.

In the previous table the analyses of each lab is described as "successful samples of all samples" (successfull/all). If all samples are analysed successfully, the color for this lab and constituent is marked green. If at least 80% of all samples are analysed successfully (VDLUFA 2015), yellow, if less, the cell is marked red.

6 Merkmal / Constituent: Trockenmasse / dry matter

Einheit / Unit: %

6.1 Anmerkungen / Annotations

6.2 Laborbeurteilung / Proficiency Test

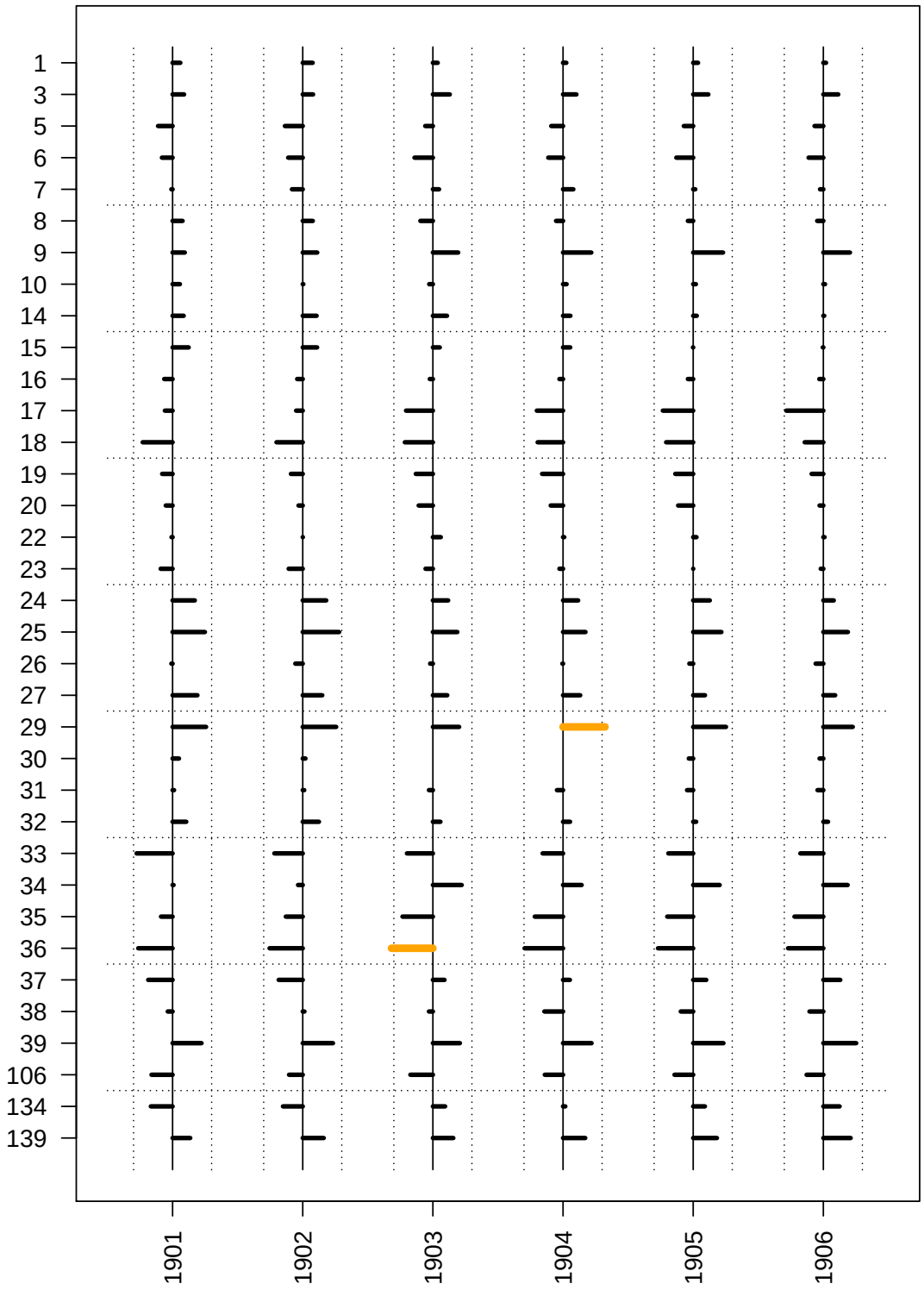
In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wird die Vergleichbarkeit, wie sie in in diesem Ringversuch bestimmt worden ist, herangezogen.

For calculation of the z scores the reproducibility as determined in this ring test was used

Trockenmasse / dry matter

z-Werte / z Scores



Trockenmasse / dry matter

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Trockenmasse / dry matter

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	91.05	0.31	90.14	0.39	91.56	0.20	91.83	0.15	91.51	0.22	91.62	0.13		
3	91.20	0.46	90.16	0.41	92.05	0.69	92.30	0.62	91.98	0.69	92.21	0.72		
5	90.16	-0.58	89.05	-0.70	91.05	-0.31	91.14	-0.54	90.87	-0.43	91.06	-0.43		
6	90.32	-0.42	89.18	-0.57	90.61	-0.75	91.00	-0.68	90.53	-0.77	90.78	-0.71		
7	90.69	-0.05	89.33	-0.42	91.61	0.25	92.16	0.47	91.39	0.09	91.33	-0.16		
8	91.14	0.40	90.15	0.40	90.85	-0.51	91.36	-0.32	91.05	-0.24	91.19	-0.30		
9	91.23	0.49	90.32	0.57	92.40	1.04	92.99	1.31	92.65	1.36	92.78	1.29		
10	91.03	0.29	89.77	0.02	91.21	-0.15	91.84	0.16	91.42	0.12	91.57	0.08		
14	91.18	0.44	90.30	0.55	91.94	0.58	92.02	0.34	91.46	0.16	91.53	0.04		
15	91.38	0.64	90.32	0.57	91.64	0.28	92.01	0.33	91.29	-0.01	91.47	-0.03		
16	90.41	-0.33	89.53	-0.22	91.23	-0.13	91.51	-0.17	91.05	-0.24	91.30	-0.19		
17	90.43	-0.31	89.49	-0.26	90.26	-1.10	90.47	-1.21	89.91	-1.38	89.70	-1.79		
18	89.55	-1.19	88.72	-1.03	90.21	-1.15	90.51	-1.17	90.06	-1.23	90.59	-0.90		
19	90.32	-0.42	89.29	-0.47	90.66	-0.70	90.71	-0.97	90.48	-0.81	90.92	-0.57		
20	90.47	-0.27	89.58	-0.17	90.78	-0.58	91.11	-0.57	90.61	-0.68	91.31	-0.18		
22	90.70	-0.04	89.75	0.00	91.68	0.32	91.74	0.05	91.44	0.15	91.55	0.06		
23	90.27	-0.47	89.20	-0.55	91.06	-0.30	91.51	-0.17	91.30	0.00	91.37	-0.13		
24	91.62	0.88	90.68	0.93	91.99	0.62	92.38	0.70	92.05	0.75	91.99	0.50		
25	92.03	1.29	91.18	1.43	92.36	1.00	92.72	1.04	92.58	1.28	92.68	1.19		
26	90.69	-0.05	89.46	-0.29	91.25	-0.11	91.65	-0.03	91.12	-0.17	91.12	-0.37		
27	91.73	0.99	90.52	0.77	91.95	0.59	92.47	0.79	91.83	0.54	92.06	0.57		
29	92.07	1.33	91.07	1.32	92.43	1.07	93.62	1.94	92.79	1.49	92.91	1.42		
30	90.99	0.25	89.86	0.11					91.09	-0.20	91.31	-0.18		
31	90.80	0.06	89.81	0.06	91.20	-0.16	91.40	-0.28	91.02	-0.28	91.21	-0.28		
32	91.28	0.54	90.39	0.64	91.67	0.31	92.01	0.32	91.43	0.13	91.72	0.22		
33	89.31	-1.43	88.63	-1.12	90.30	-1.06	90.74	-0.94	90.17	-1.13	90.38	-1.11		
34	90.78	0.04	89.57	-0.18	92.54	1.18	92.54	0.86	92.50	1.21	92.66	1.17		
35	90.28	-0.46	89.08	-0.67	90.11	-1.25	90.37	-1.31	90.11	-1.18	90.09	-1.40		
36	89.37	-1.37	88.44	-1.31	89.66	-1.70	89.90	-1.78	89.69	-1.60	89.78	-1.71		
37	89.77	-0.97	88.80	-0.95	91.84	0.48	92.00	0.31	91.89	0.59	92.31	0.82		
38	90.55	-0.19	89.82	0.07	91.20	-0.16	90.82	-0.86	90.73	-0.57	90.82	-0.67		
39	91.89	1.15	90.94	1.19	92.47	1.11	93.00	1.32	92.67	1.38	93.08	1.59		
106	89.90	-0.84	89.21	-0.54	90.44	-0.92	90.84	-0.84	90.44	-0.85	90.68	-0.81		
134	89.87	-0.87	88.97	-0.78	91.86	0.50	91.78	0.10	91.83	0.53	92.28	0.79		
139	91.44	0.70	90.58	0.83	92.20	0.84	92.71	1.03	92.37	1.08	92.81	1.32		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

6.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906
n	154	158	150	149	154	154
p	35	35	34	34	35	35
n_1	154	158	150	149	154	154
p_1	35	35	34	34	35	35
m	90.74	89.75	91.36	91.68	91.29	91.49
s_r	0.25	0.17	0.19	0.22	0.20	0.21
CV_r	0.27	0.19	0.21	0.24	0.22	0.23
r	0.69	0.49	0.55	0.62	0.57	0.61
s_R	0.78	0.77	0.80	0.90	0.89	0.94
CV_R	0.86	0.86	0.88	0.98	0.97	1.03
R	2.20	2.18	2.26	2.55	2.51	2.67
HORRAT[1]	0.42	0.42	0.43	0.48	0.48	0.51

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

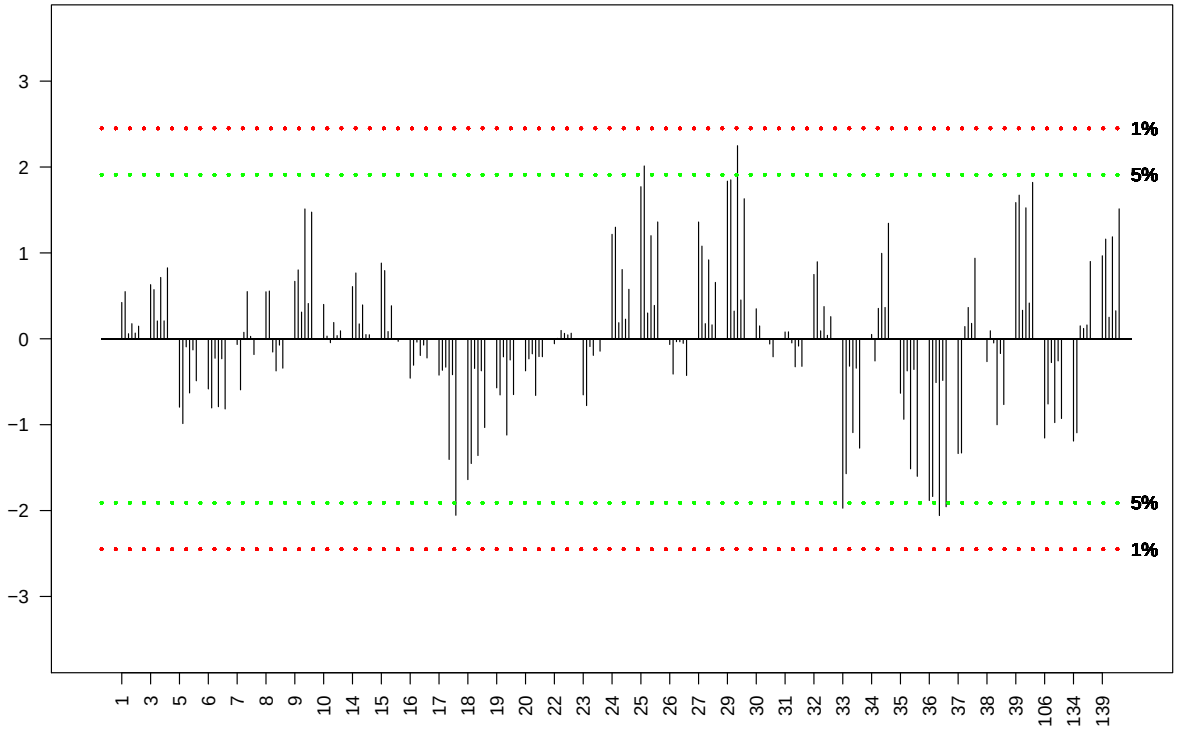
In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Trockenmasse / dry matter

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7						
8			c			
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26						
27						
29					C	
30						
31						
32			C			
33						
34						
35						
36						
37						
38						
39	c					
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

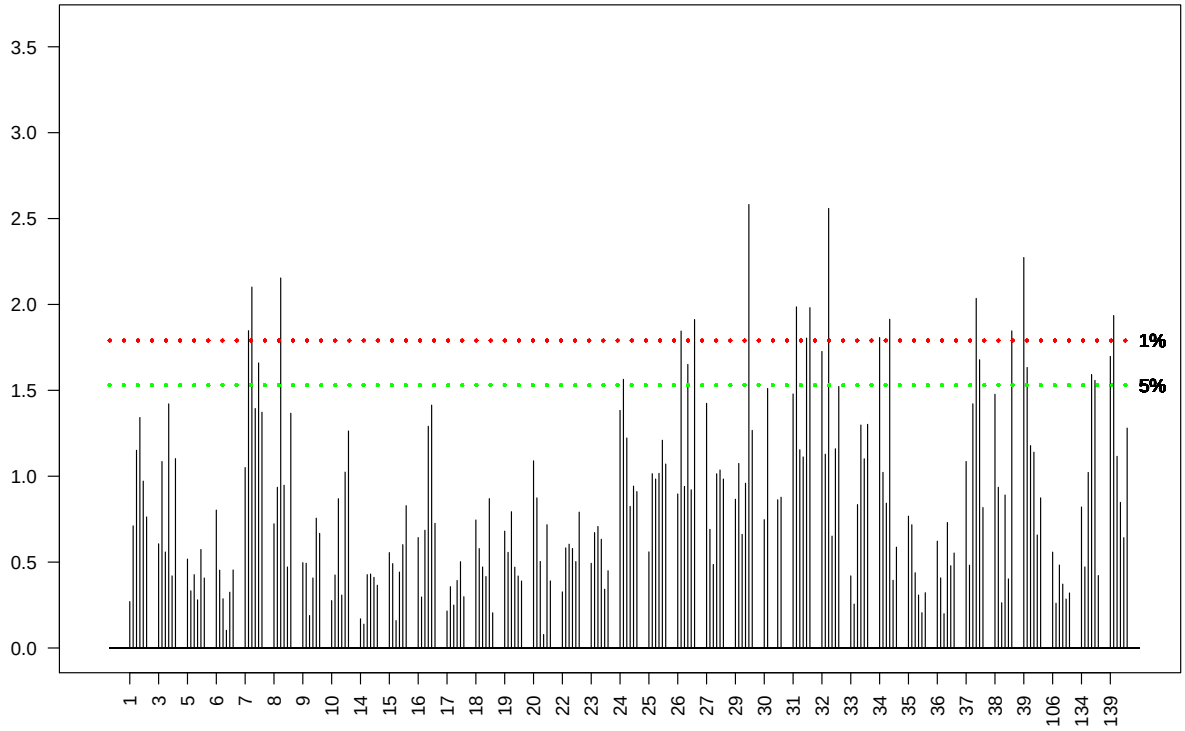
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

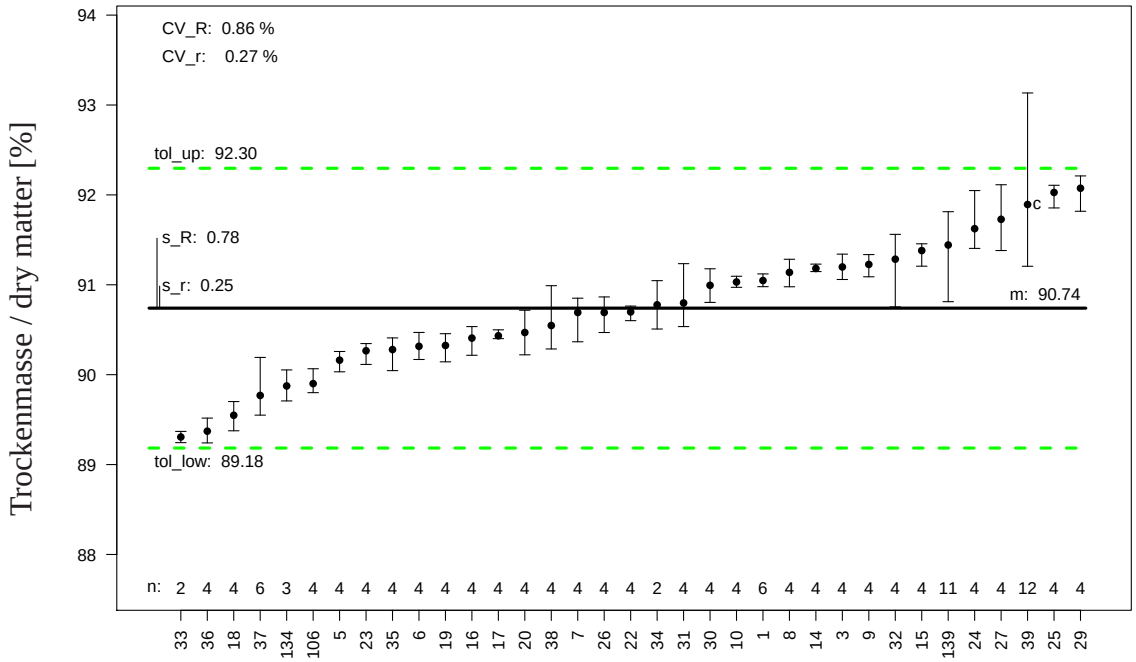
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

6.4 Einzelproben / Single Samples

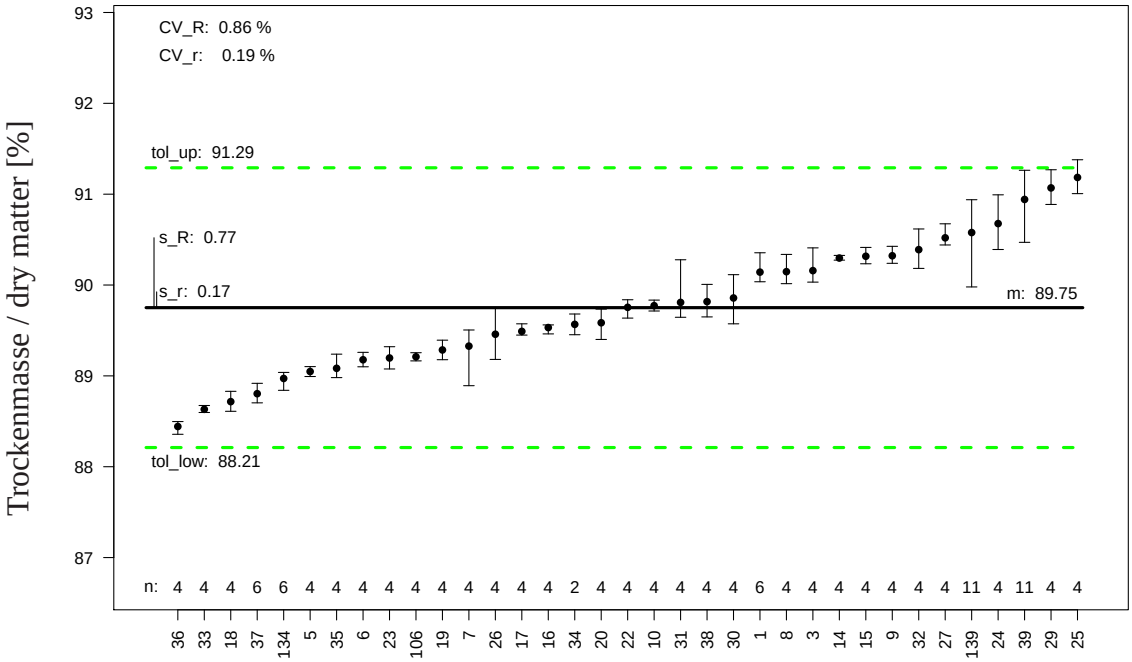
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

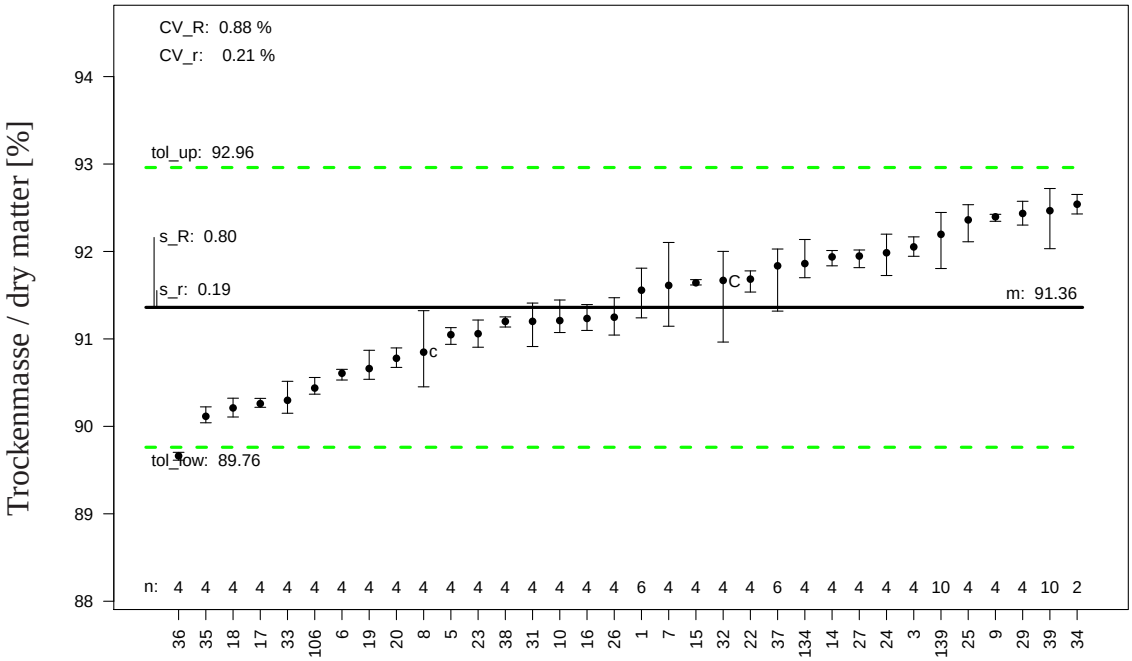
Probe/Sample 1901:



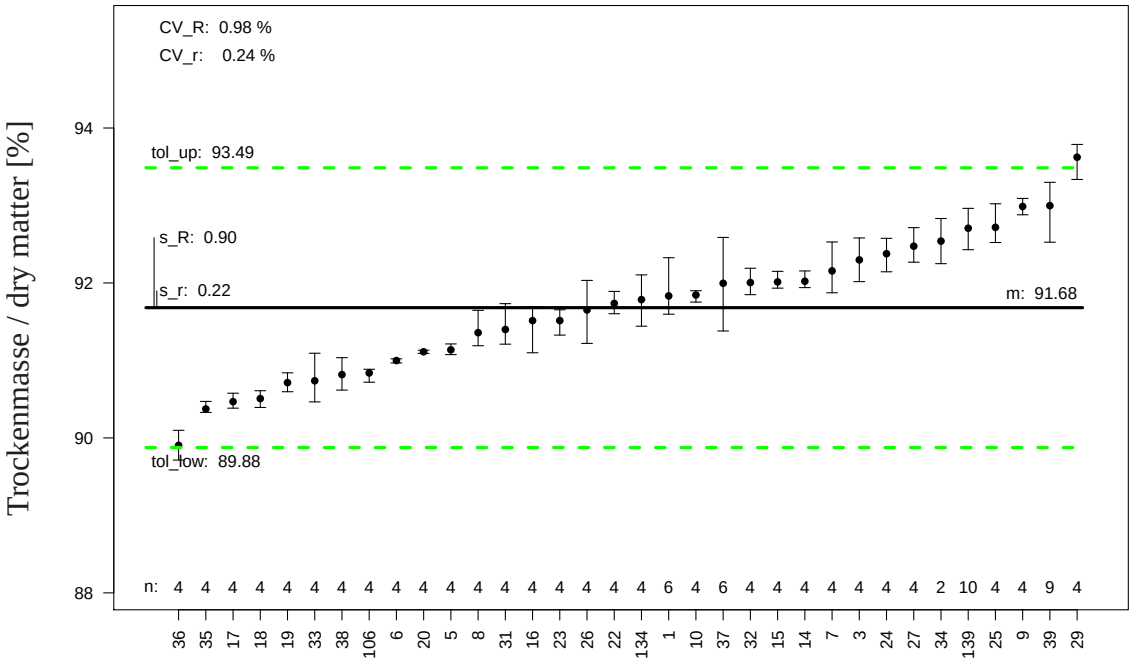
Probe/Sample 1902:



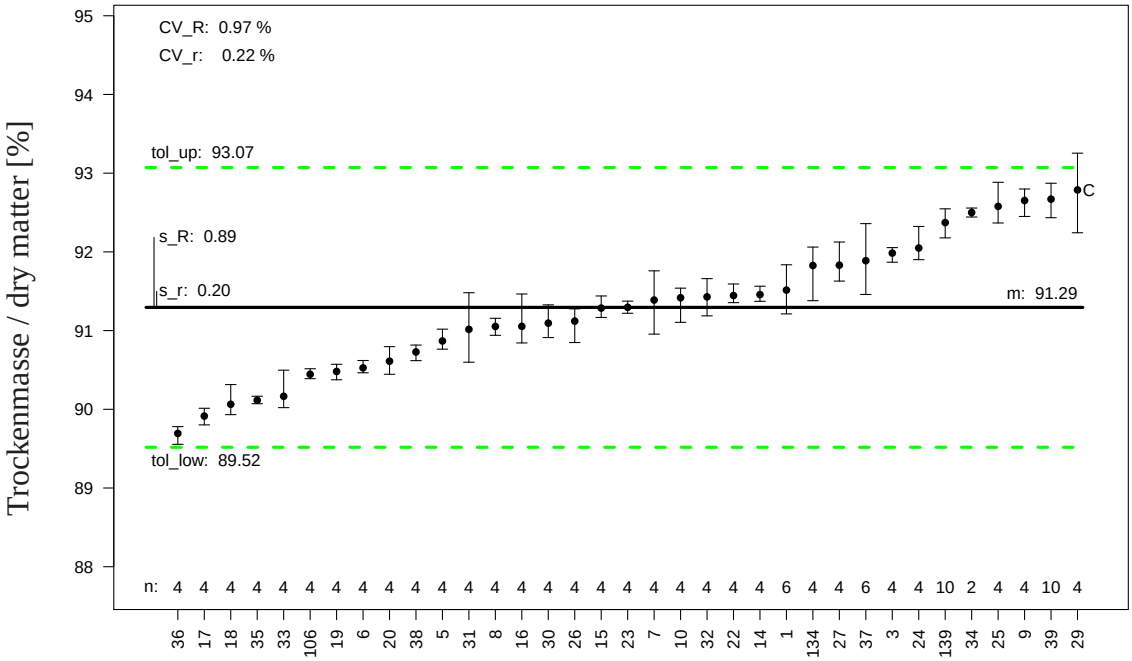
Probe/Sample 1903:



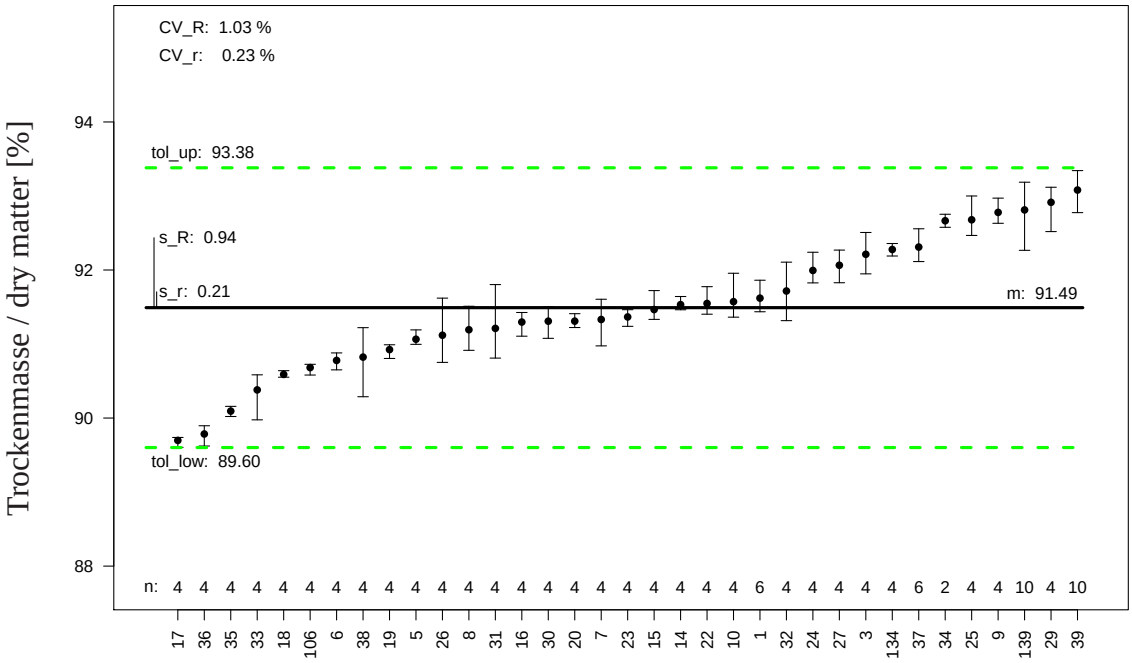
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



7 Merkmal / Constituent: Rohprotein / XP

Einheit / Unit: % TM

7.1 Anmerkungen / Annotations

7.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

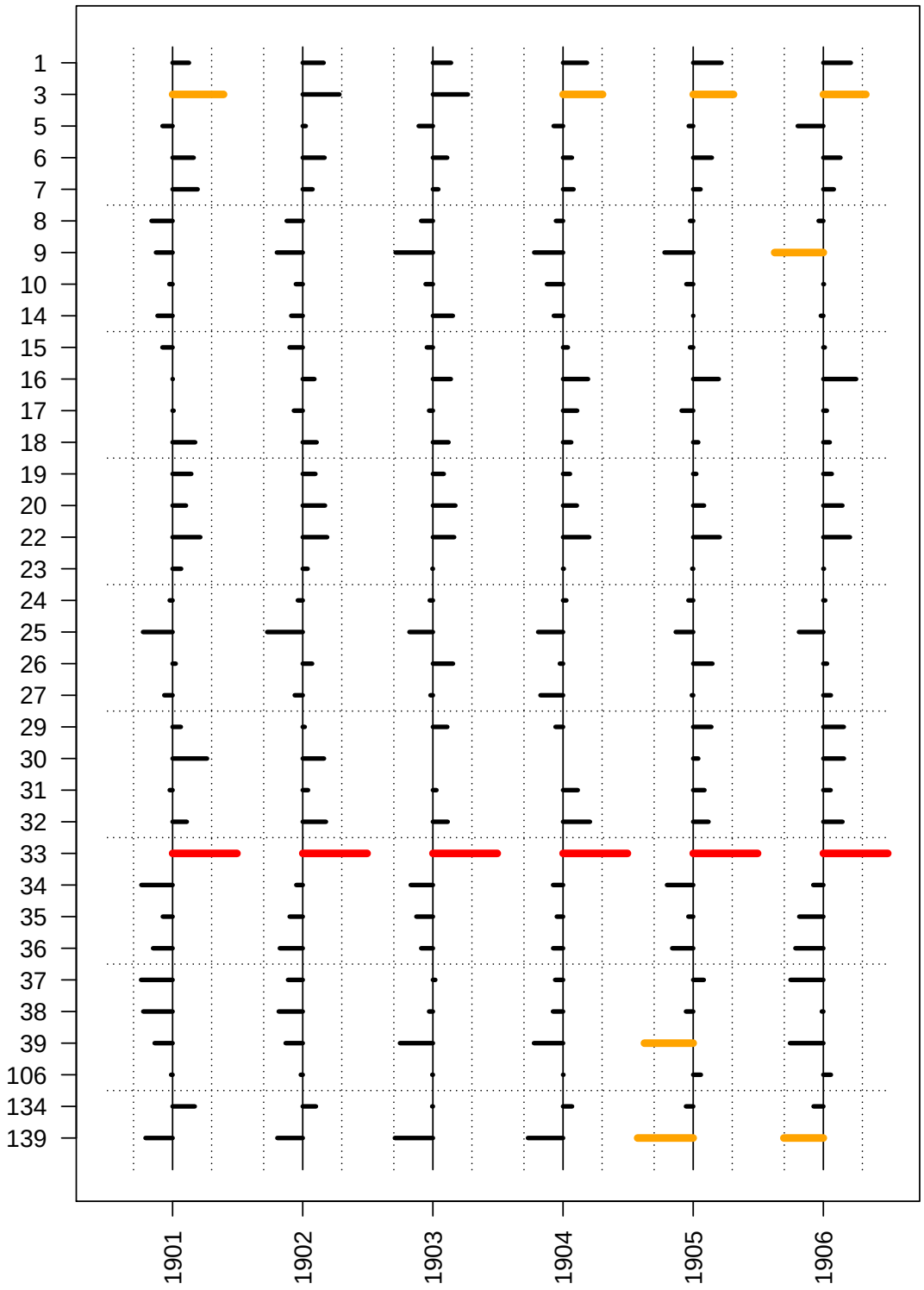
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 0.25 % TM

Quelle / Source: VDLUFA ASR

Rohprotein / XP

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Rohprotein / XP

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	5.74	0.21	6.50	0.27	6.18	0.23	6.58	0.31	6.05	0.36	6.40	0.35		
3	6.19	0.65	6.70	0.47	6.40	0.45	6.78	0.51	6.21	0.52	6.59	0.54		
5	5.40	-0.13	6.27	0.04	5.77	-0.18	6.15	-0.12	5.63	-0.06	5.72	-0.33		
6	5.80	0.27	6.51	0.28	6.13	0.18	6.38	0.11	5.93	0.24	6.27	0.22		
7	5.85	0.32	6.36	0.13	6.02	0.07	6.40	0.13	5.78	0.09	6.18	0.13		
8	5.26	-0.27	6.02	-0.21	5.80	-0.15	6.18	-0.09	5.65	-0.04	5.99	-0.06		
9	5.32	-0.21	5.90	-0.33	5.47	-0.48	5.90	-0.37	5.32	-0.37	5.42	-0.62		
10	5.49	-0.04	6.14	-0.09	5.86	-0.09	6.06	-0.21	5.60	-0.09	6.06	0.01		
14	5.34	-0.19	6.08	-0.15	6.21	0.26	6.15	-0.12	5.69	0.00	6.02	-0.03		
15	5.40	-0.13	6.06	-0.17	5.87	-0.08	6.33	0.06	5.65	-0.04	6.07	0.02		
16	5.54	0.00	6.38	0.15	6.18	0.23	6.59	0.32	6.02	0.33	6.47	0.42		
17	5.55	0.01	6.12	-0.11	5.90	-0.05	6.45	0.18	5.54	-0.15	6.09	0.04		
18	5.82	0.29	6.41	0.18	6.15	0.20	6.37	0.10	5.75	0.06	6.13	0.08		
19	5.77	0.24	6.39	0.16	6.09	0.14	6.36	0.09	5.73	0.04	6.16	0.11		
20	5.71	0.17	6.52	0.29	6.24	0.29	6.45	0.18	5.83	0.14	6.29	0.24		
22	5.89	0.35	6.54	0.31	6.22	0.27	6.60	0.34	6.03	0.34	6.39	0.34		
23	5.64	0.11	6.29	0.06	5.94	-0.01	6.28	0.01	5.68	-0.01	6.06	0.01		
24	5.50	-0.04	6.17	-0.06	5.91	-0.04	6.31	0.04	5.63	-0.06	6.07	0.02		
25	5.16	-0.38	5.77	-0.46	5.65	-0.30	5.95	-0.32	5.46	-0.22	5.74	-0.31		
26	5.57	0.04	6.35	0.12	6.21	0.26	6.23	-0.04	5.94	0.25	6.10	0.05		
27	5.43	-0.11	6.13	-0.10	5.92	-0.03	5.98	-0.29	5.67	-0.02	6.14	0.10		
29	5.64	0.11	6.26	0.03	6.13	0.18	6.17	-0.10	5.92	0.23	6.31	0.26		
30	5.97	0.44	6.50	0.27					5.75	0.06	6.31	0.26		
31	5.50	-0.04	6.30	0.07	6.00	0.05	6.46	0.19	5.83	0.14	6.14	0.09		
32	5.72	0.18	6.53	0.30	6.14	0.19	6.61	0.34	5.88	0.20	6.29	0.24		
33	6.88	1.34	7.52	1.29	7.30	1.35	7.56	1.29	7.10	1.41	7.33	1.28		
34	5.13	-0.40	6.15	-0.08	5.67	-0.28	6.14	-0.13	5.35	-0.34	5.92	-0.13		
35	5.41	-0.13	6.06	-0.17	5.74	-0.21	6.19	-0.08	5.63	-0.06	5.74	-0.31		
36	5.28	-0.25	5.94	-0.29	5.80	-0.15	6.14	-0.13	5.42	-0.27	5.69	-0.36		
37	5.13	-0.40	6.04	-0.19	5.98	0.03	6.17	-0.10	5.82	0.14	5.63	-0.42		
38	5.16	-0.38	5.92	-0.31	5.90	-0.05	6.14	-0.13	5.60	-0.09	6.03	-0.02		
39	5.30	-0.23	6.01	-0.22	5.53	-0.42	5.90	-0.37	5.06	-0.62	5.62	-0.43		
106	5.52	-0.02	6.20	-0.03	5.94	-0.01	6.27	0.00	5.79	0.10	6.15	0.10		
134	5.82	0.28	6.40	0.17	5.94	-0.01	6.38	0.12	5.60	-0.09	5.92	-0.13		
139	5.19	-0.35	5.91	-0.32	5.46	-0.49	5.82	-0.45	4.98	-0.71	5.54	-0.51		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

7.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	152	154	146	145	150	150	
p_1	34	34	33	33	34	34	
m	5.53	6.23	5.95	6.27	5.69	6.05	
s_r	0.11	0.07	0.10	0.14	0.11	0.11	
CV_r	1.98	1.06	1.64	2.17	1.96	1.74	
r	0.31	0.19	0.28	0.39	0.31	0.30	
s_R	0.29	0.24	0.27	0.28	0.33	0.32	0.25
CV_R	5.17	3.88	4.56	4.42	5.81	5.26	
R	0.81	0.68	0.77	0.78	0.93	0.90	0.71
HORRAT[1]	1.67	1.28	1.49	1.46	1.89	1.72	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

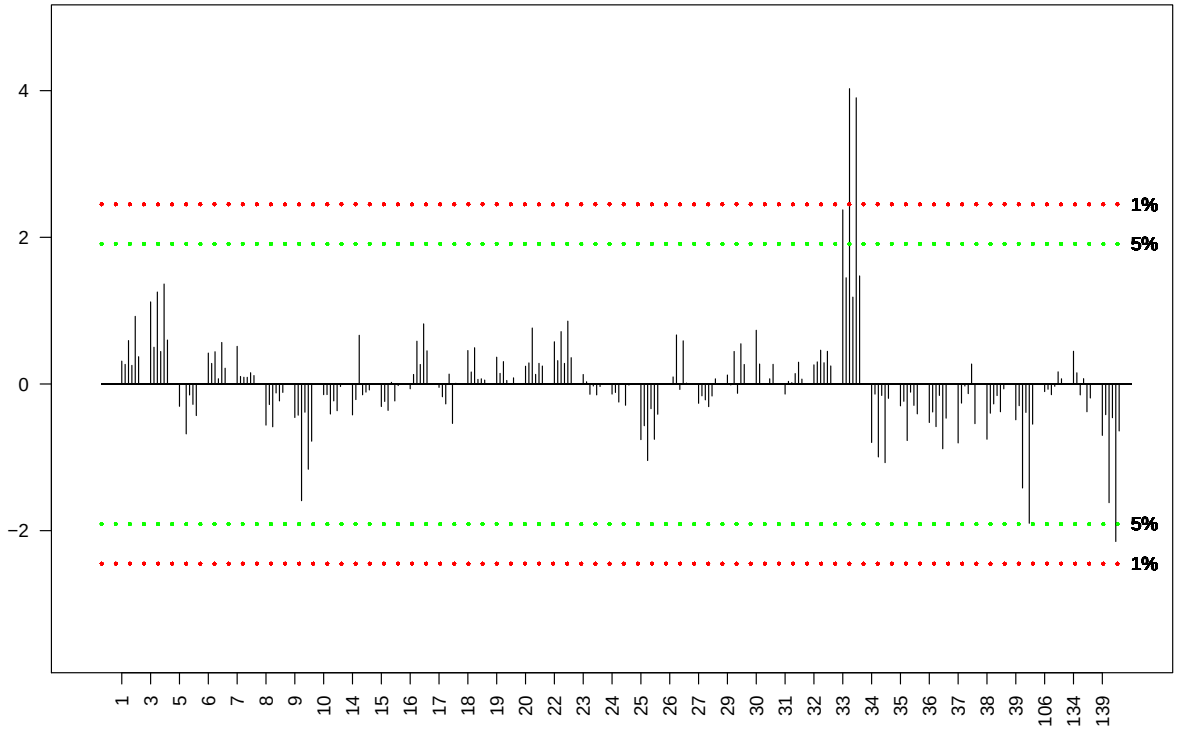
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7	c	C				
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26						C
27						
29						
30						
31		c				
32						
33	B	B	B	B	B	B
34	C		c	C		
35						
36						
37				C		
38						c
39					b	
106						
134						
139					b	

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

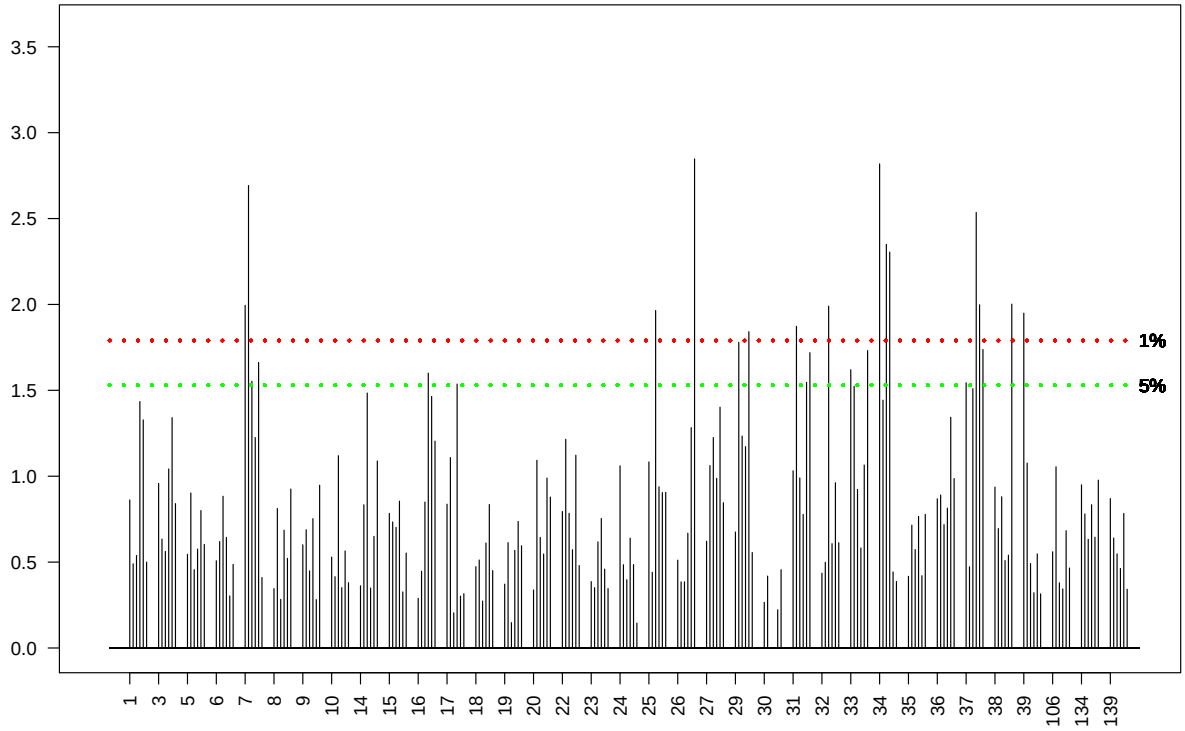
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

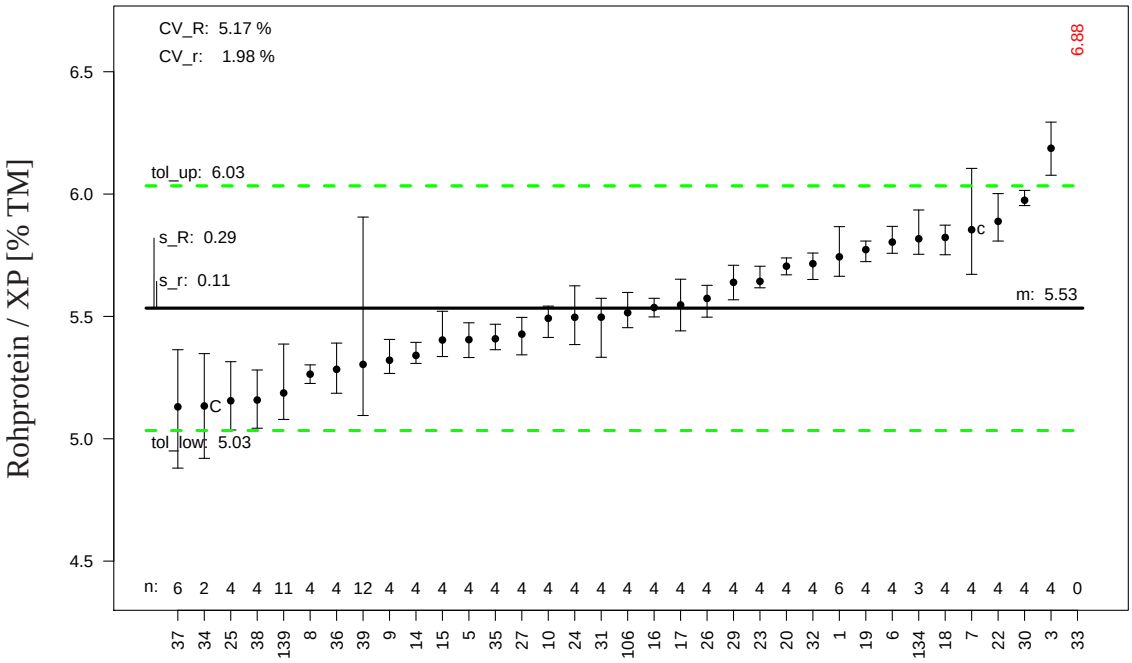
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

7.4 Einzelproben / Single Samples

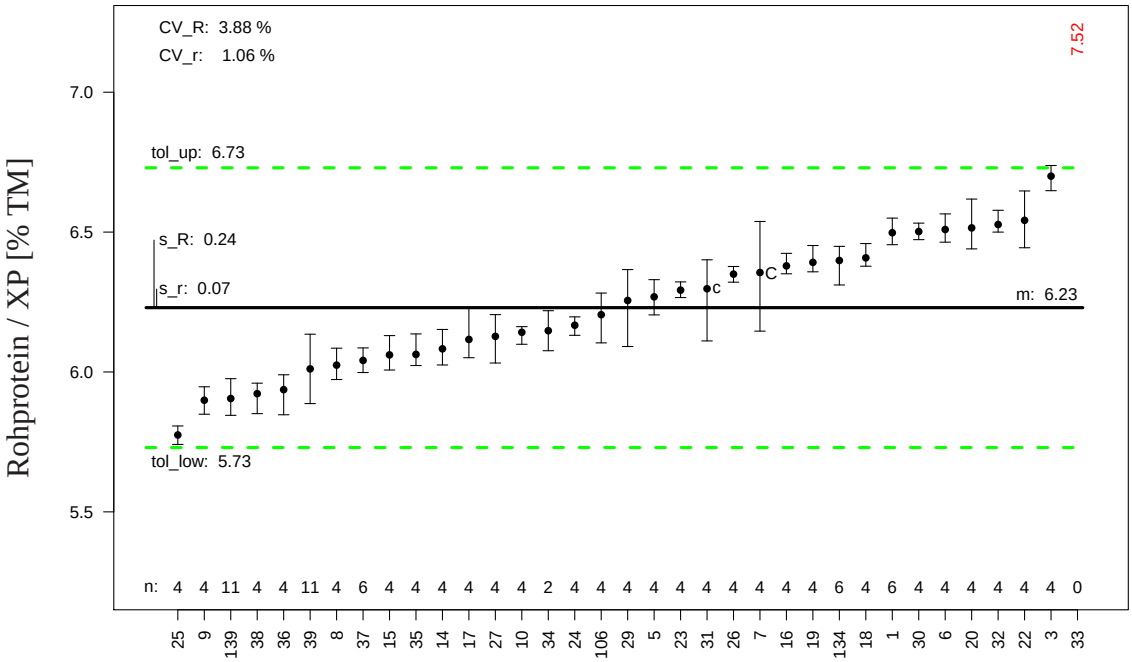
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

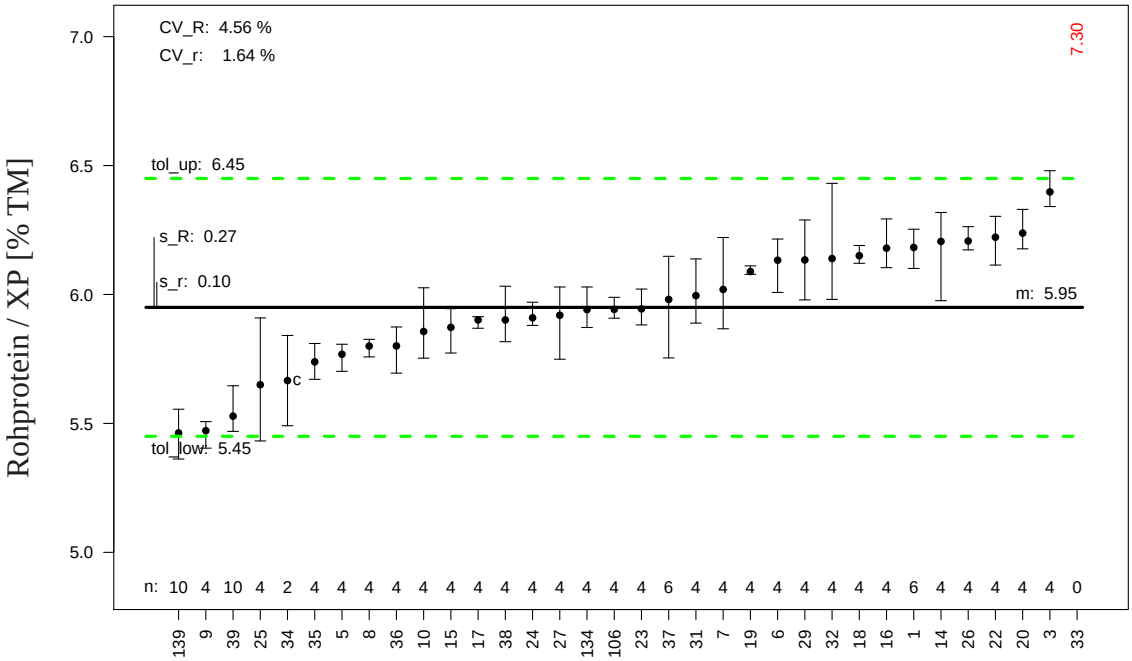
Probe/Sample 1901:



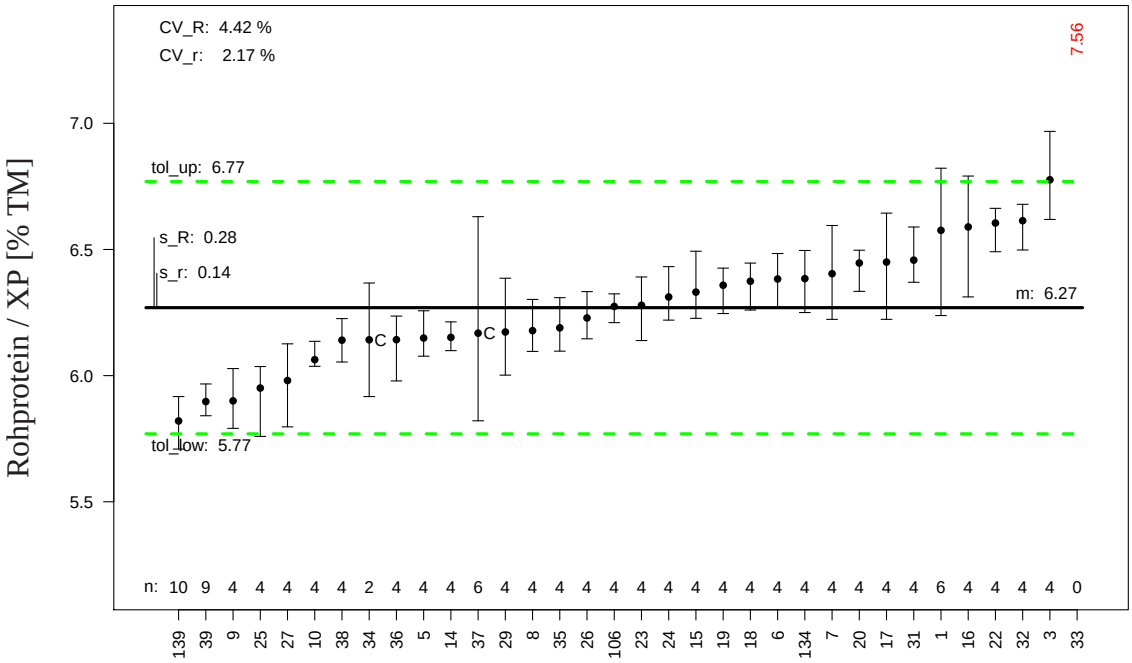
Probe/Sample 1902:



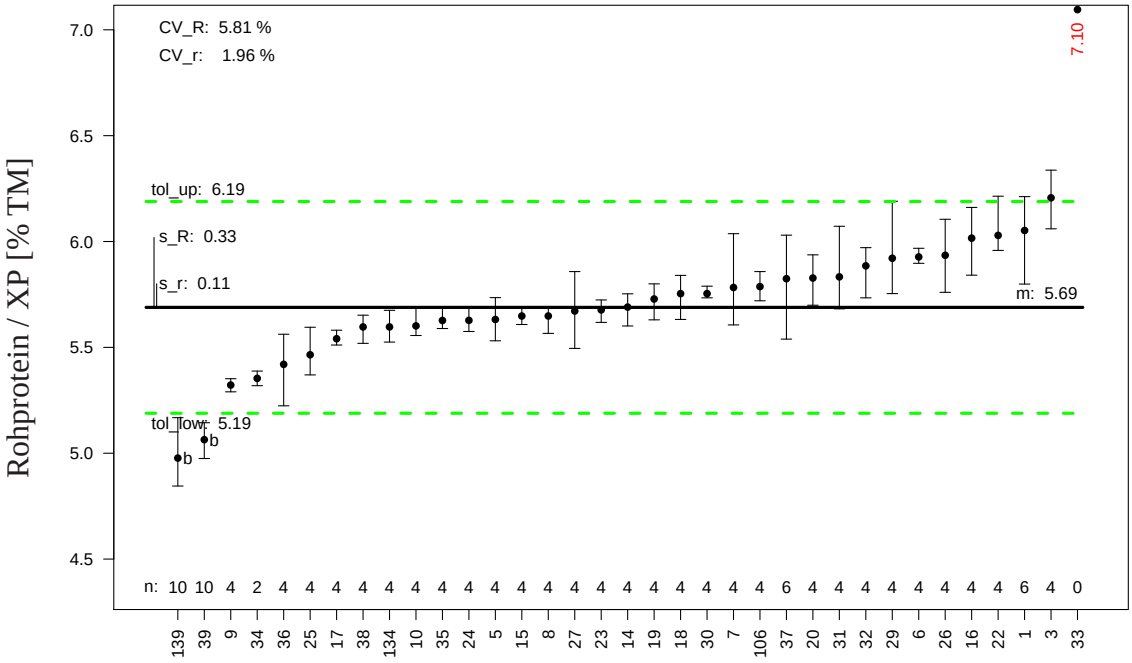
Probe/Sample 1903:



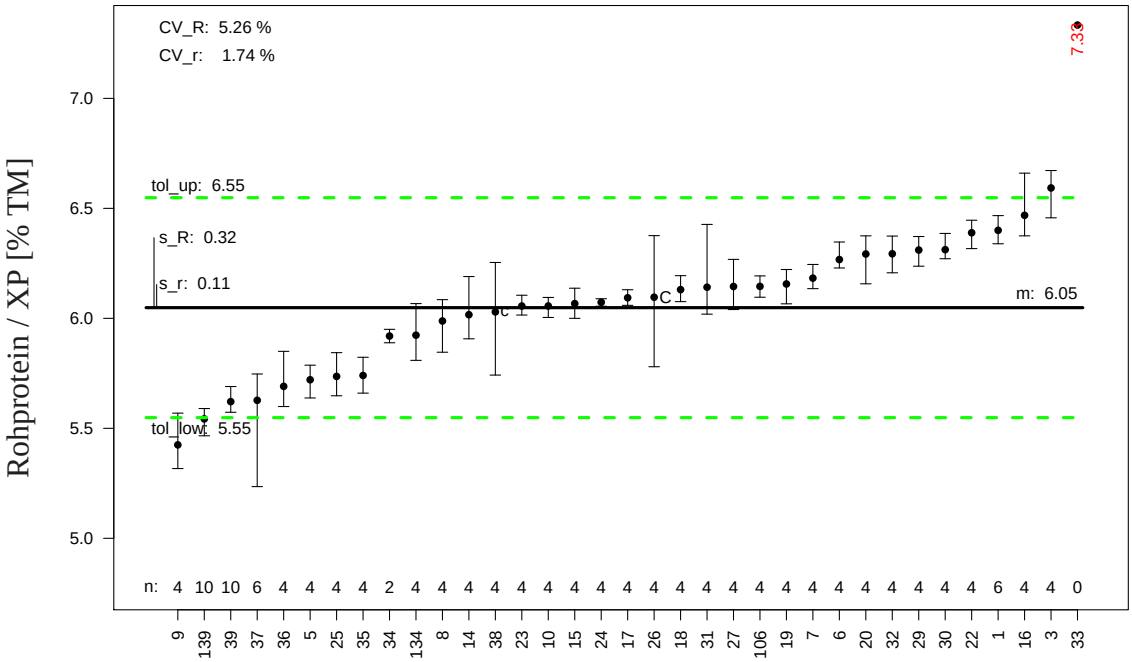
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



8 Merkmal / Constituent: Rohfaser / XF

Einheit / Unit: % TM

8.1 Anmerkungen / Annotations

8.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

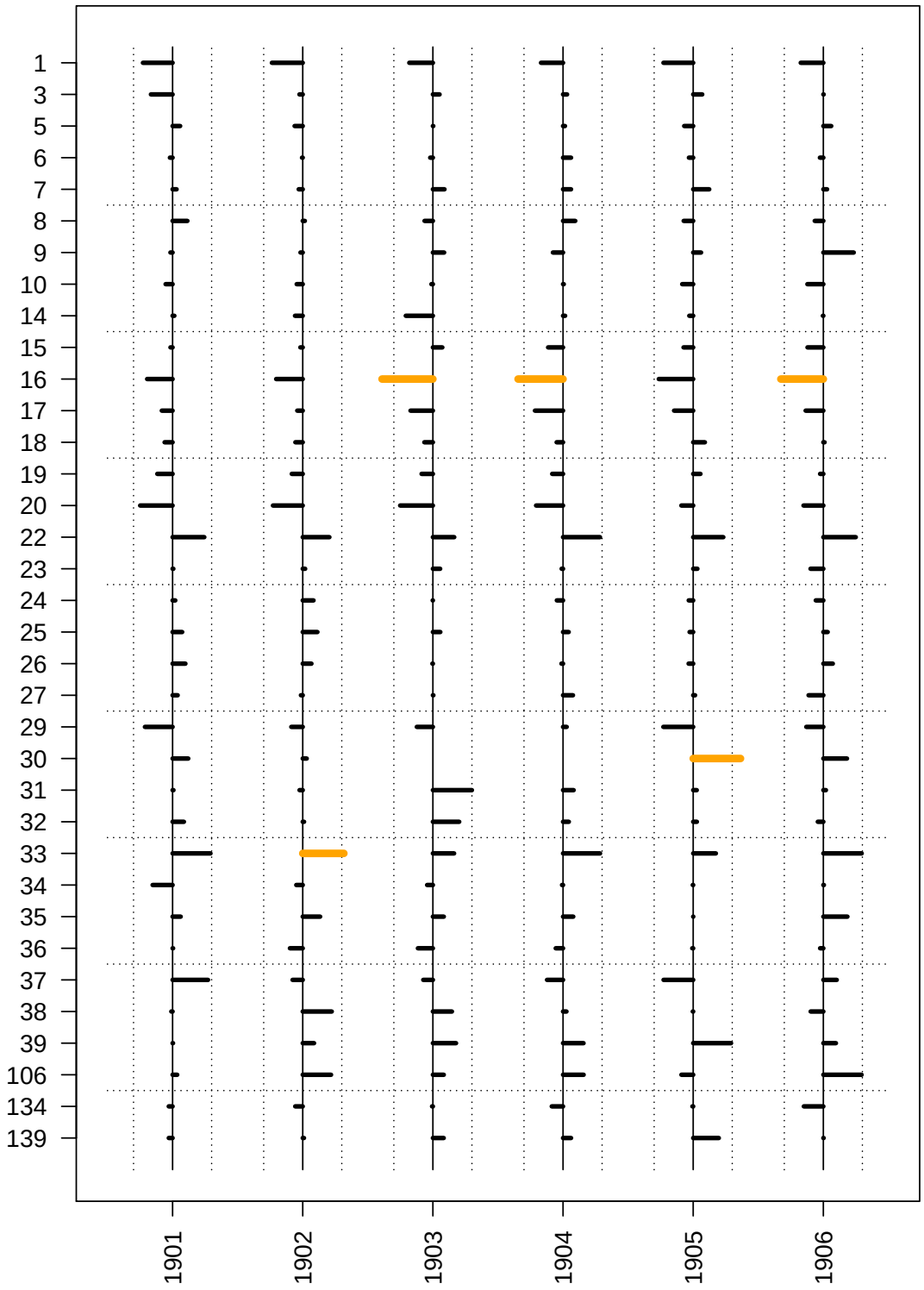
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1 % TM

Quelle / Source: VDLUFA ASR

Rohfaser / XF

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	23.21	-1.52	16.08	-1.58	17.61	-1.21	18.07	-1.13	17.98	-1.52	17.66	-1.16		
3	23.62	-1.11	17.49	-0.17	19.16	0.34	19.41	0.21	19.97	0.46	18.84	0.02		
5	25.11	0.39	17.24	-0.42	18.84	0.02	19.30	0.10	19.04	-0.46	19.23	0.40		
6	24.59	-0.14	17.62	-0.04	18.68	-0.14	19.61	0.41	19.29	-0.22	18.65	-0.18		
7	24.93	0.20	17.45	-0.21	19.41	0.59	19.61	0.41	20.32	0.82	19.01	0.19		
8	25.48	0.76	17.77	0.11	18.39	-0.43	19.83	0.63	19.02	-0.49	18.38	-0.44		
9	24.62	-0.11	17.54	-0.12	19.39	0.58	18.68	-0.52	19.91	0.40	20.38	1.56		
10	24.37	-0.36	17.35	-0.31	18.74	-0.08	19.24	0.04	18.94	-0.56	18.01	-0.82		
14	24.82	0.09	17.26	-0.40	17.43	-1.39	19.31	0.11	19.30	-0.20	18.80	-0.02		
15	24.62	-0.11	17.54	-0.12	19.30	0.48	18.44	-0.76	19.01	-0.49	18.01	-0.81		
16	23.42	-1.30	16.30	-1.36	16.21	-2.61	16.90	-2.30	17.74	-1.76	16.65	-2.18		
17	24.17	-0.55	17.38	-0.28	17.67	-1.15	17.76	-1.44	18.52	-0.98	17.92	-0.91		
18	24.32	-0.41	17.28	-0.38	18.38	-0.44	18.87	-0.33	20.10	0.60	18.89	0.06		
19	23.94	-0.78	17.10	-0.56	18.24	-0.58	18.64	-0.55	19.88	0.37	18.66	-0.17		
20	23.06	-1.66	16.13	-1.53	17.14	-1.68	17.82	-1.38	18.90	-0.61	17.81	-1.02		
22	26.35	1.62	19.03	1.36	19.91	1.09	21.09	1.89	21.05	1.54	20.48	1.66		
23	24.77	0.04	17.78	0.12	19.19	0.37	19.13	-0.07	19.72	0.21	18.17	-0.66		
24	24.86	0.14	18.21	0.55	18.81	-0.01	18.88	-0.32	19.28	-0.23	18.44	-0.39		
25	25.22	0.49	18.41	0.75	19.20	0.38	19.49	0.29	19.32	-0.18	19.05	0.22		
26	25.38	0.66	18.10	0.44	18.79	-0.03	19.12	-0.08	19.27	-0.23	19.31	0.48		
27	24.99	0.26	17.57	-0.09	18.84	0.02	19.71	0.51	19.60	0.10	18.07	-0.76		
29	23.31	-1.42	17.07	-0.59	17.99	-0.82	19.39	0.19	17.97	-1.53	17.95	-0.87		
30	25.53	0.80	17.86	0.20					21.93	2.43	20.03	1.21		
31	24.77	0.04	17.50	-0.16	20.81	2.00	19.74	0.54	19.69	0.18	18.95	0.13		
32	25.31	0.58	17.73	0.07	20.16	1.35	19.50	0.30	19.69	0.19	18.54	-0.28		
33	26.67	1.94	19.77	2.11	19.90	1.09	21.09	1.89	20.67	1.16	20.79	1.96		
34	23.70	-1.02	17.33	-0.33	18.52	-0.30	19.15	-0.05	19.48	-0.02	18.85	0.03		
35	25.14	0.41	18.55	0.89	19.37	0.56	19.72	0.52	19.51	0.00	20.06	1.23		
36	24.75	0.03	17.00	-0.66	18.05	-0.77	18.82	-0.37	19.46	-0.05	18.66	-0.17		
37	26.54	1.81	17.14	-0.52	18.32	-0.49	18.38	-0.82	17.99	-1.52	19.51	0.69		
38	24.66	-0.07	19.15	1.49	19.79	0.97	19.37	0.17	19.48	-0.02	18.17	-0.65		
39	24.75	0.02	18.24	0.58	20.00	1.19	20.25	1.05	21.44	1.94	19.47	0.64		
106	24.96	0.24	19.11	1.45	19.37	0.56	20.25	1.05	18.90	-0.60	20.78	1.96		
134	24.53	-0.20	17.28	-0.38	18.77	-0.04	18.62	-0.58	19.46	-0.04	17.82	-1.00		
139	24.53	-0.20	17.72	0.06	19.37	0.55	19.61	0.41	20.82	1.31	18.84	0.02		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

8.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	153	158	150	149	154	154	
p_1	35	35	34	34	35	35	
m	24.73	17.66	18.82	19.20	19.50	18.82	
s_r	0.39	0.27	0.50	0.56	0.67	0.54	
CV_r	1.58	1.51	2.63	2.94	3.42	2.87	
r	1.11	0.75	1.40	1.60	1.89	1.53	
s_R	0.90	0.83	1.05	1.00	1.19	1.04	1.00
CV_R	3.65	4.68	5.56	5.20	6.12	5.51	
R	2.56	2.34	2.96	2.83	3.38	2.94	2.83
HORRAT[1]	1.48	1.80	2.16	2.03	2.39	2.14	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

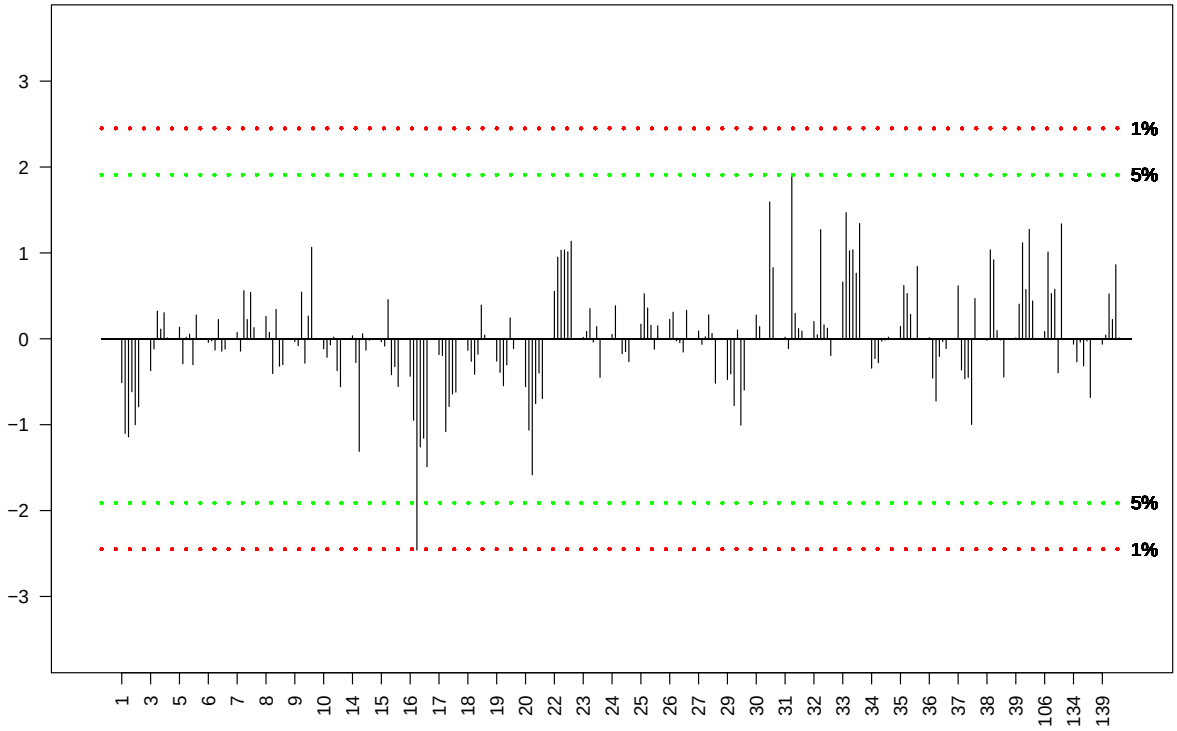
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1				C		
3						
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26						
27						
29						
30						
31		C			C	
32						
33						
34	c		C			
35						
36						
37				C		c
38						C
39	A					
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

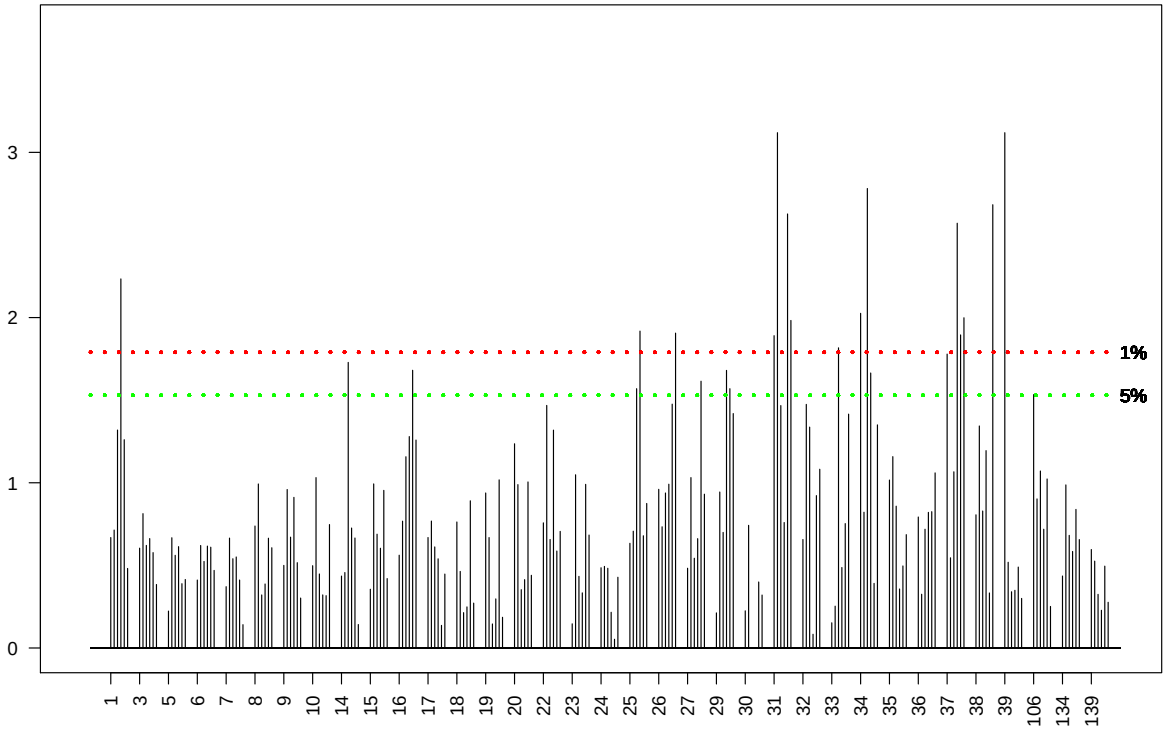
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

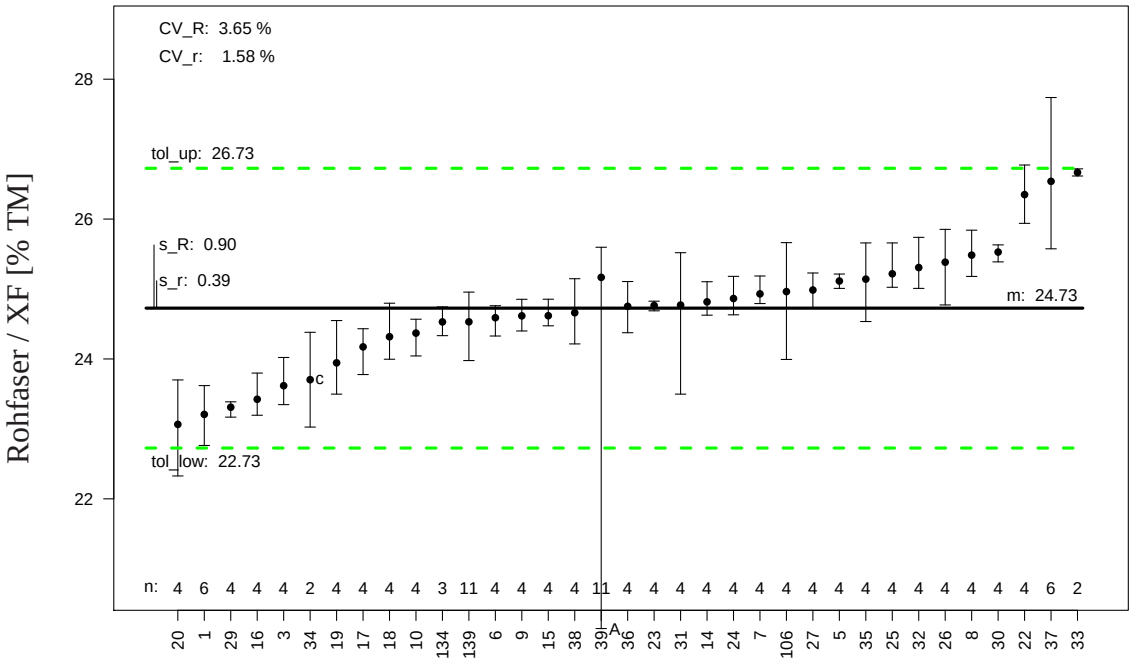
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

8.4 Einzelproben / Single Samples

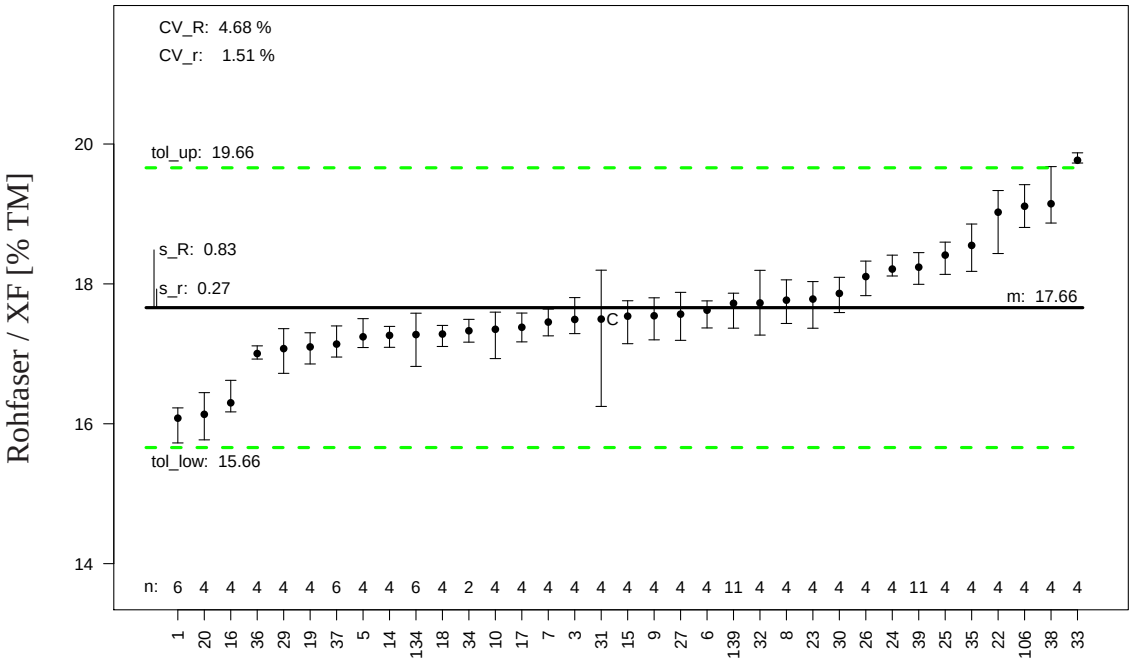
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

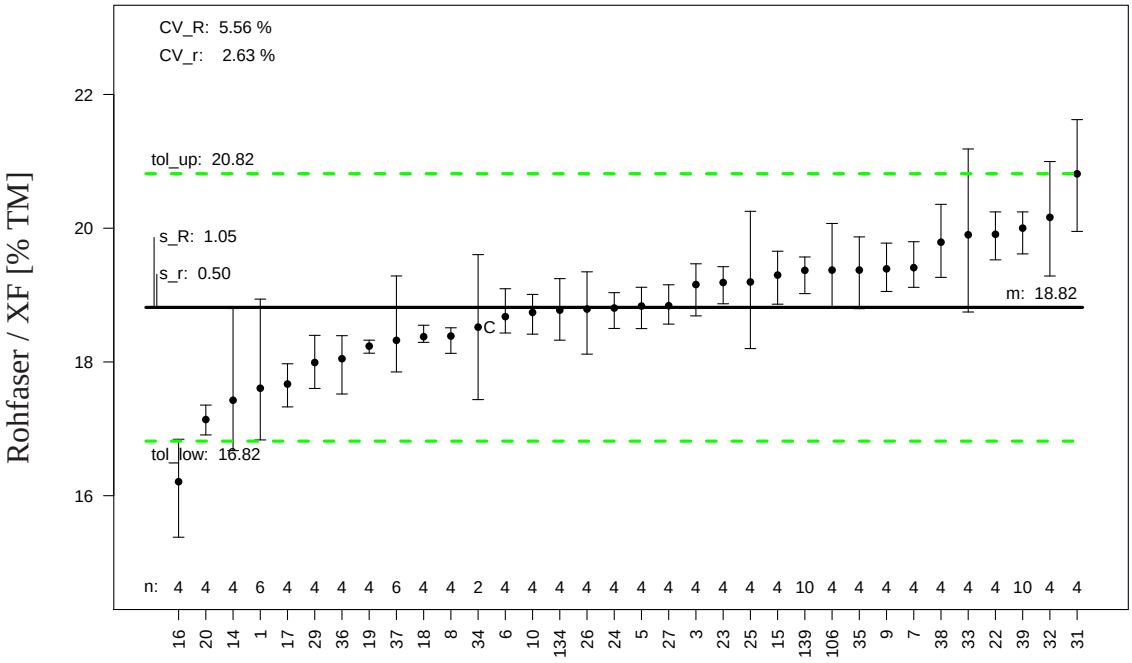
Probe/Sample 1901:



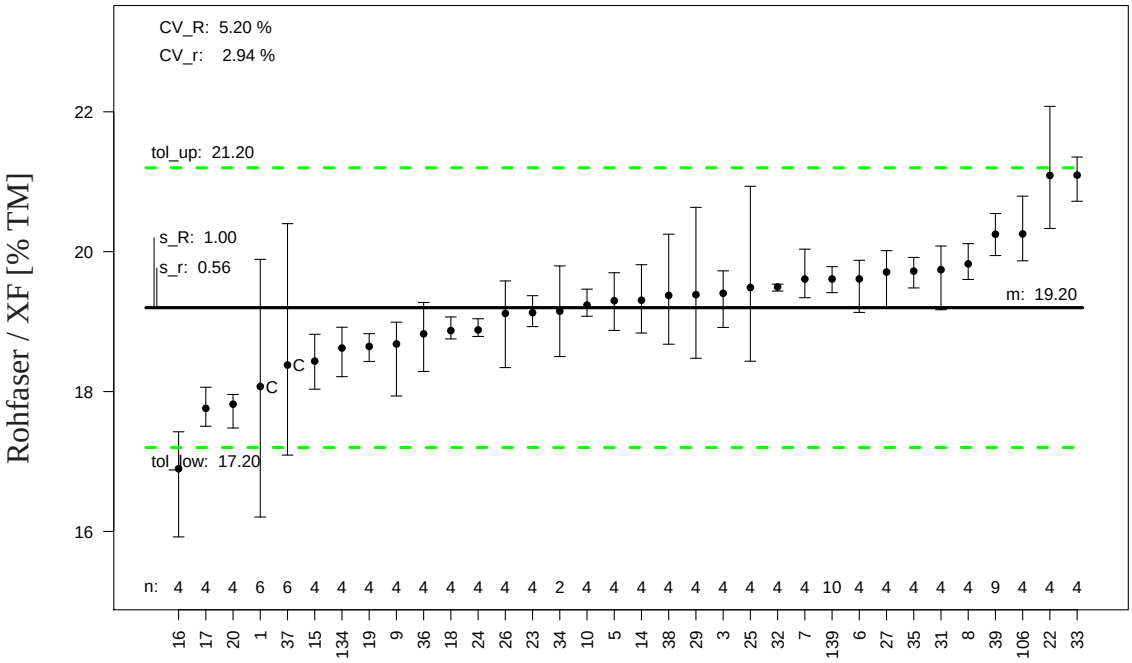
Probe/Sample 1902:



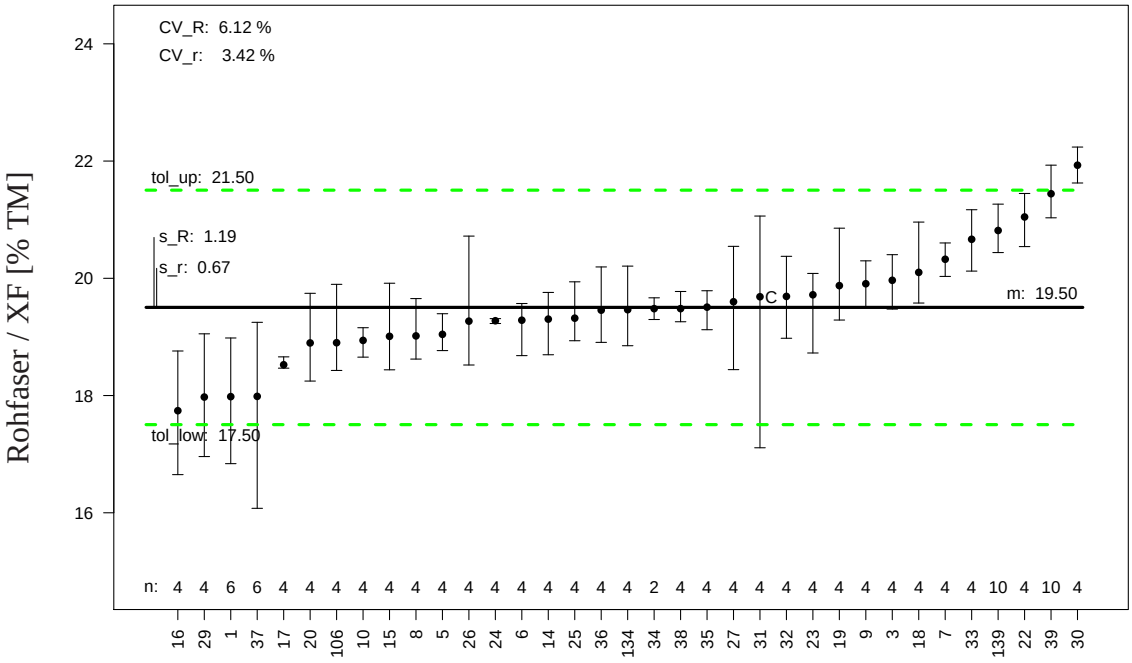
Probe/Sample 1903:



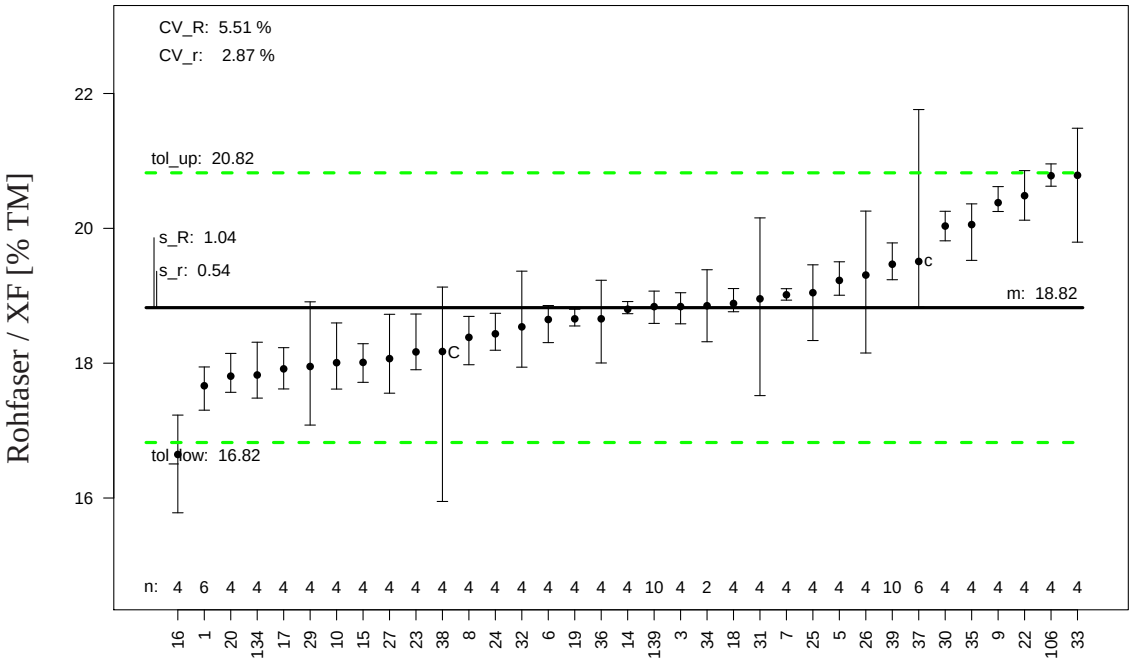
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



9 Merkmal / Constituent: Rohfett / XL

Einheit / Unit: % TM

9.1 Anmerkungen / Annotations

9.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

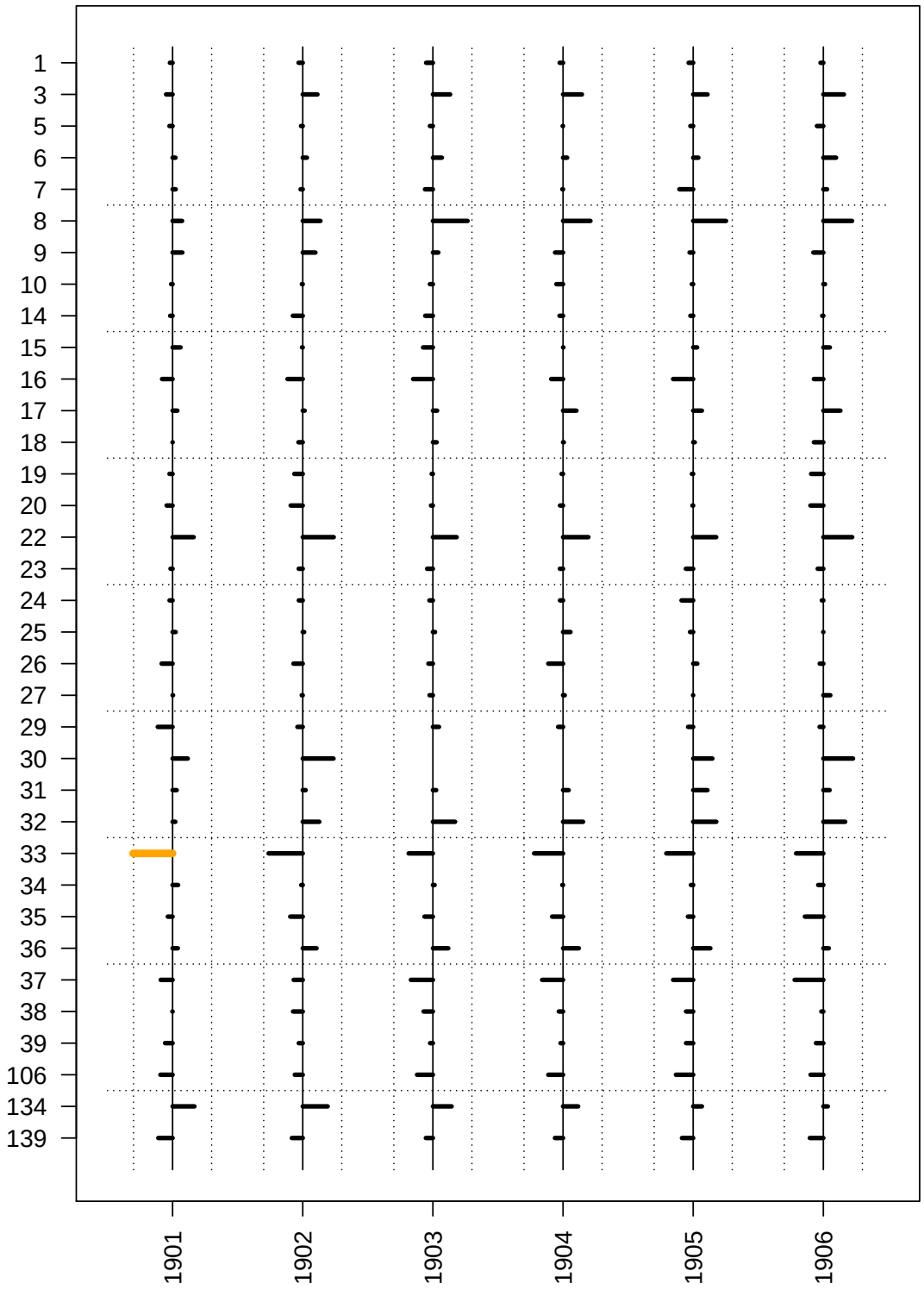
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 0.3 % TM

Quelle / Source: VDLUFA ASR

Rohfett / XL

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	2.16	-0.04	2.89	-0.06	2.42	-0.10	2.42	-0.05	2.31	-0.07	2.71	-0.04		
3	2.11	-0.10	3.18	0.23	2.79	0.27	2.76	0.29	2.60	0.22	3.07	0.32		
5	2.16	-0.05	2.92	-0.03	2.48	-0.05	2.47	-0.01	2.33	-0.04	2.65	-0.10		
6	2.25	0.05	3.01	0.06	2.66	0.14	2.54	0.06	2.46	0.08	2.95	0.20		
7	2.25	0.05	2.92	-0.03	2.40	-0.12	2.46	-0.01	2.16	-0.21	2.81	0.06		
8	2.35	0.15	3.22	0.27	3.06	0.53	2.89	0.42	2.88	0.50	3.19	0.44		
9	2.36	0.15	3.14	0.19	2.61	0.08	2.35	-0.12	2.32	-0.06	2.60	-0.15		
10	2.18	-0.02	2.94	-0.01	2.48	-0.05	2.37	-0.10	2.36	-0.02	2.78	0.03		
14	2.17	-0.04	2.80	-0.15	2.41	-0.12	2.42	-0.05	2.33	-0.04	2.73	-0.02		
15	2.33	0.12	2.94	-0.01	2.37	-0.15	2.48	0.01	2.44	0.06	2.85	0.10		
16	2.04	-0.16	2.72	-0.23	2.22	-0.30	2.29	-0.18	2.07	-0.31	2.60	-0.15		
17	2.28	0.07	2.98	0.03	2.59	0.06	2.68	0.21	2.51	0.13	3.01	0.26		
18	2.21	0.00	2.88	-0.07	2.58	0.06	2.49	0.01	2.40	0.02	2.60	-0.15		
19	2.16	-0.05	2.82	-0.13	2.51	-0.02	2.45	-0.02	2.36	-0.02	2.56	-0.19		
20	2.11	-0.09	2.76	-0.19	2.50	-0.03	2.43	-0.05	2.36	-0.01	2.55	-0.20		
22	2.53	0.32	3.43	0.48	2.89	0.37	2.86	0.39	2.73	0.35	3.19	0.44		
23	2.17	-0.03	2.89	-0.06	2.44	-0.09	2.42	-0.05	2.26	-0.11	2.66	-0.09		
24	2.16	-0.05	2.89	-0.06	2.47	-0.05	2.43	-0.05	2.20	-0.18	2.73	-0.02		
25	2.25	0.05	2.97	0.02	2.56	0.03	2.59	0.11	2.33	-0.05	2.75	-0.00		
26	2.04	-0.17	2.81	-0.14	2.46	-0.07	2.25	-0.23	2.44	0.06	2.69	-0.06		
27	2.21	0.01	2.93	-0.01	2.47	-0.05	2.50	0.03	2.37	-0.00	2.86	0.11		
29	1.98	-0.23	2.87	-0.08	2.62	0.09	2.40	-0.08	2.30	-0.08	2.69	-0.06		
30	2.44	0.23	3.42	0.47					2.67	0.30	3.21	0.46		
31	2.27	0.06	2.99	0.04	2.58	0.05	2.56	0.09	2.60	0.22	2.85	0.10		
32	2.25	0.04	3.20	0.26	2.87	0.34	2.78	0.31	2.73	0.36	3.09	0.34		
33	1.60	-0.61	2.42	-0.52	2.15	-0.37	2.03	-0.44	1.96	-0.41	2.33	-0.42		
34	2.29	0.08	2.93	-0.02	2.55	0.03	2.46	-0.01	2.34	-0.04	2.67	-0.08		
35	2.13	-0.07	2.76	-0.19	2.40	-0.13	2.31	-0.17	2.30	-0.08	2.47	-0.28		
36	2.29	0.08	3.16	0.21	2.76	0.24	2.71	0.24	2.64	0.26	2.83	0.08		
37	2.02	-0.18	2.81	-0.14	2.19	-0.34	2.15	-0.32	2.07	-0.31	2.31	-0.44		
38	2.20	-0.00	2.80	-0.15	2.38	-0.14	2.41	-0.06	2.27	-0.11	2.72	-0.03		
39	2.09	-0.12	2.89	-0.06	2.48	-0.04	2.43	-0.04	2.27	-0.11	2.64	-0.11		
106	2.02	-0.19	2.83	-0.12	2.28	-0.24	2.25	-0.23	2.11	-0.27	2.55	-0.20		
134	2.54	0.34	3.33	0.38	2.81	0.29	2.71	0.23	2.51	0.13	2.82	0.07		
139	1.99	-0.22	2.78	-0.17	2.42	-0.11	2.35	-0.12	2.20	-0.17	2.54	-0.21		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

9.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	152	158	150	149	154	154	
p_1	34	35	34	34	35	35	
m	2.21	2.95	2.53	2.47	2.38	2.75	
s_r	0.08	0.07	0.08	0.09	0.09	0.09	
CV_r	3.79	2.41	3.10	3.63	3.75	3.13	
r	0.24	0.20	0.22	0.25	0.25	0.24	
s_R	0.16	0.21	0.21	0.21	0.22	0.24	0.30
CV_R	7.22	7.24	8.28	8.31	9.13	8.58	
R	0.45	0.60	0.59	0.58	0.61	0.67	0.85
HORRAT[1]	2.03	2.13	2.38	2.38	2.60	2.50	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

Rohfett / XL

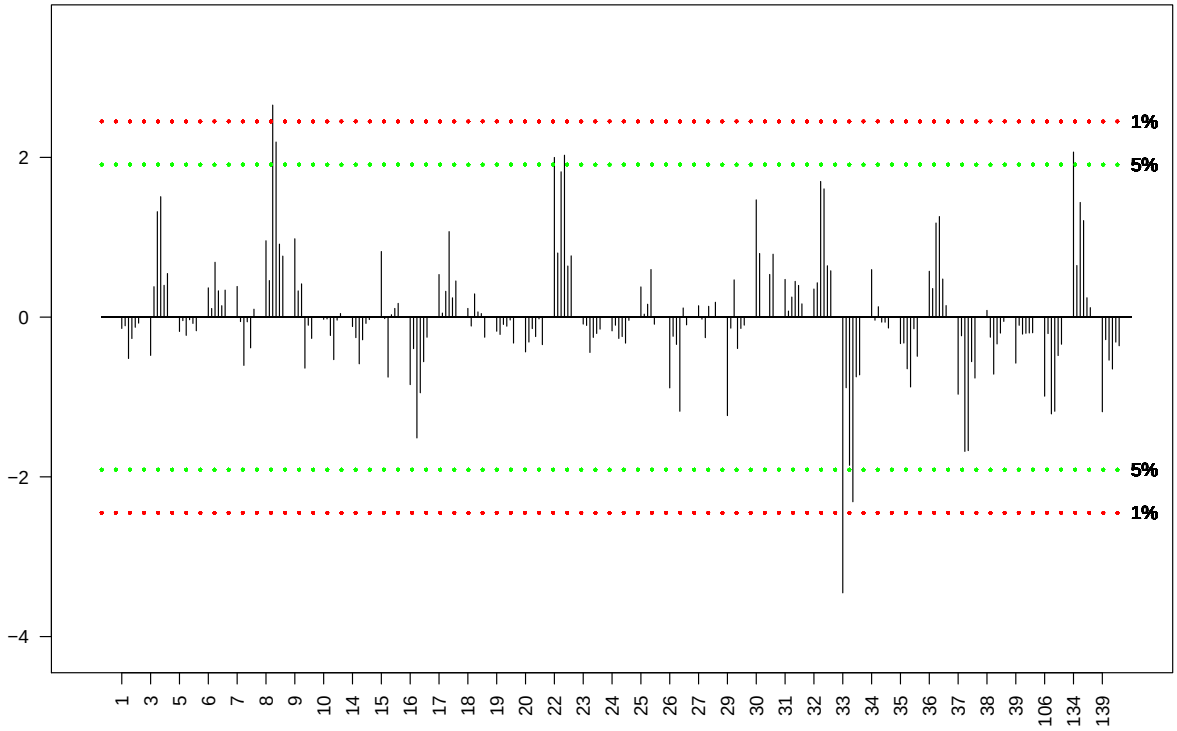
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26	C	C				c
27						
29						
30						
31		C	c		C	C
32						
33	B					
34						
35						
36						
37						
38						
39						
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

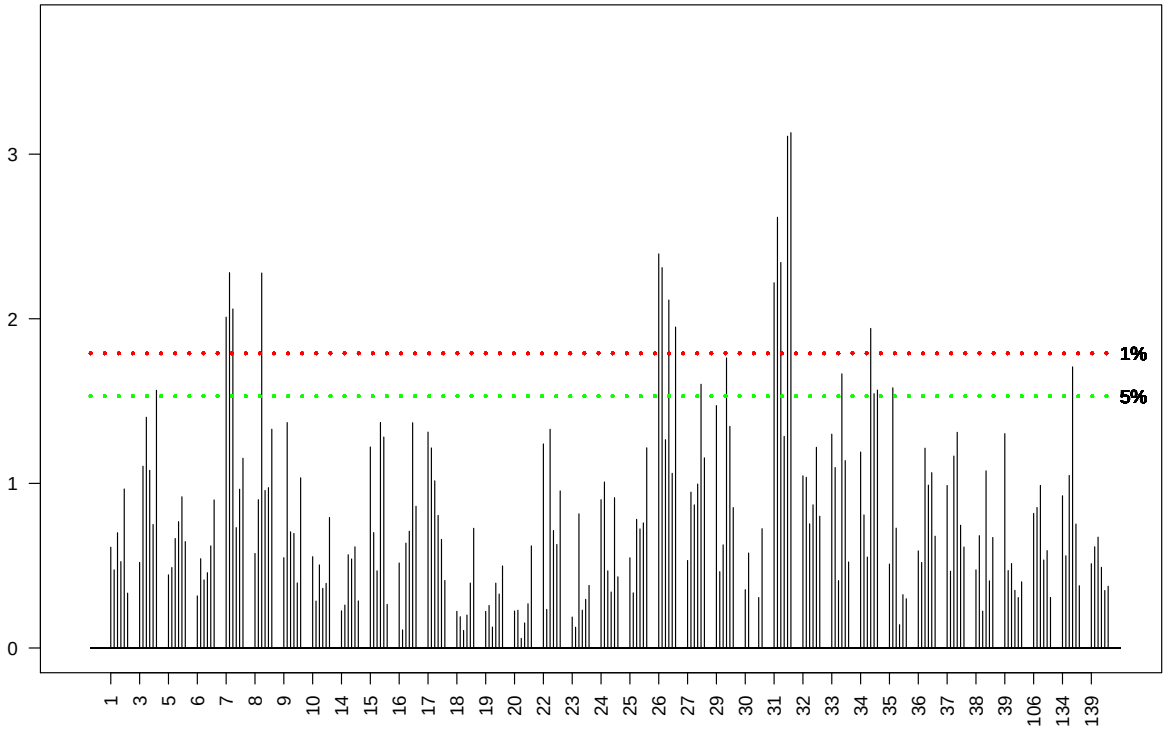
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

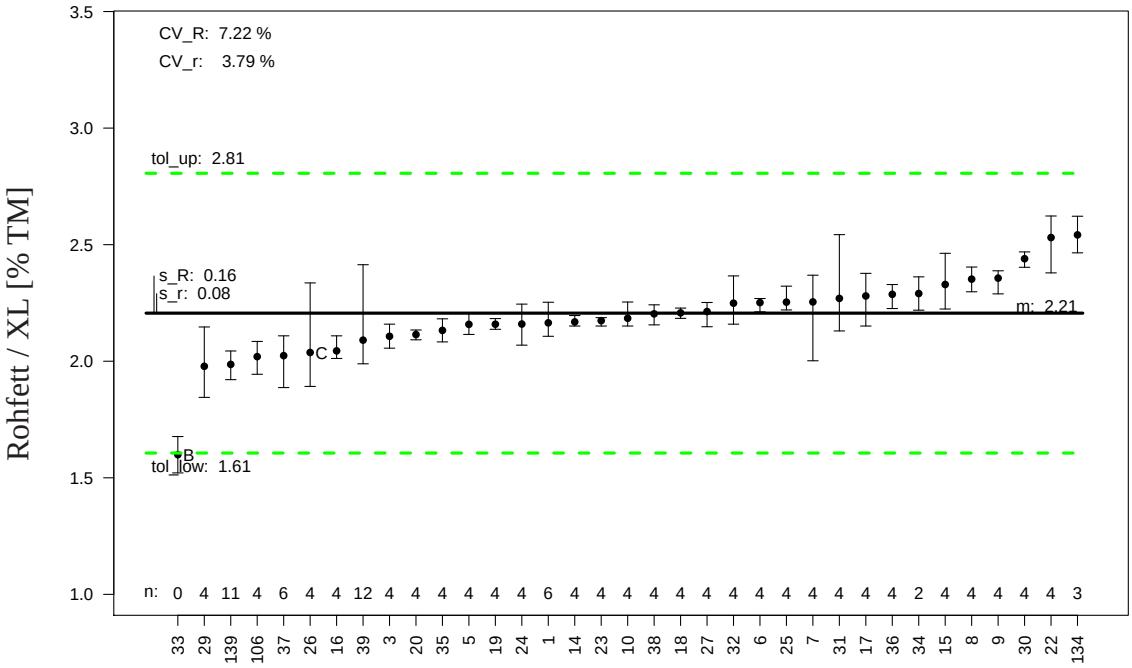
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

9.4 Einzelproben / Single Samples

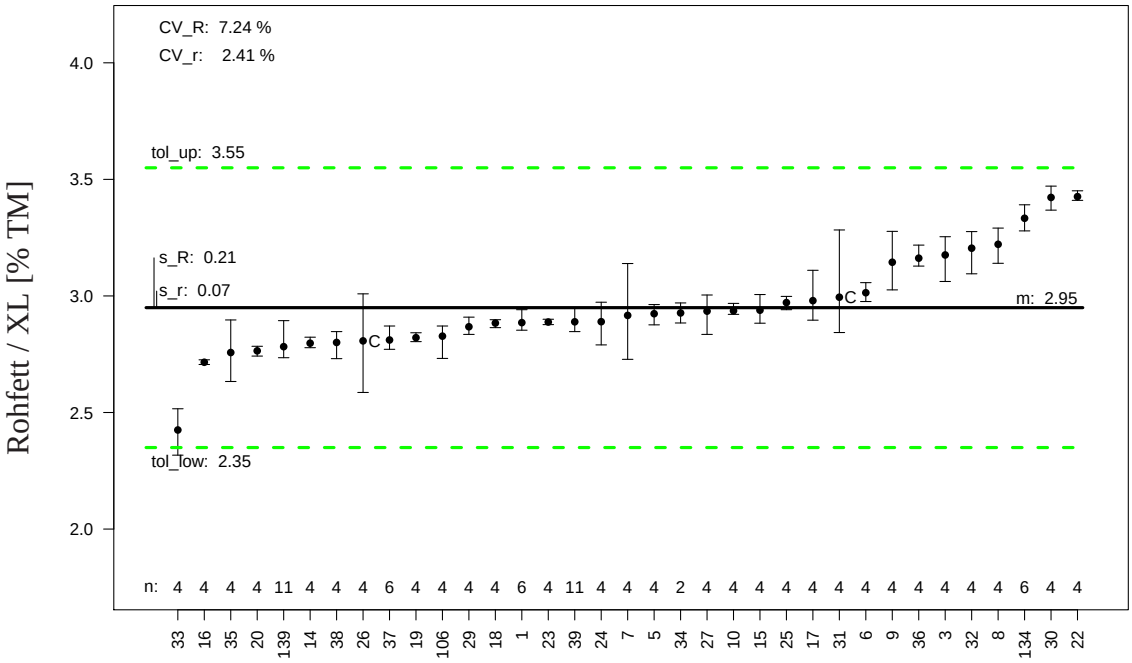
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

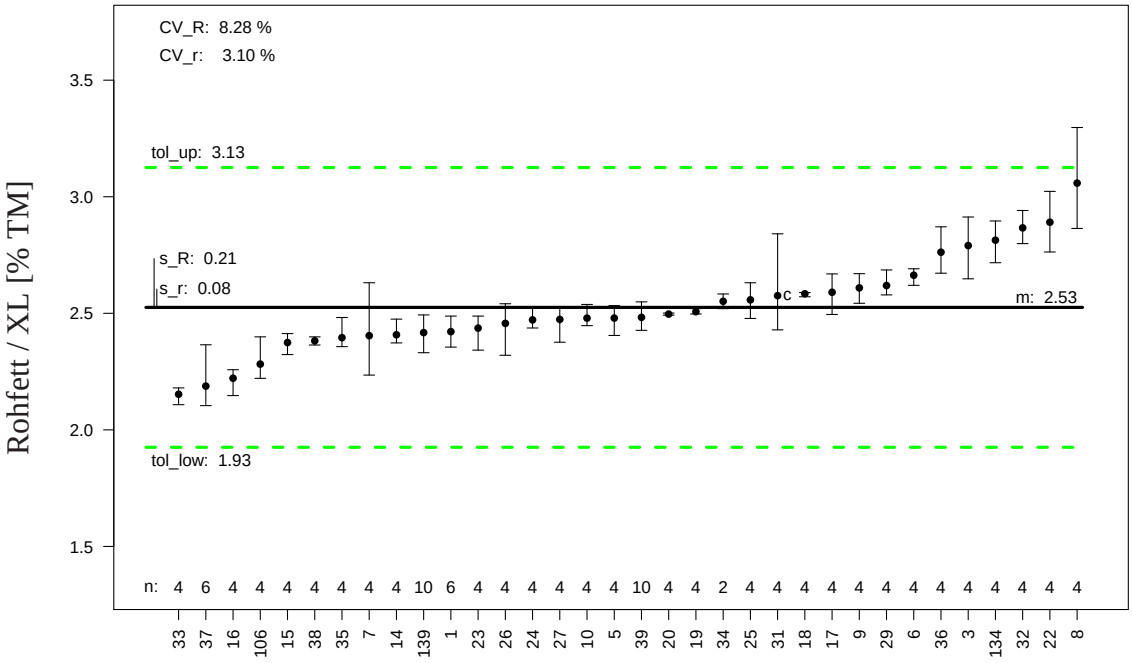
Probe/Sample 1901:



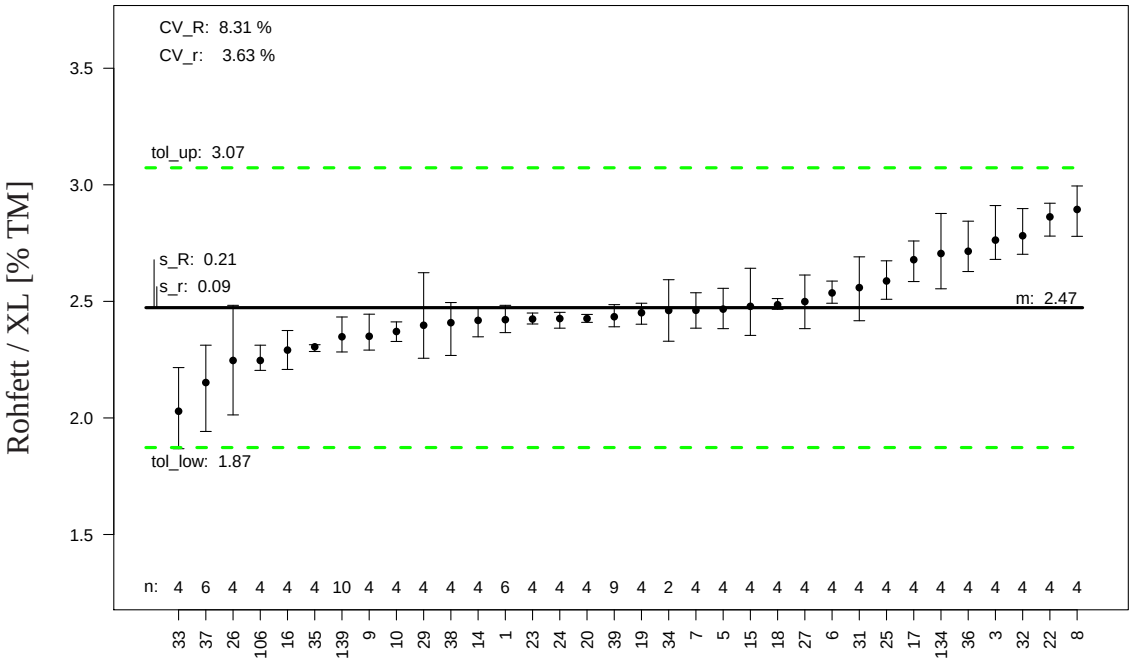
Probe/Sample 1902:



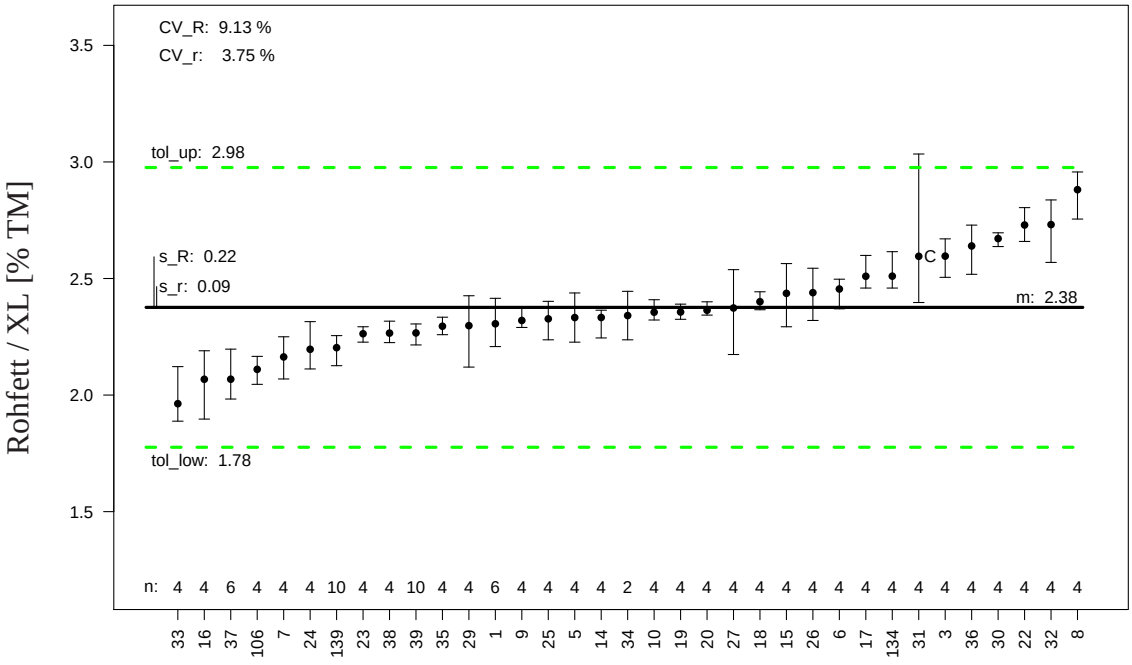
Probe/Sample 1903:



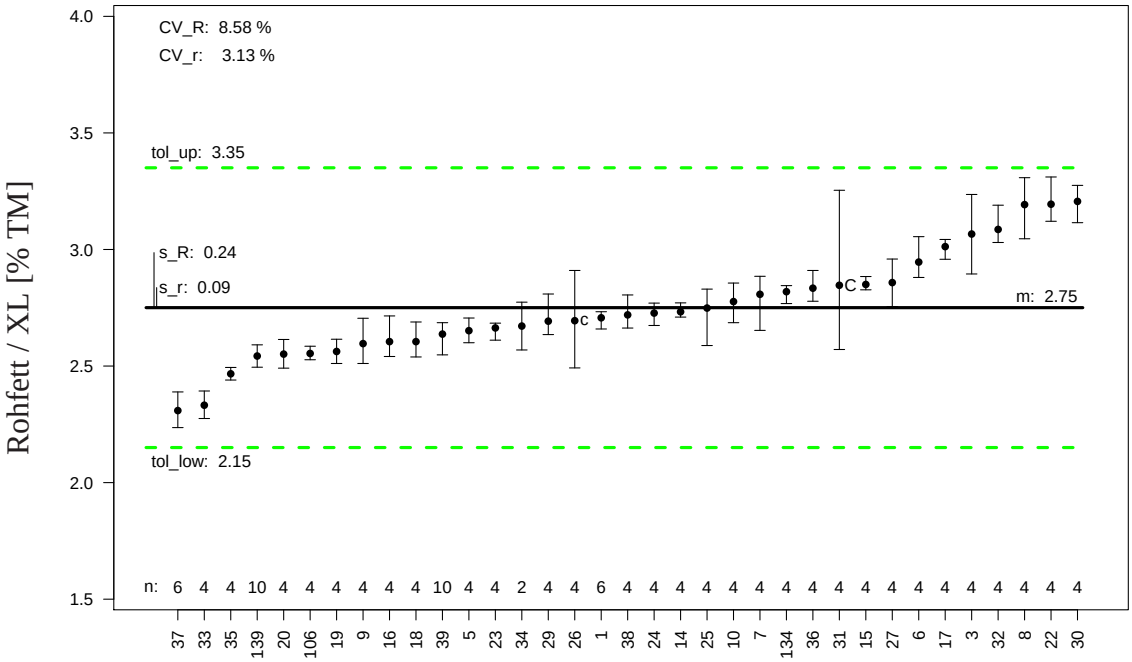
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



10 Merkmal / Constituent: Stärke / XS

Einheit / Unit: % TM

10.1 Anmerkungen / Annotations

Die Vergleichbarkeit für die Laborbeurteilung wurde in Anlehnung an die VDLFUFA Analysenspielräume gesetzt. Da aber in den Vorjahren beim Merkmal Stärke stets die meisten "Abweichungen" für die Labore verursacht wurden, wurde dieses Jahr die Vergleichstandardabweichung statt mit 1% (gemäß VDLUFA ASR) mit 2% angesetzt.

Hintergrund dieser Entscheidung ist, dass die Beschreibung des Stärke-Modells immer behauptet hat, dass ein Methodenfehler (SEP - oder SEP(C) nach ISI-Notation: Vergleich NIRS-Schätzwerte mti den Referenzwerten) von ca. 2% nicht unterschritten wird. Die mit 1% deutlich engeren Grenzen für die Vergleichbarkeit sind nach der Meinung des Autor nicht realistisch, da diese Präzision für die NIRS-Messung von Stärke an Silomais nie behauptet wurde.

10.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

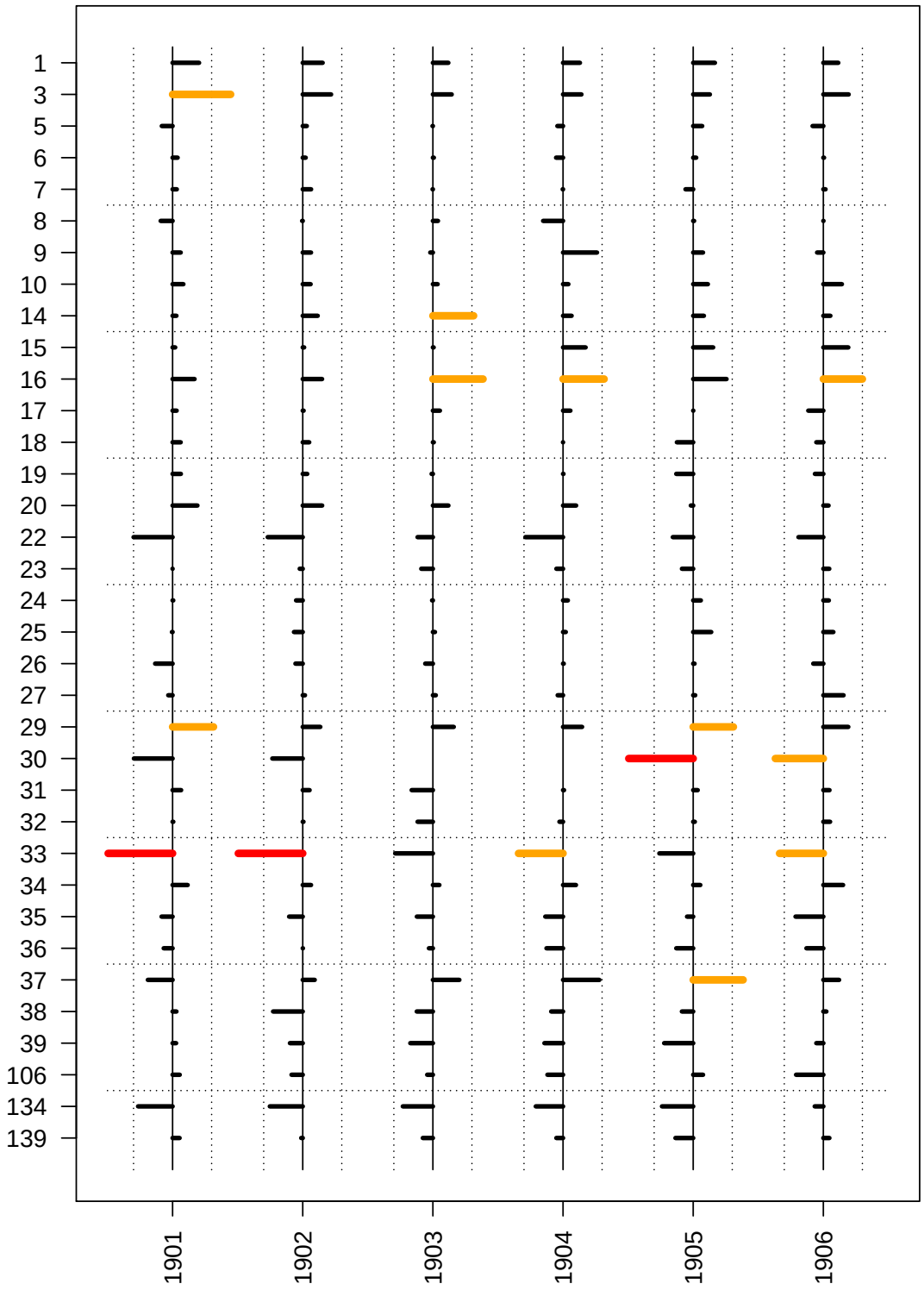
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 2 % TM

Quelle / Source: VDLUFA ASR

Stärke / XS

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	25.40	2.71	35.72	2.04	38.20	1.58	35.45	1.73	36.98	2.22	34.11	1.53		
3	28.63	5.94	36.58	2.90	38.54	1.92	35.60	1.88	36.46	1.71	35.17	2.59		
5	21.59	-1.10	34.09	0.41	36.58	-0.04	33.14	-0.58	35.67	0.92	31.48	-1.10		
6	23.20	0.51	33.98	0.30	36.71	0.10	33.01	-0.71	35.06	0.31	32.65	0.07		
7	23.12	0.43	34.53	0.85	36.58	-0.03	33.68	-0.04	33.97	-0.79	32.80	0.22		
8	21.47	-1.22	33.62	-0.06	37.13	0.52	31.68	-2.04	34.84	0.09	32.59	0.01		
9	23.52	0.83	34.52	0.85	36.35	-0.27	37.20	3.48	35.76	1.00	31.94	-0.64		
10	23.79	1.10	34.48	0.80	37.10	0.48	34.26	0.54	36.25	1.50	34.48	1.90		
14	23.08	0.39	35.21	1.53	40.79	4.17	34.60	0.88	35.85	1.09	33.30	0.72		
15	22.96	0.27	33.82	0.14	36.69	0.08	36.03	2.31	36.80	2.05	35.14	2.55		
16	24.94	2.25	35.66	1.98	41.75	5.14	37.93	4.21	38.17	3.42	36.58	4.00		
17	23.10	0.41	33.68	-0.00	37.33	0.72	34.47	0.75	34.76	0.01	31.04	-1.54		
18	23.52	0.83	34.34	0.66	36.71	0.09	33.72	-0.00	33.08	-1.67	31.87	-0.72		
19	23.54	0.85	34.14	0.46	36.48	-0.13	33.76	0.04	33.02	-1.73	31.72	-0.86		
20	25.23	2.54	35.67	1.99	38.20	1.59	35.06	1.34	34.51	-0.24	33.11	0.53		
22	18.69	-4.00	30.09	-3.58	35.05	-1.57	29.87	-3.85	32.67	-2.09	30.04	-2.55		
23	22.68	-0.00	33.37	-0.31	35.43	-1.19	33.04	-0.68	33.60	-1.15	33.19	0.60		
24	22.76	0.07	33.00	-0.68	36.54	-0.08	34.21	0.49	35.53	0.78	33.14	0.56		
25	22.63	-0.06	32.78	-0.90	36.82	0.21	34.00	0.28	36.60	1.85	33.61	1.03		
26	20.90	-1.79	32.93	-0.75	35.83	-0.78	33.79	0.07	34.89	0.14	31.55	-1.03		
27	22.25	-0.44	33.90	0.22	36.91	0.30	33.17	-0.55	34.96	0.21	34.65	2.07		
29	26.88	4.19	35.48	1.80	38.75	2.13	35.67	1.95	38.87	4.12	35.14	2.55		
30	18.73	-3.96	30.56	-3.11					28.51	-6.24	27.67	-4.91		
31	23.56	0.87	34.38	0.70	34.44	-2.17	33.82	0.10	35.21	0.46	33.21	0.63		
32	22.76	0.07	33.75	0.07	35.05	-1.57	33.35	-0.37	34.92	0.16	33.27	0.69		
33	16.19	-6.50	27.04	-6.64	32.75	-3.86	29.16	-4.56	31.29	-3.47	28.10	-4.48		
34	24.23	1.54	34.53	0.85	37.28	0.66	35.04	1.32	35.48	0.73	34.60	2.02		
35	21.56	-1.13	32.28	-1.39	34.97	-1.64	31.90	-1.82	34.13	-0.63	29.73	-2.85		
36	21.78	-0.91	33.70	0.02	36.21	-0.40	32.02	-1.70	33.02	-1.73	30.85	-1.73		
37	20.16	-2.53	34.90	1.22	39.32	2.71	37.43	3.71	39.87	5.12	34.19	1.61		
38	23.08	0.39	30.64	-3.04	34.96	-1.65	32.51	-1.21	33.60	-1.16	32.89	0.31		
39	23.05	0.36	32.37	-1.31	34.30	-2.31	31.81	-1.91	31.78	-2.97	31.86	-0.72		
106	23.42	0.73	32.53	-1.15	36.03	-0.58	32.12	-1.60	35.76	1.01	29.79	-2.79		
134	19.16	-3.53	30.31	-3.37	33.54	-3.08	30.93	-2.79	31.56	-3.20	31.70	-0.88		
139	23.40	0.72	33.53	-0.15	35.58	-1.03	33.04	-0.68	32.93	-1.82	33.20	0.62		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

10.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	153	154	150	149	154	154	
p_1	35	34	34	34	35	35	
m	22.69	33.68	36.61	33.72	34.75	32.58	
s_r	0.67	0.46	0.89	1.11	1.24	1.03	
CV_r	2.94	1.36	2.42	3.30	3.57	3.15	
r	1.89	1.29	2.51	3.15	3.51	2.91	
s_R	2.19	1.63	2.04	2.21	2.57	2.11	2.00
CV_R	9.64	4.85	5.57	6.55	7.39	6.48	
R	6.19	4.62	5.77	6.25	7.27	5.97	5.66
HORRAT[1]	3.86	2.06	2.39	2.78	3.15	2.74	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

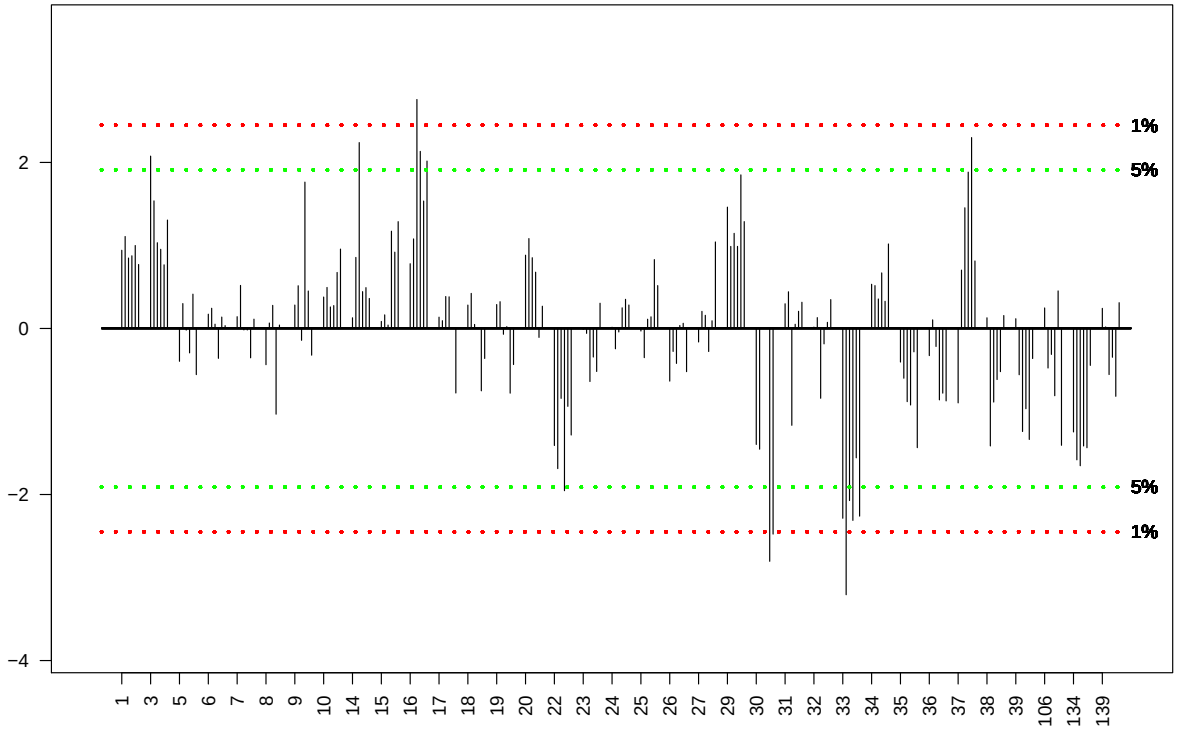
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7						
8						
9						
10						
14			bc			
15						
16			b			
17						
18						
19						
20						
22						
23						
24						
25				c		
26						
27						
29					c	
30						
31		C				
32		C				
33		B				
34	C					
35						
36						
37						
38						
39	A					
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

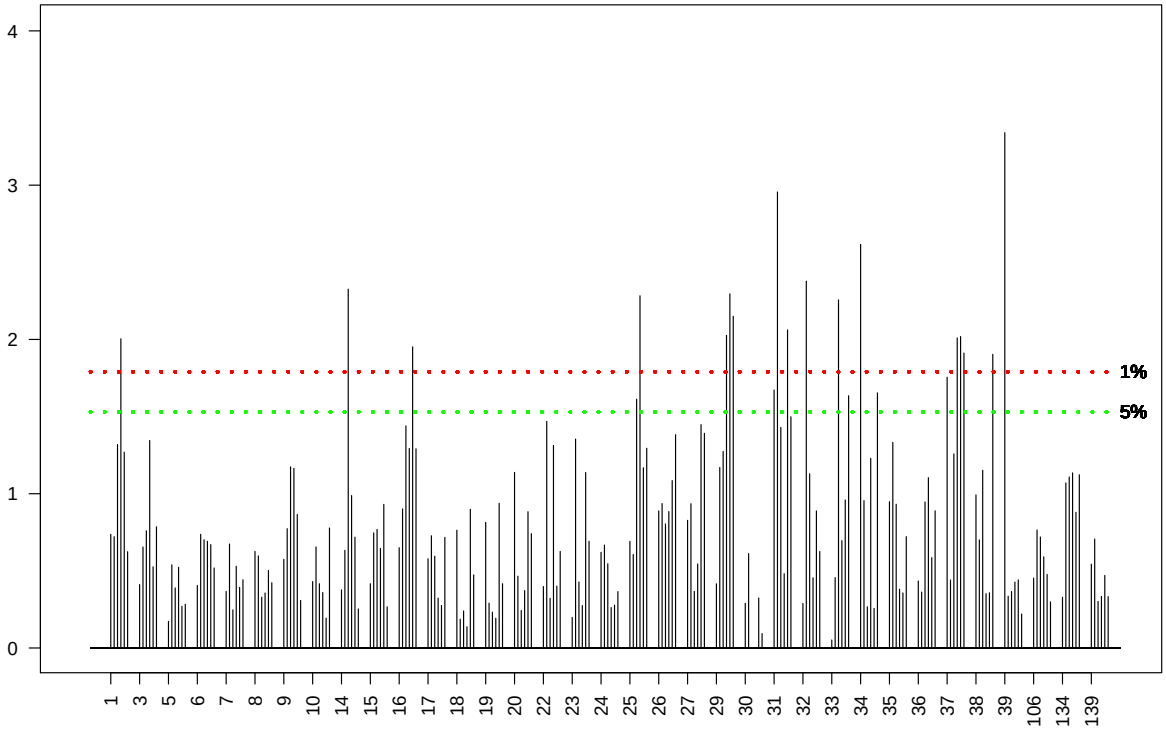
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

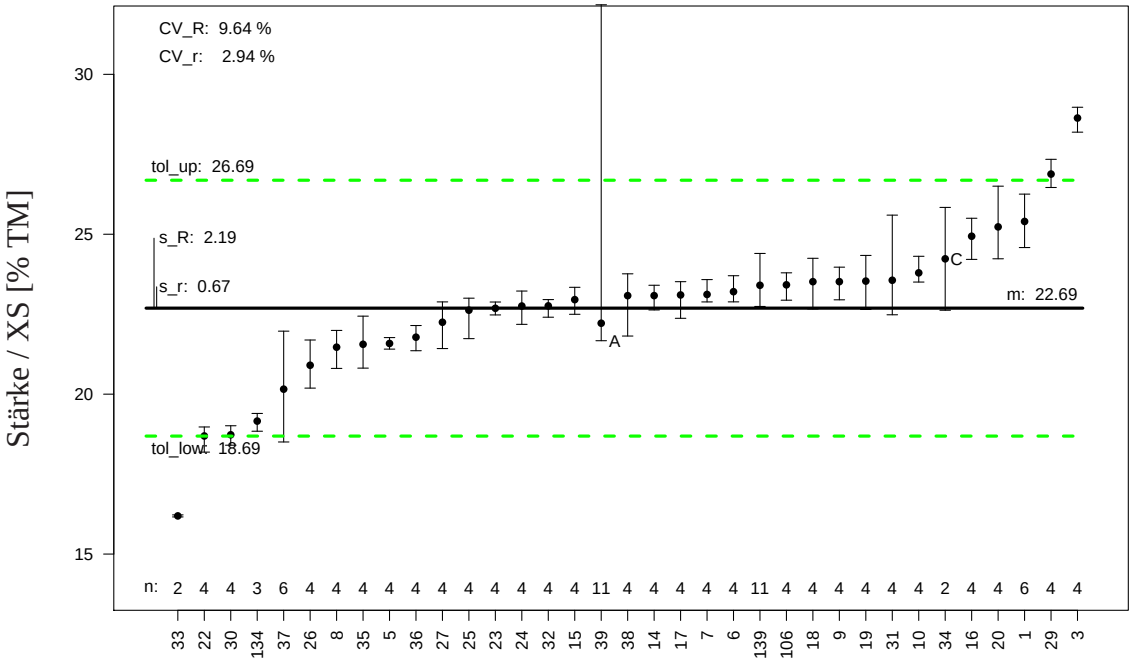
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

10.4 Einzelproben / Single Samples

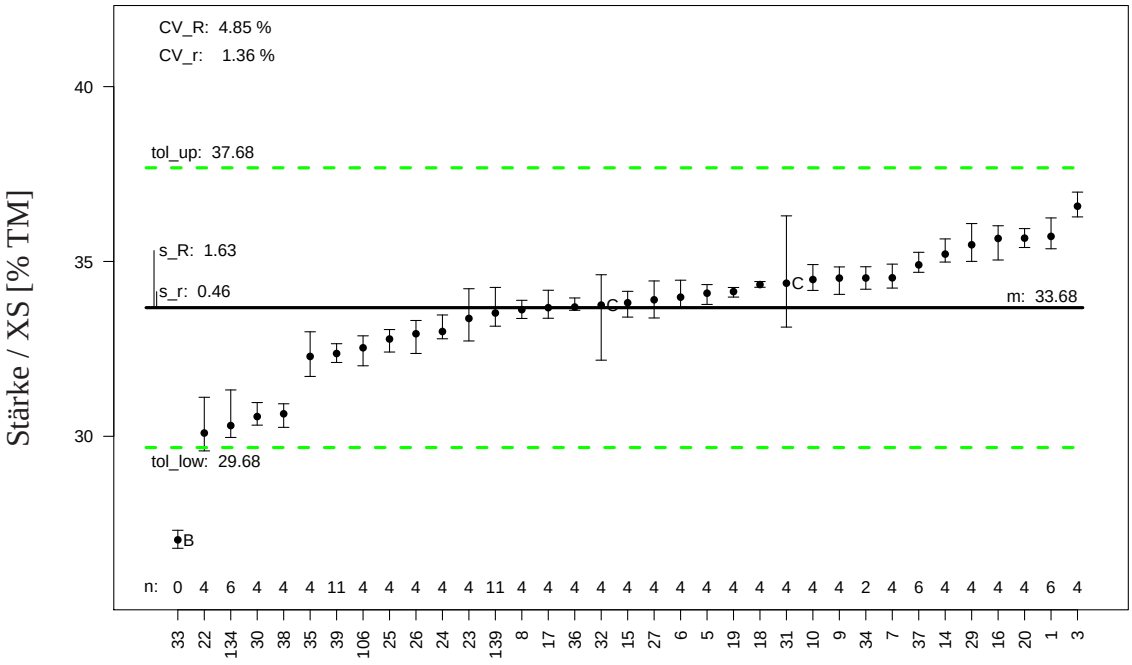
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

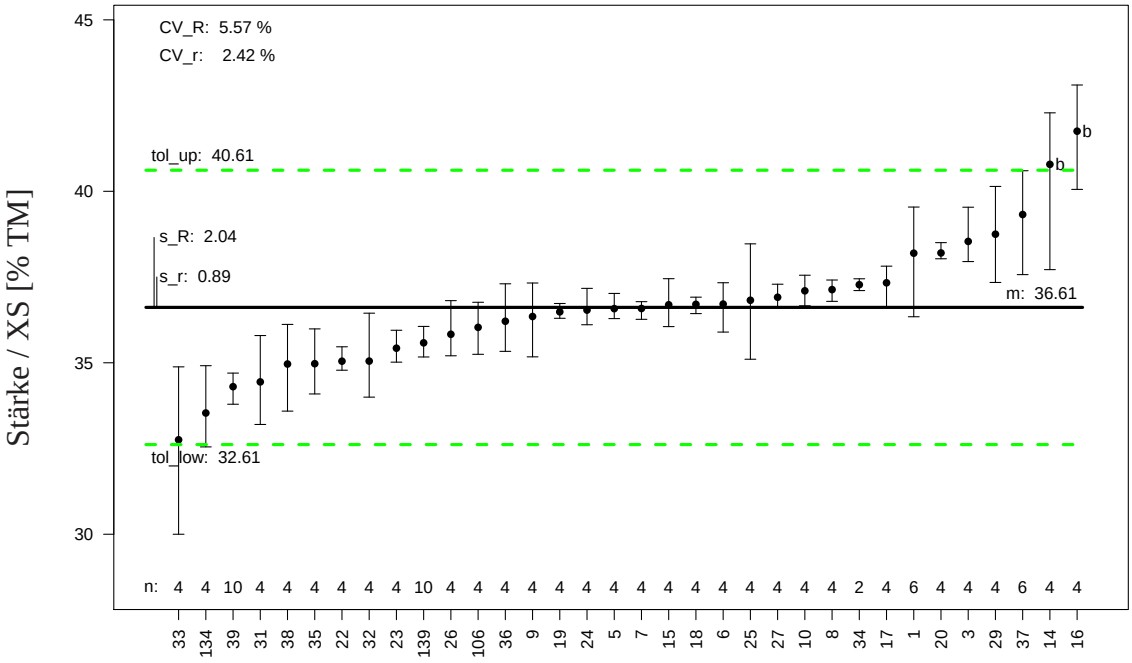
Probe/Sample 1901:



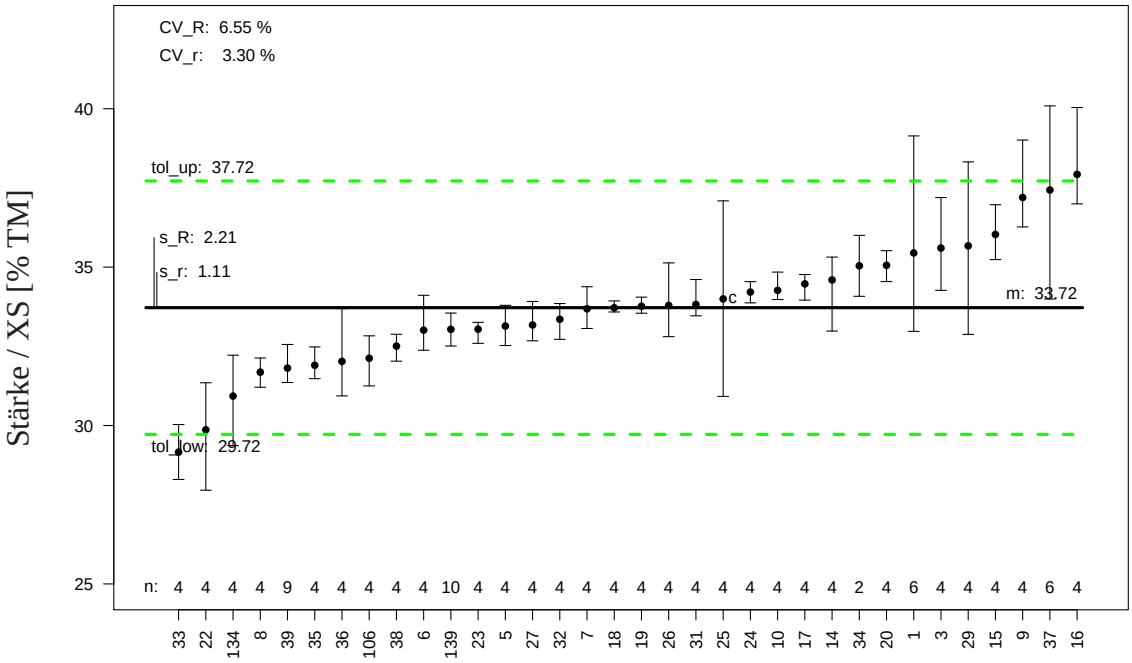
Probe/Sample 1902:



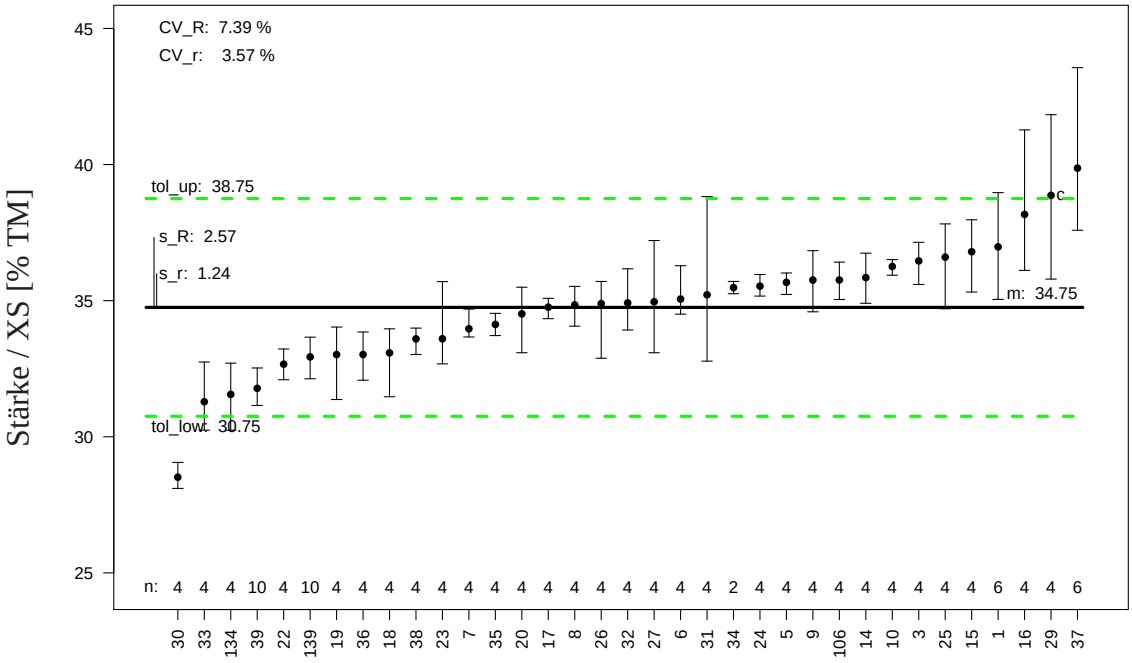
Probe/Sample 1903:



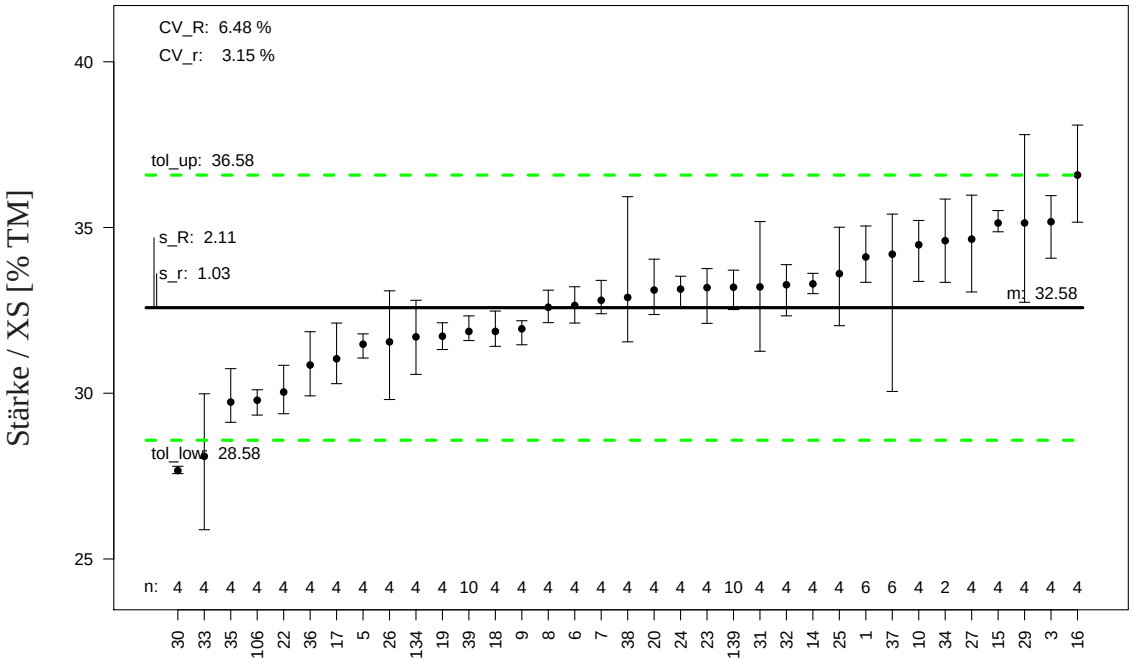
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



11 Merkmal / Constituent: Zucker / XZ

Einheit / Unit: % TM

11.1 Anmerkungen / Annotations

11.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

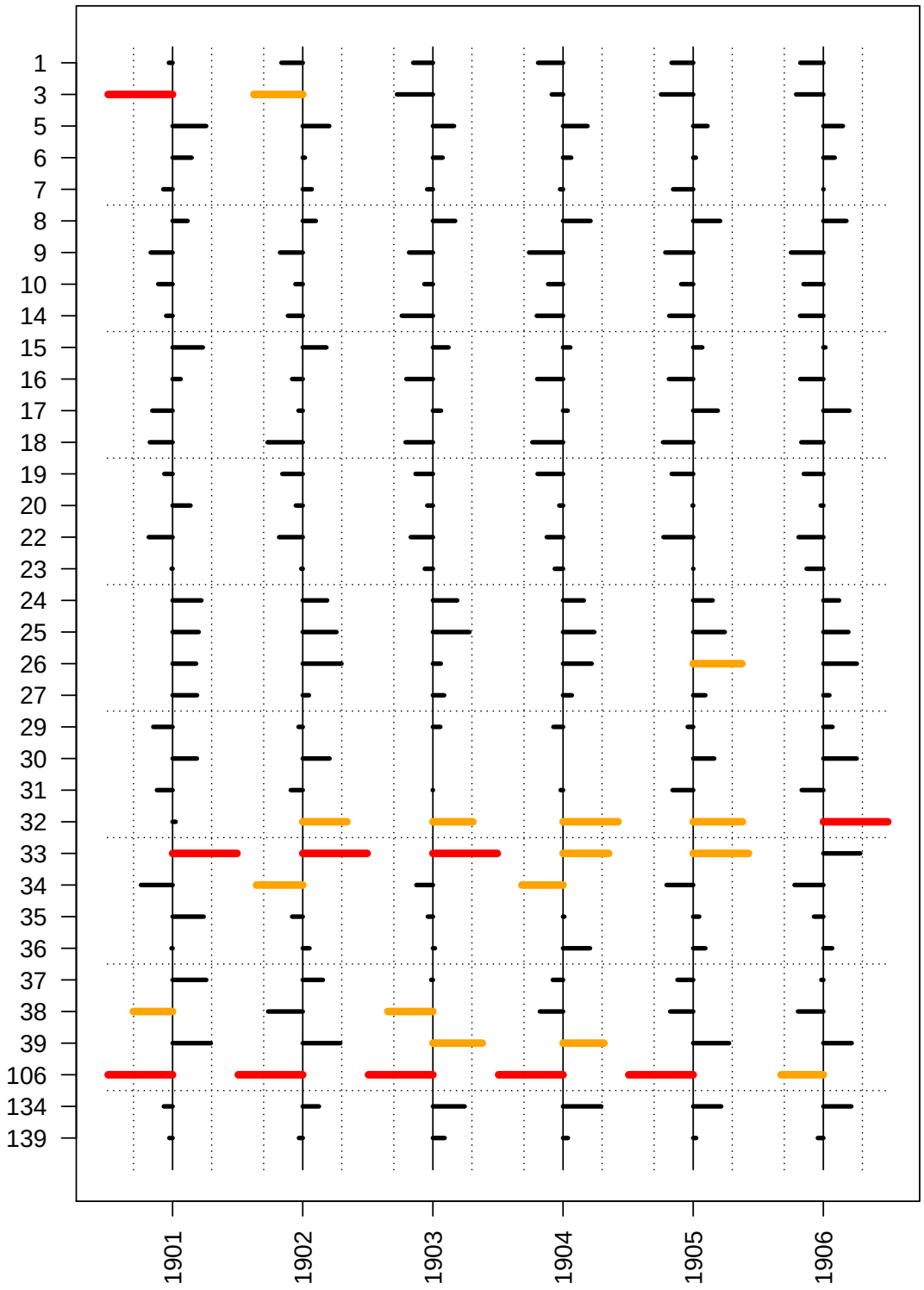
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 0.5 % TM

Quelle / Source: VDLUFA ASR

Zucker / XZ

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	5.16	-0.09	6.94	-0.55	4.31	-0.50	4.81	-0.64	5.10	-0.55	7.76	-0.59		
3	3.02	-2.23	6.23	-1.25	3.89	-0.92	5.16	-0.29	4.83	-0.82	7.65	-0.70		
5	6.11	0.86	8.16	0.68	5.36	0.54	6.08	0.63	6.03	0.37	8.85	0.50		
6	5.74	0.49	7.54	0.06	5.06	0.25	5.66	0.21	5.73	0.07	8.64	0.29		
7	5.01	-0.24	7.72	0.23	4.67	-0.15	5.38	-0.08	5.14	-0.51	8.35	0.00		
8	5.63	0.38	7.82	0.34	5.39	0.57	6.16	0.70	6.35	0.69	8.94	0.59		
9	4.69	-0.56	6.90	-0.58	4.20	-0.61	4.58	-0.87	4.94	-0.71	7.52	-0.83		
10	4.88	-0.37	7.30	-0.19	4.60	-0.22	5.07	-0.38	5.35	-0.31	7.84	-0.51		
14	5.09	-0.16	7.11	-0.38	4.02	-0.80	4.78	-0.67	5.04	-0.61	7.75	-0.60		
15	6.02	0.77	8.09	0.61	5.21	0.40	5.64	0.19	5.89	0.23	8.40	0.05		
16	5.46	0.21	7.21	-0.27	4.14	-0.68	4.79	-0.66	5.04	-0.62	7.76	-0.59		
17	4.73	-0.52	7.38	-0.11	5.02	0.21	5.57	0.12	6.29	0.63	9.02	0.67		
18	4.66	-0.58	6.58	-0.90	4.11	-0.70	4.67	-0.79	4.88	-0.77	7.78	-0.56		
19	5.04	-0.21	6.96	-0.52	4.37	-0.44	4.80	-0.65	5.11	-0.55	7.85	-0.50		
20	5.71	0.46	7.31	-0.18	4.67	-0.14	5.36	-0.10	5.64	-0.02	8.28	-0.07		
22	4.64	-0.61	6.88	-0.60	4.25	-0.57	5.04	-0.42	4.90	-0.76	7.71	-0.64		
23	5.23	-0.02	7.45	-0.04	4.61	-0.21	5.24	-0.21	5.66	0.00	7.92	-0.43		
24	5.99	0.74	8.11	0.63	5.44	0.62	5.99	0.53	6.16	0.50	8.75	0.40		
25	5.92	0.67	8.35	0.86	5.75	0.93	6.25	0.80	6.47	0.81	8.99	0.64		
26	5.85	0.60	8.48	0.99	5.02	0.20	6.19	0.73	6.91	1.25	9.21	0.86		
27	5.88	0.63	7.64	0.16	5.10	0.29	5.68	0.22	5.97	0.31	8.50	0.16		
29	4.76	-0.49	7.38	-0.11	5.00	0.19	5.21	-0.25	5.52	-0.14	8.58	0.24		
30	5.87	0.62	8.17	0.69					6.20	0.54	9.20	0.85		
31	4.85	-0.40	7.18	-0.31	4.81	-0.00	5.39	-0.06	5.13	-0.53	7.79	-0.55		
32	5.33	0.08	8.62	1.13	5.84	1.02	6.86	1.41	6.92	1.26	9.94	1.60		
33	6.78	1.53	9.20	1.72	6.45	1.63	6.62	1.17	7.07	1.42	9.30	0.95		
34	4.44	-0.81	6.30	-1.18	4.39	-0.42	4.40	-1.05	4.98	-0.68	7.61	-0.74		
35	6.05	0.80	7.21	-0.27	4.68	-0.13	5.48	0.03	5.81	0.15	8.11	-0.24		
36	5.22	-0.03	7.66	0.17	4.87	0.05	6.14	0.69	5.97	0.31	8.58	0.23		
37	6.11	0.86	8.00	0.52	4.77	-0.04	5.19	-0.26	5.26	-0.40	8.30	-0.05		
38	4.24	-1.01	6.60	-0.89	3.66	-1.15	4.86	-0.59	5.07	-0.59	7.70	-0.65		
39	6.23	0.98	8.45	0.96	6.08	1.26	6.50	1.05	6.58	0.92	9.07	0.73		
106	3.24	-2.01	5.75	-1.73	3.20	-1.61	3.84	-1.62	4.00	-1.66	7.27	-1.08		
134	5.02	-0.23	7.90	0.41	5.63	0.81	6.43	0.98	6.38	0.72	9.07	0.72		
139	5.17	-0.08	7.39	-0.10	5.12	0.30	5.58	0.12	5.73	0.08	8.21	-0.14		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

11.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	154	158	150	149	154	154	
p_1	35	35	34	34	35	35	
m	5.25	7.48	4.81	5.45	5.66	8.35	
s_r	0.28	0.25	0.26	0.38	0.31	0.32	
CV_r	5.38	3.40	5.44	6.89	5.39	3.79	
r	0.80	0.72	0.74	1.06	0.86	0.90	
s_R	0.81	0.76	0.76	0.77	0.75	0.69	0.50
CV_R	15.50	10.09	15.70	14.06	13.29	8.22	
R	2.30	2.14	2.14	2.17	2.13	1.94	1.42
HORRAT[1]	4.97	3.41	4.97	4.54	4.31	2.83	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

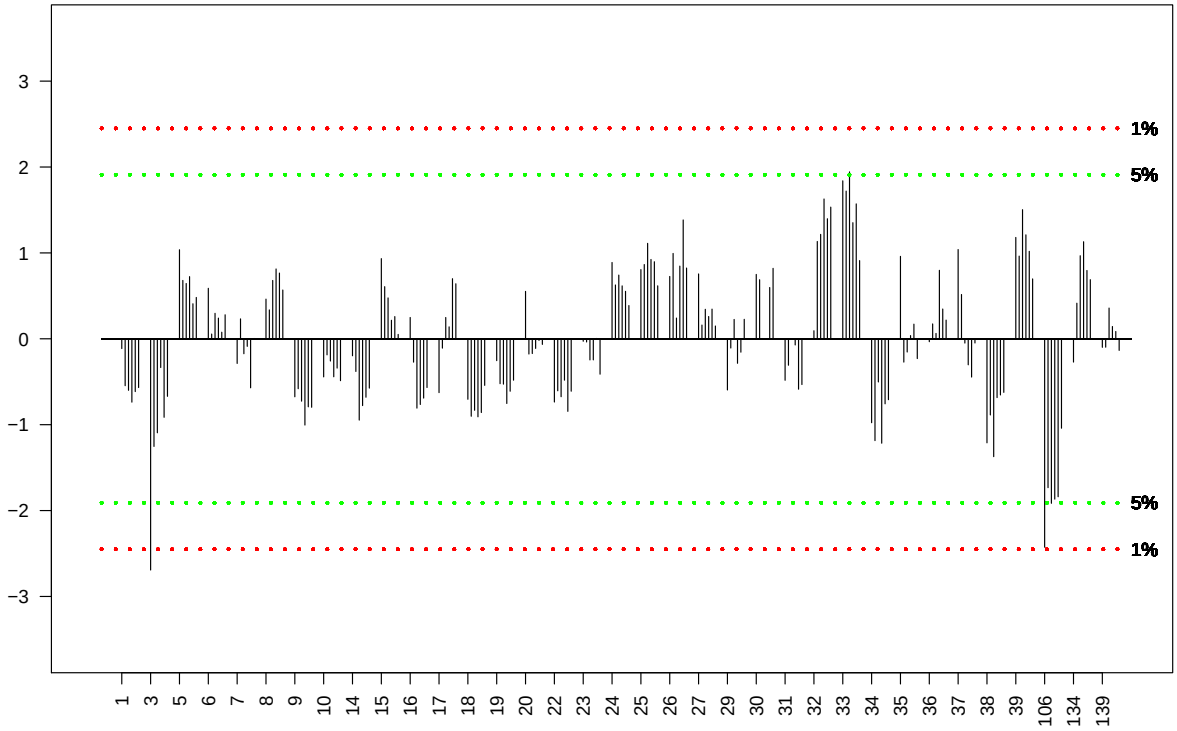
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3	b					
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26	C	C	c	C	C	C
27						
29						c
30						
31		C			C	
32			C			
33						
34						
35						
36						
37						
38						
39						
106	b					
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

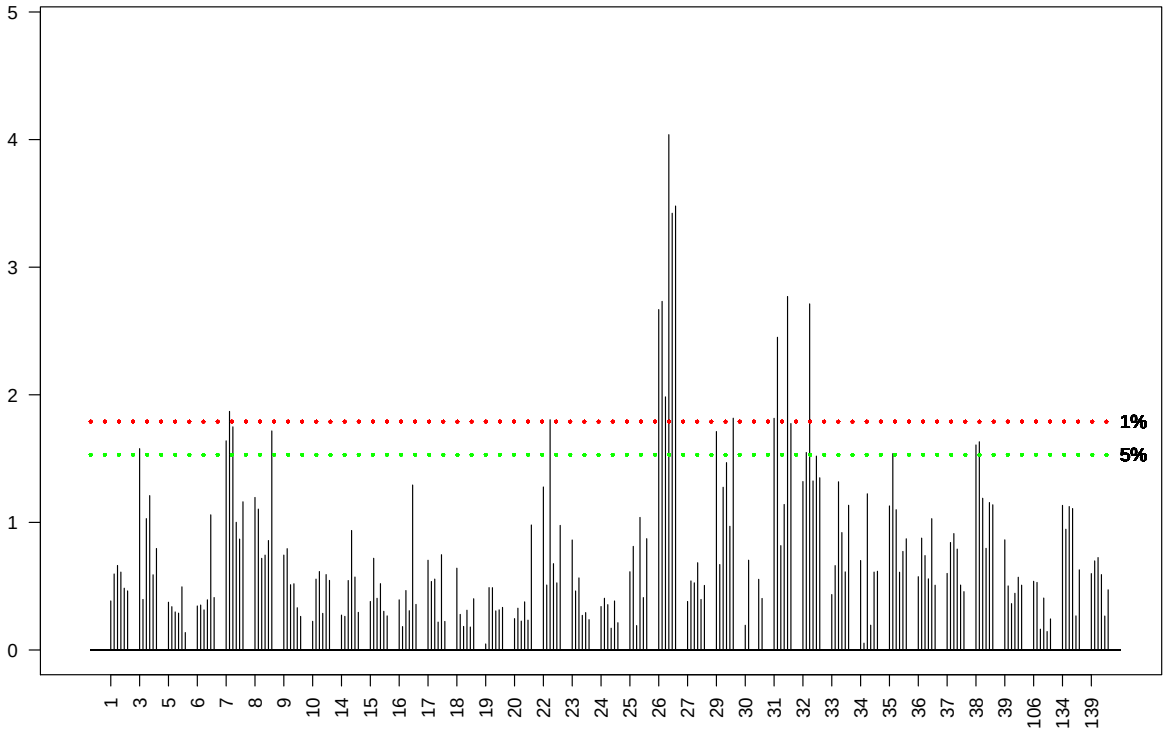
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

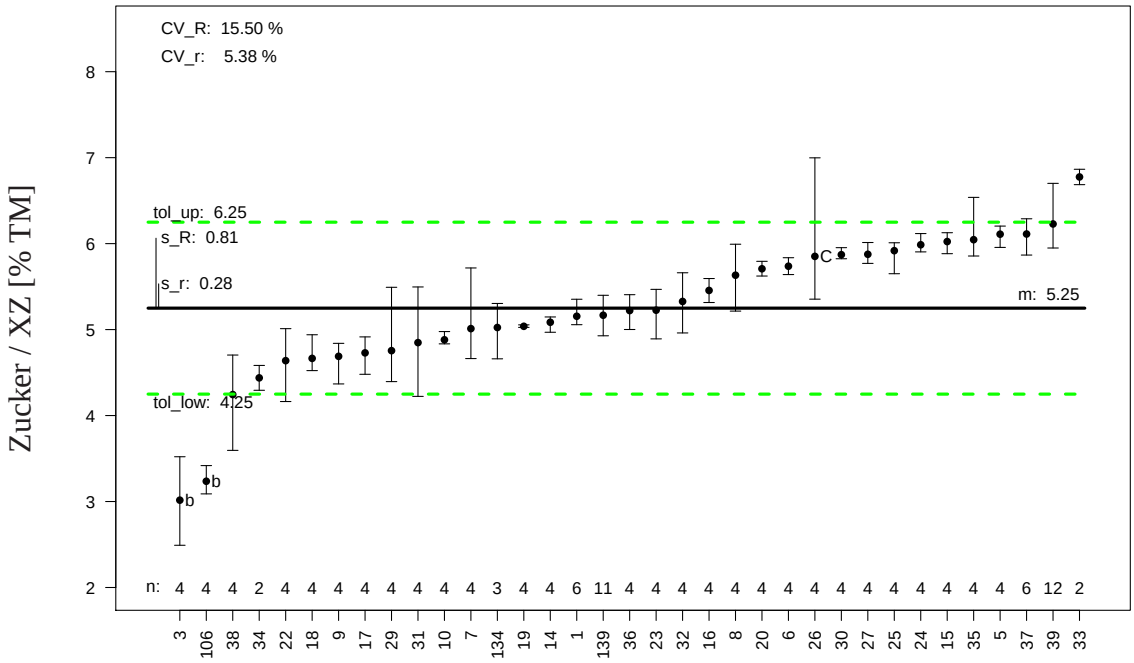
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

11.4 Einzelproben / Single Samples

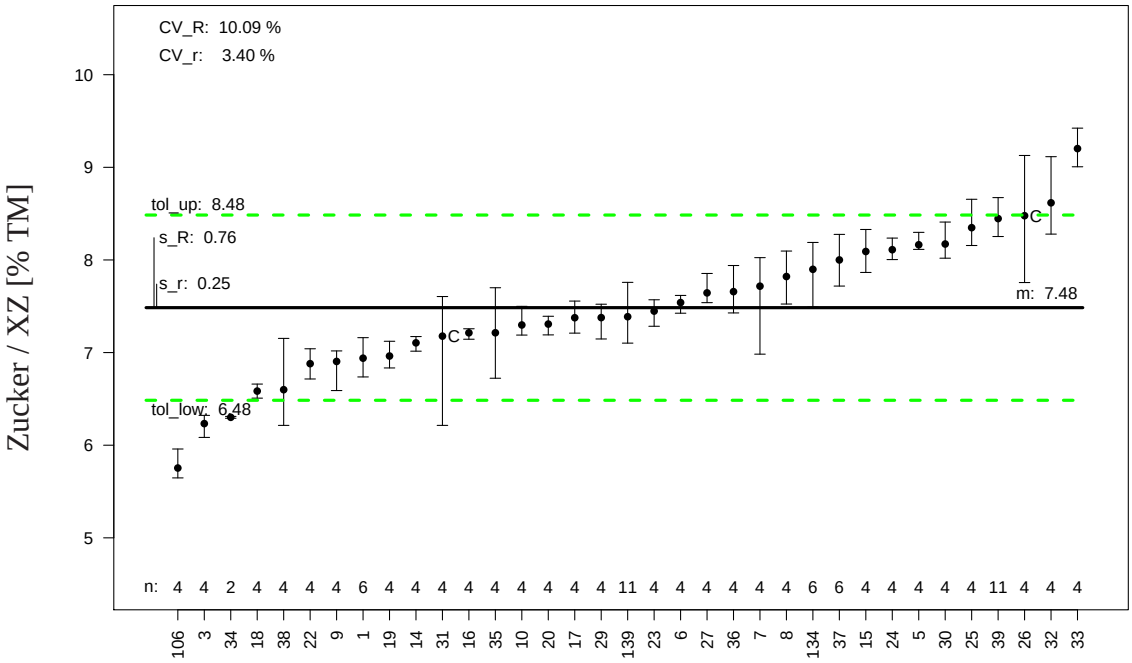
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

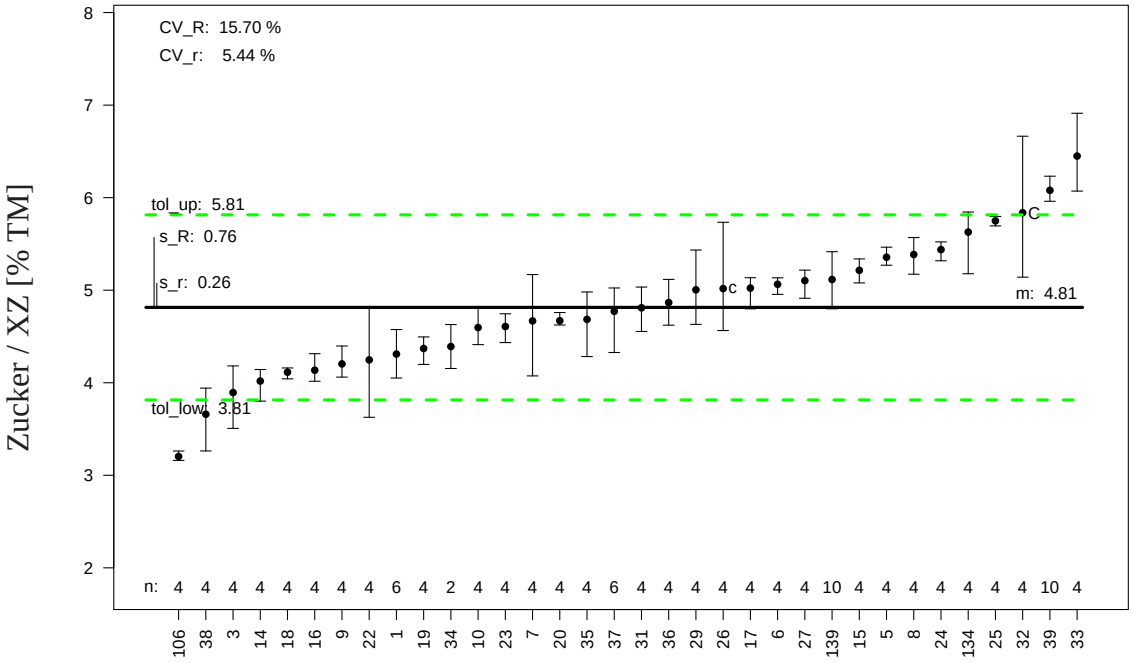
Probe/Sample 1901:



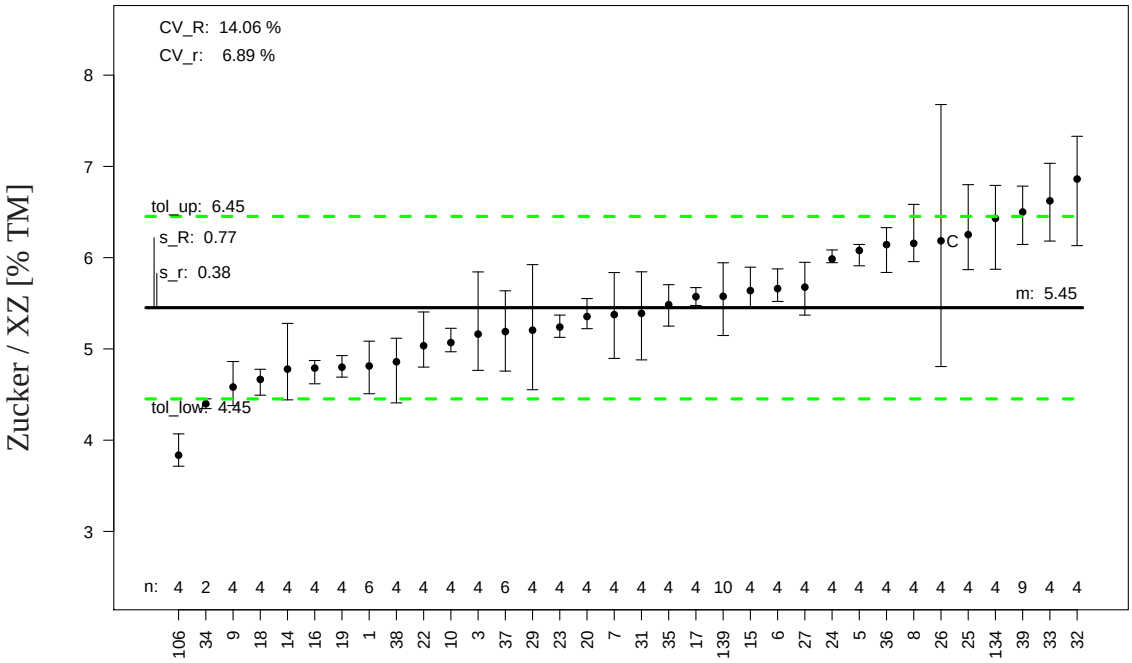
Probe/Sample 1902:



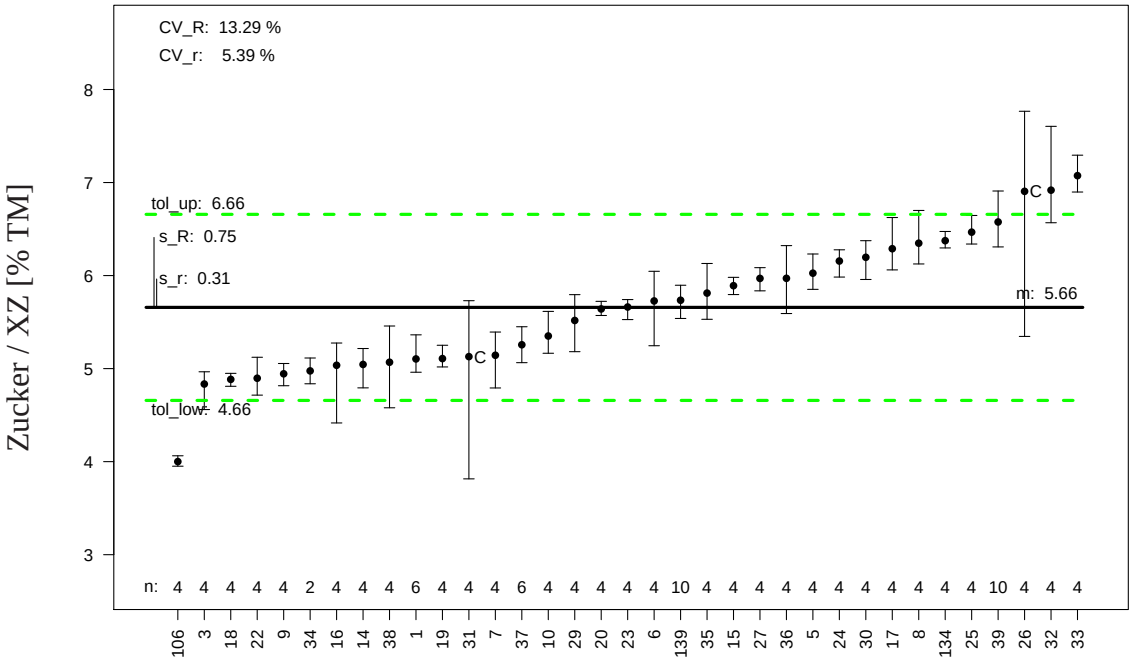
Probe/Sample 1903:



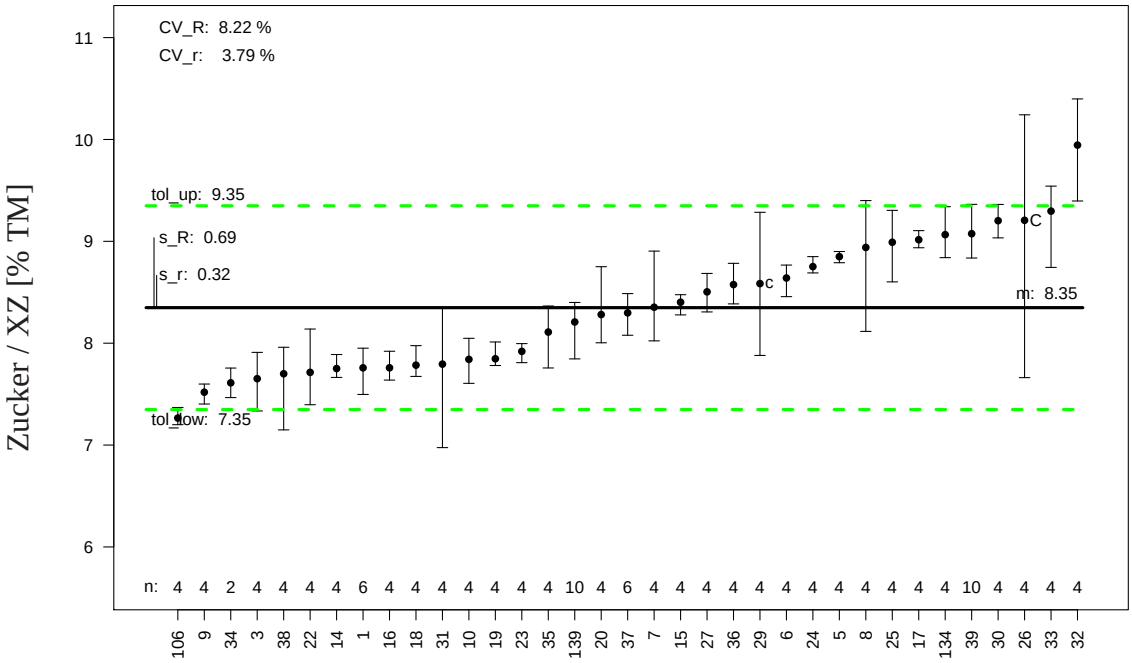
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



12 Merkmal / Constituent: aNDFom

Einheit / Unit: % TM

12.1 Anmerkungen / Annotations

12.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

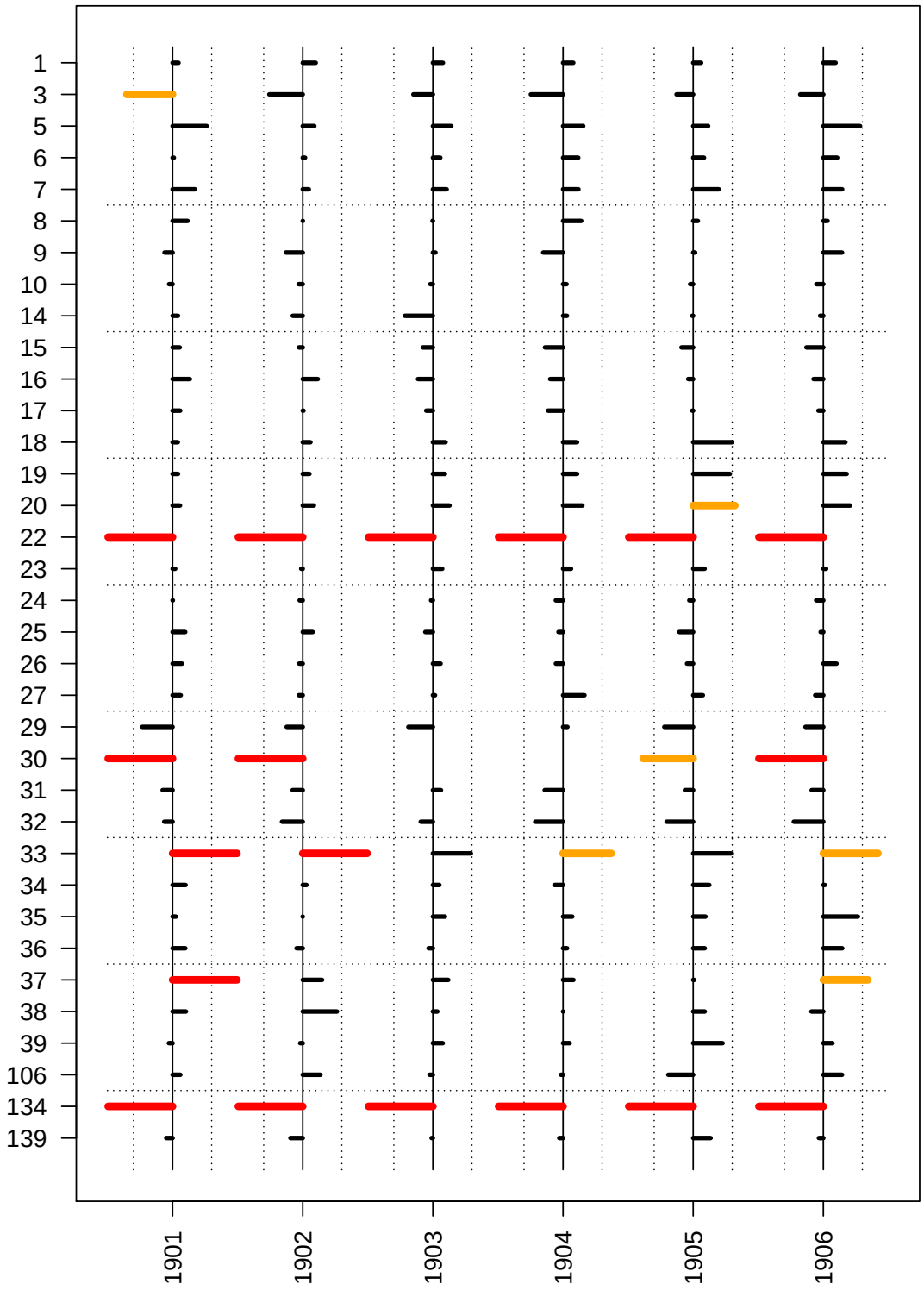
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.75 % TM

Quelle / Source: VDLUFA ASR

aNDFom

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

aNDFom

Systematische Labordifferenz / lab bias

Probe/Sample Labor/Lab	1901		1902		1903		1904		1905		1906		Differenz	
	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	56.11	0.53	43.22	1.16	43.79	0.90	46.39	0.92	44.28	0.71	43.86	1.10		
3	51.47	-4.10	39.06	-3.00	41.15	-1.75	42.59	-2.89	42.07	-1.49	40.68	-2.08		
5	58.63	3.06	43.09	1.04	44.55	1.65	47.28	1.81	44.91	1.34	46.05	3.29		
6	55.69	0.11	42.26	0.21	43.56	0.66	46.84	1.36	44.54	0.97	44.00	1.24		
7	57.60	2.02	42.60	0.54	44.13	1.23	46.86	1.38	45.87	2.30	44.45	1.69		
8	56.93	1.35	42.06	0.01	42.86	-0.03	47.11	1.63	43.99	0.42	43.13	0.38		
9	54.85	-0.72	40.53	-1.52	43.13	0.23	43.70	-1.78	43.74	0.17	44.44	1.68		
10	55.26	-0.31	41.68	-0.37	42.67	-0.23	45.79	0.32	43.29	-0.27	42.13	-0.63		
14	56.06	0.49	41.15	-0.90	40.38	-2.51	45.83	0.35	43.48	-0.09	42.47	-0.29		
15	56.22	0.64	41.71	-0.35	41.99	-0.91	43.85	-1.62	42.51	-1.05	41.24	-1.52		
16	57.13	1.55	43.40	1.35	41.56	-1.34	44.32	-1.16	43.12	-0.45	41.88	-0.88		
17	56.26	0.68	42.12	0.07	42.30	-0.60	44.13	-1.35	43.48	-0.08	42.31	-0.44		
18	56.05	0.47	42.75	0.69	44.03	1.14	46.73	1.26	47.04	3.47	44.73	1.98		
19	56.06	0.48	42.65	0.60	43.98	1.08	46.74	1.26	46.86	3.29	44.85	2.09		
20	56.24	0.67	43.05	1.00	44.39	1.49	47.21	1.74	47.30	3.74	45.17	2.41		
22	48.02	-7.56	34.85	-7.21	35.07	-7.82	39.31	-6.17	36.57	-6.99	35.77	-6.99		
23	55.81	0.23	41.91	-0.14	43.73	0.83	46.19	0.72	44.59	1.03	43.01	0.25		
24	55.60	0.02	41.77	-0.28	42.73	-0.17	44.82	-0.65	43.22	-0.35	42.11	-0.65		
25	56.71	1.13	42.95	0.90	42.21	-0.68	45.07	-0.41	42.31	-1.25	42.52	-0.24		
26	56.42	0.84	41.73	-0.32	43.59	0.69	44.83	-0.65	43.01	-0.55	43.94	1.18		
27	56.31	0.73	41.70	-0.35	43.09	0.19	47.40	1.92	44.43	0.87	42.03	-0.73		
29	52.86	-2.72	40.61	-1.44	40.70	-2.20	45.87	0.40	40.98	-2.59	41.15	-1.61		
30	48.50	-7.07	34.29	-7.76					39.08	-4.49	37.10	-5.66		
31	54.68	-0.89	41.14	-0.91	43.62	0.72	43.83	-1.65	42.82	-0.75	41.71	-1.05		
32	54.83	-0.75	40.19	-1.86	41.80	-1.09	42.98	-2.49	41.18	-2.38	40.11	-2.65		
33	61.49	5.92	47.57	5.52	46.30	3.40	49.80	4.32	46.95	3.39	47.65	4.89		
34	56.74	1.17	42.39	0.34	43.48	0.58	44.71	-0.77	45.01	1.45	42.89	0.13		
35	55.88	0.30	42.04	-0.01	43.98	1.08	46.30	0.83	44.67	1.11	45.86	3.10		
36	56.72	1.14	41.50	-0.56	42.51	-0.38	45.83	0.36	44.60	1.04	44.45	1.69		
37	61.15	5.57	43.79	1.73	44.27	1.38	46.41	0.93	43.66	0.09	46.75	3.99		
38	56.78	1.20	45.12	3.07	43.30	0.40	45.48	0.00	44.60	1.04	41.68	-1.07		
39	55.24	-0.33	41.82	-0.23	43.78	0.89	46.07	0.60	46.21	2.64	43.58	0.82		
106	56.27	0.70	43.64	1.59	42.60	-0.30	45.29	-0.18	41.33	-2.23	44.43	1.68		
134	48.74	-6.84	35.59	-6.46	36.65	-6.25	37.88	-7.60	37.95	-5.62	36.05	-6.71		
139	55.01	-0.57	40.95	-1.10	42.78	-0.11	45.14	-0.34	45.13	1.56	42.36	-0.40		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

12.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	153	150	146	145	154	154	
p_1	35	33	33	33	35	35	
m	55.58	42.05	42.90	45.48	43.57	42.76	
s_r	0.73	0.45	0.84	1.08	1.07	0.97	
CV_r	1.32	1.06	1.97	2.38	2.45	2.27	
r	2.08	1.26	2.39	3.07	3.02	2.75	
s_R	2.73	2.01	1.75	2.01	2.56	2.71	1.75
CV_R	4.92	4.78	4.08	4.41	5.87	6.35	
R	7.73	5.68	4.95	5.68	7.24	7.68	4.95
HORRAT[1]	2.25	2.10	1.80	1.96	2.59	2.79	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

aNDFom

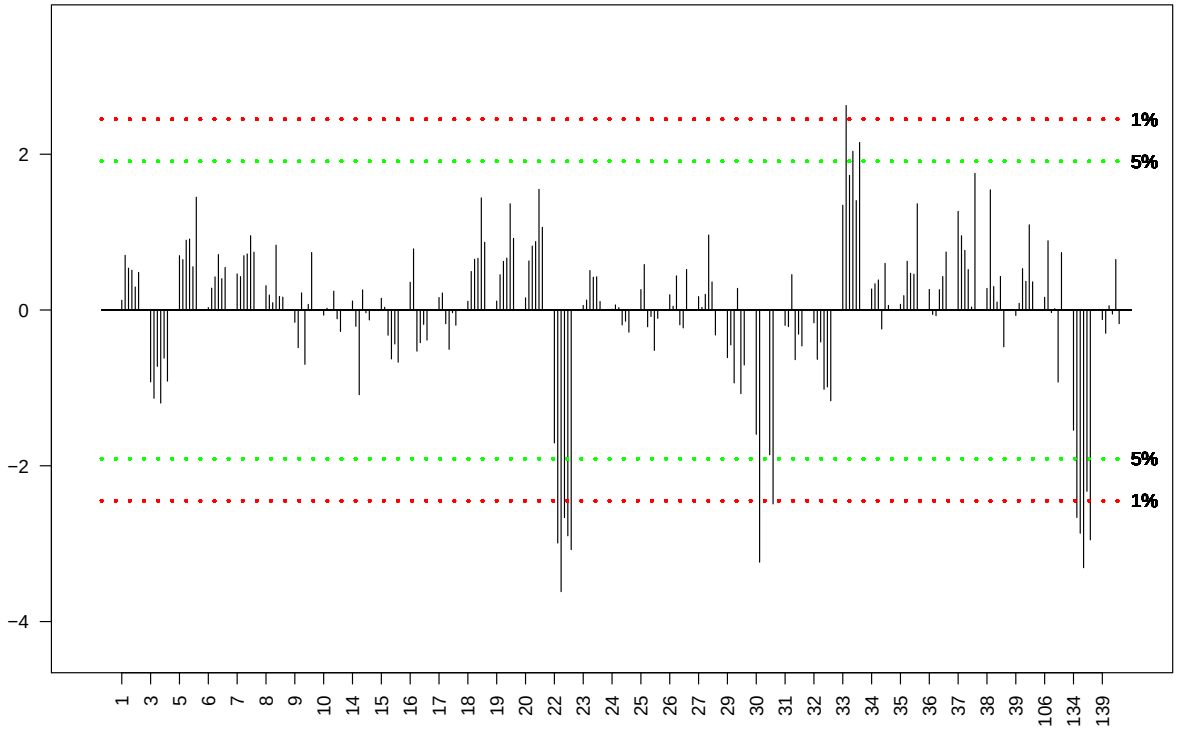
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22	b	B	B	B	b	b
23						
24						
25						
26		C				C
27						
29				c		
30	b	B				
31						
32						
33						
34	C					
35						
36						
37						
38						
39	A					
106		C				
134		B	B	B	b	b
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

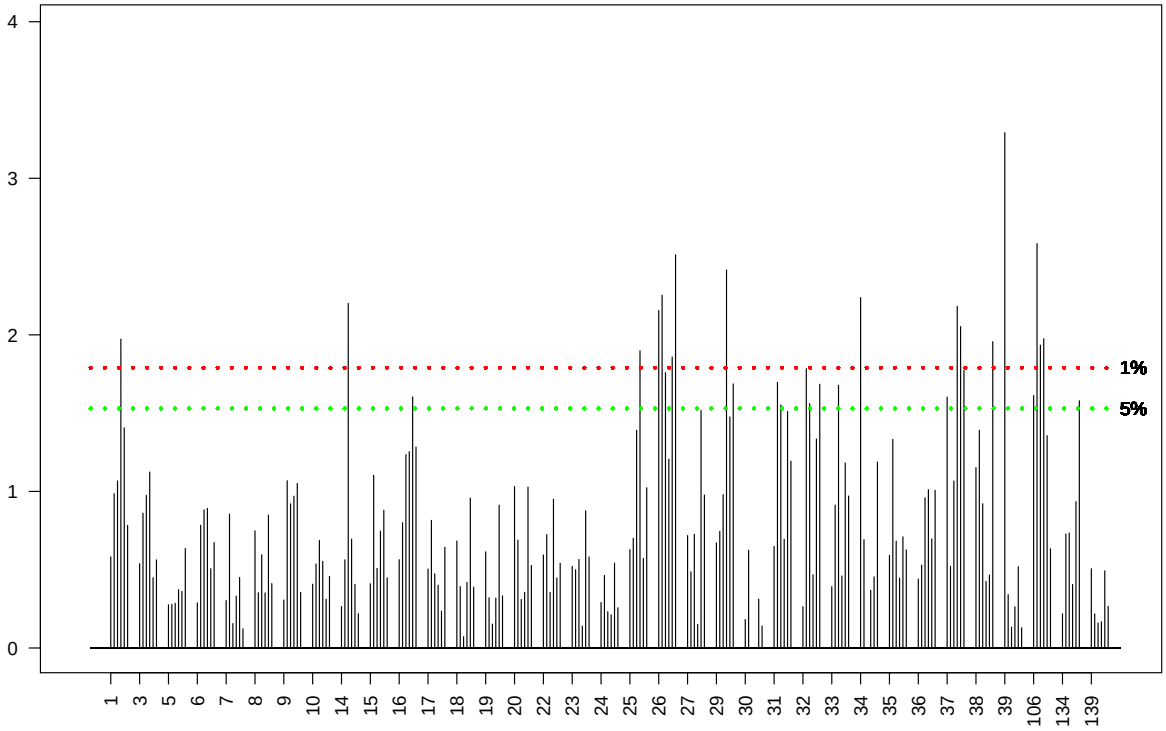
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

aNDFom

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

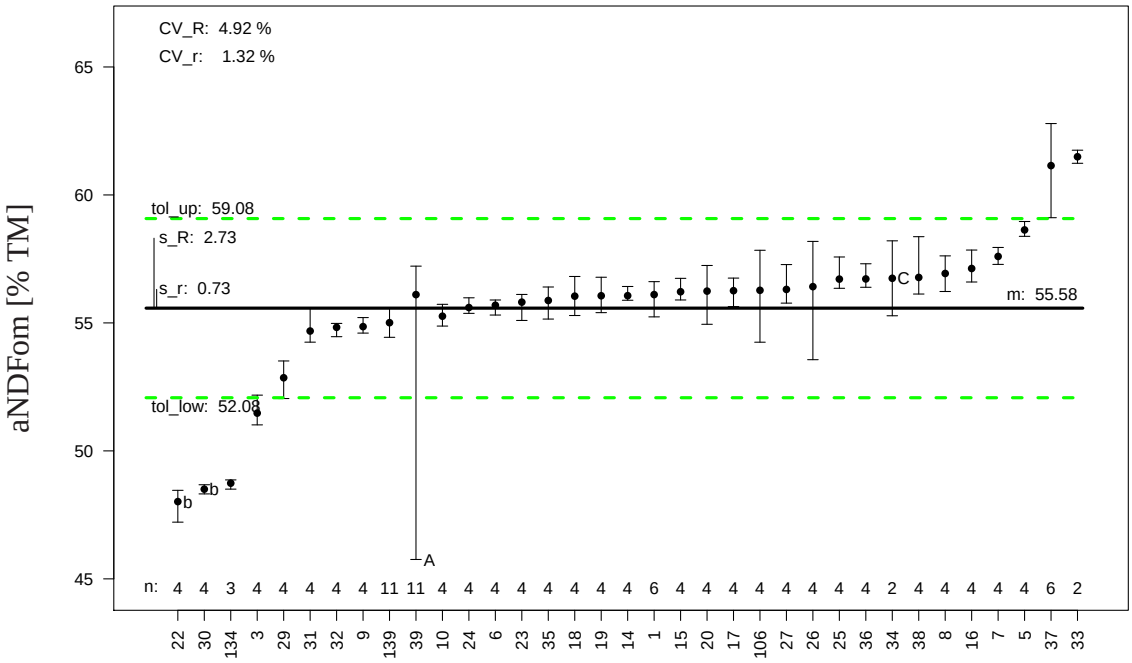
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

12.4 Einzelproben / Single Samples

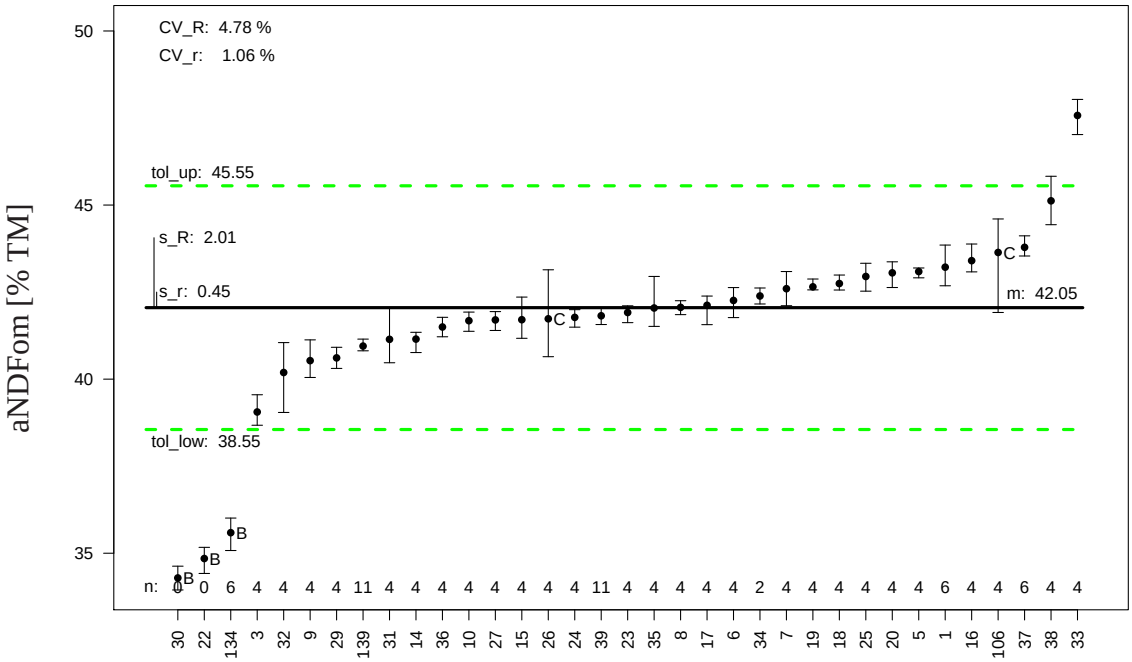
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

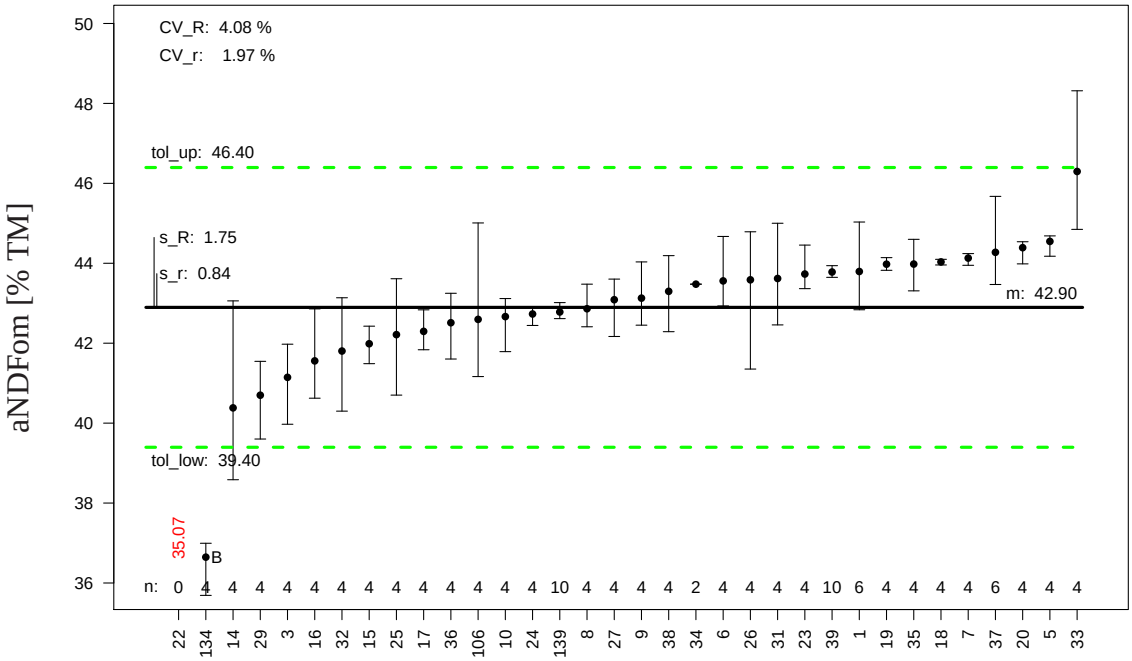
Probe/Sample 1901:



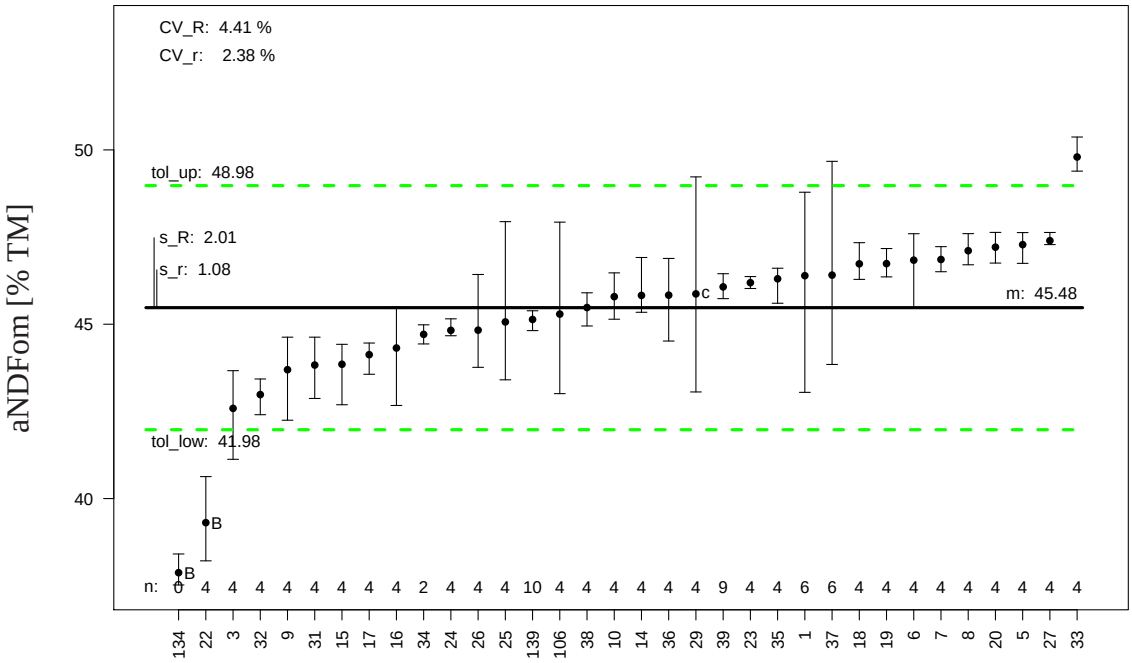
Probe/Sample 1902:



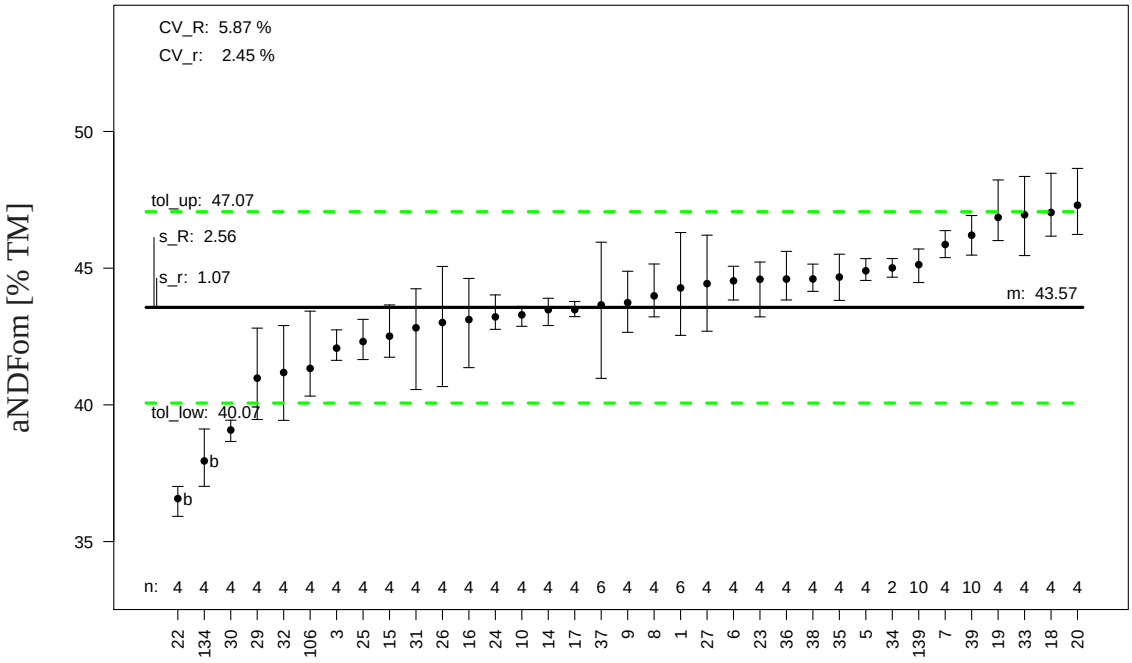
Probe/Sample 1903:



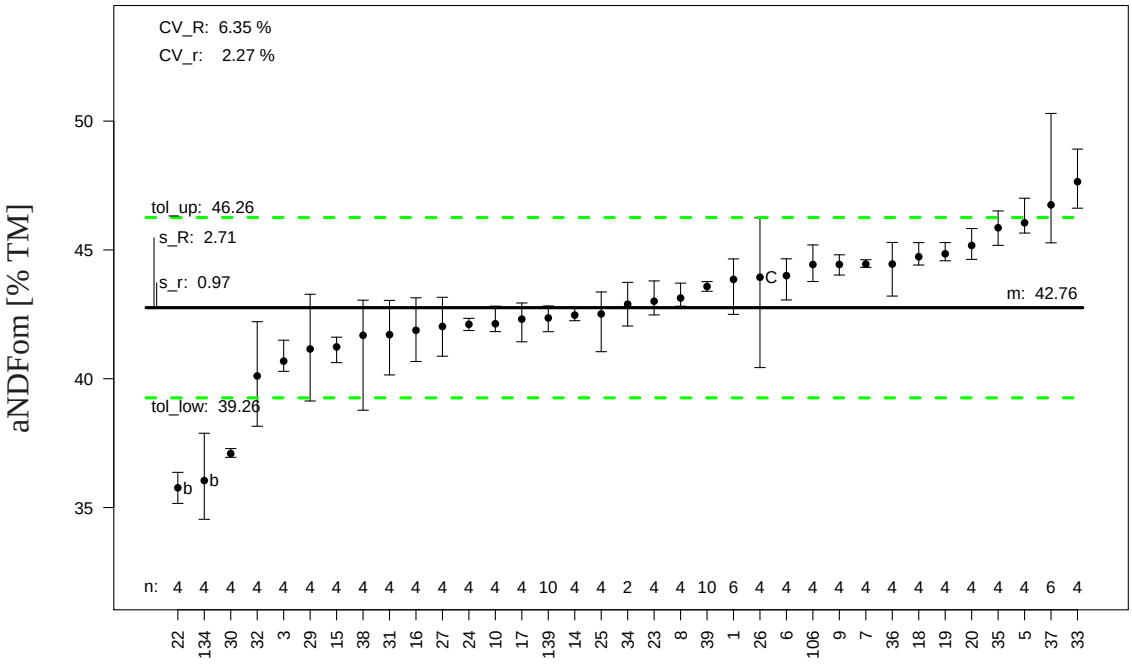
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



13 Merkmal / Constituent: ADFom

Einheit / Unit: % TM

13.1 Anmerkungen / Annotations

13.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

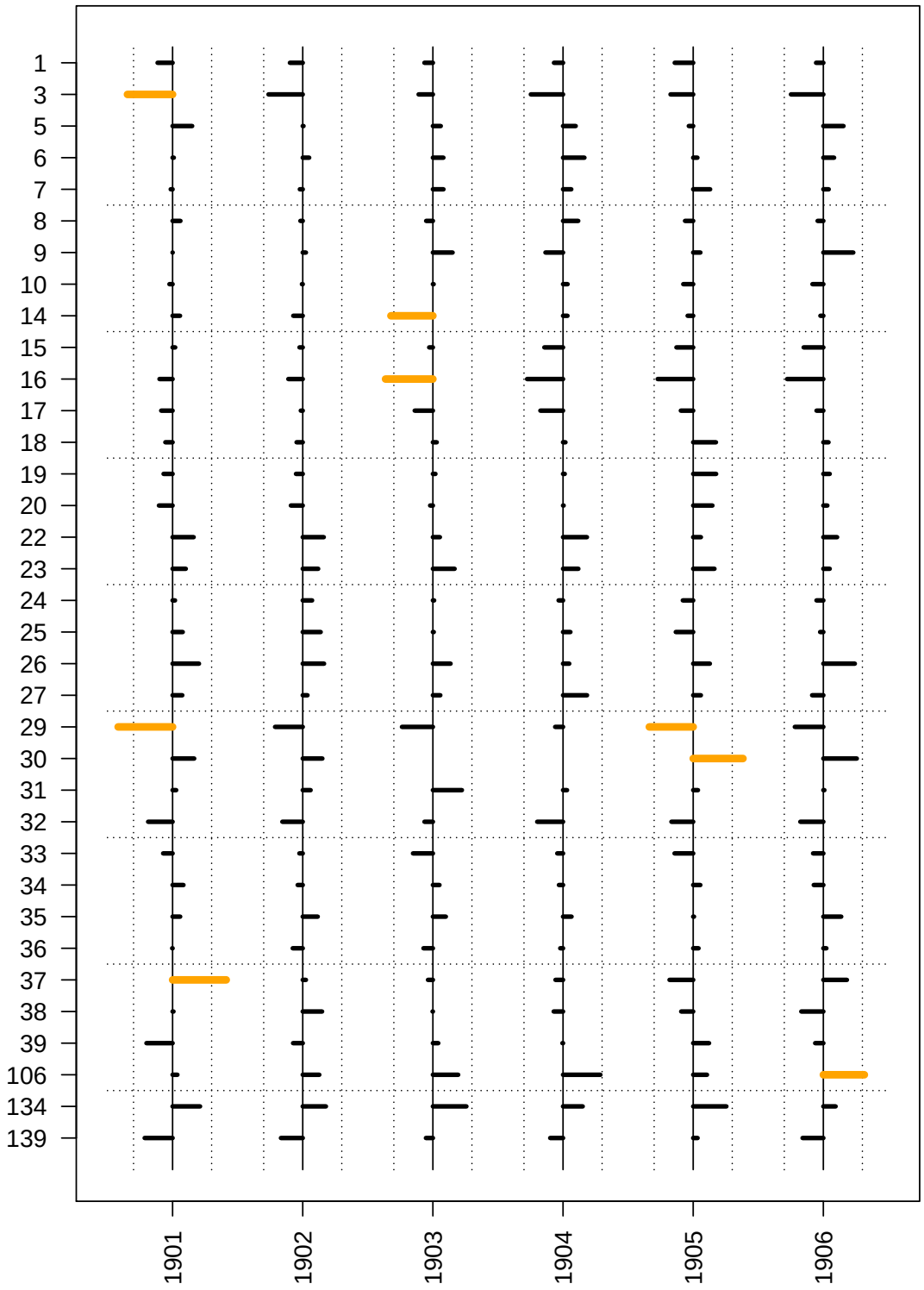
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.1 % TM

Quelle / Source: VDLUFA ASR

ADFom

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	29.41	-0.84	21.28	-0.72	22.01	-0.48	22.39	-0.51	22.26	-1.04	22.74	-0.41		
3	27.71	-2.54	20.08	-1.93	21.68	-0.80	21.09	-1.81	22.03	-1.28	21.33	-1.82		
5	31.36	1.10	22.05	0.04	22.92	0.44	23.61	0.71	23.06	-0.25	24.29	1.14		
6	30.32	0.07	22.36	0.36	23.07	0.59	24.11	1.20	23.54	0.24	23.76	0.60		
7	30.15	-0.10	21.84	-0.16	23.08	0.59	23.36	0.46	24.26	0.95	23.45	0.30		
8	30.70	0.44	21.87	-0.13	22.11	-0.38	23.76	0.86	22.84	-0.46	22.83	-0.32		
9	30.26	0.00	22.18	0.18	23.59	1.11	21.91	-0.99	23.71	0.40	24.84	1.69		
10	30.08	-0.18	21.96	-0.05	22.53	0.04	23.16	0.25	22.75	-0.56	22.54	-0.61		
14	30.67	0.42	21.47	-0.53	20.12	-2.37	23.15	0.25	22.99	-0.31	22.99	-0.16		
15	30.40	0.15	21.82	-0.18	22.28	-0.21	21.85	-1.05	22.36	-0.94	22.04	-1.11		
16	29.52	-0.74	21.19	-0.81	19.81	-2.67	20.88	-2.02	21.30	-2.00	21.11	-2.04		
17	29.61	-0.64	21.89	-0.11	21.46	-1.02	21.62	-1.28	22.61	-0.70	22.77	-0.38		
18	29.85	-0.41	21.66	-0.35	22.70	0.22	23.04	0.14	24.58	1.28	23.44	0.29		
19	29.75	-0.51	21.62	-0.38	22.62	0.14	23.00	0.10	24.59	1.29	23.51	0.36		
20	29.48	-0.77	21.34	-0.67	22.33	-0.15	22.94	0.03	24.39	1.08	23.38	0.22		
22	31.44	1.19	23.19	1.18	22.88	0.39	24.25	1.34	23.74	0.43	23.93	0.77		
23	31.00	0.74	22.87	0.87	23.71	1.22	23.76	0.86	24.50	1.20	23.51	0.36		
24	30.39	0.14	22.53	0.53	22.55	0.07	22.65	-0.25	22.72	-0.58	22.77	-0.39		
25	30.82	0.57	23.01	1.01	22.53	0.05	23.32	0.41	22.32	-0.98	22.97	-0.18		
26	31.74	1.49	23.20	1.20	23.48	0.99	23.25	0.35	24.24	0.94	24.93	1.77		
27	30.80	0.55	22.27	0.27	22.90	0.42	24.25	1.35	23.73	0.43	22.52	-0.63		
29	27.19	-3.07	20.44	-1.56	20.74	-1.74	22.46	-0.44	20.83	-2.47	21.55	-1.61		
30	31.47	1.22	23.11	1.10					26.11	2.81	25.04	1.88		
31	30.46	0.20	22.45	0.44	24.12	1.63	23.12	0.22	23.57	0.27	23.21	0.06		
32	28.88	-1.38	20.85	-1.15	22.01	-0.47	21.45	-1.45	22.08	-1.23	21.86	-1.30		
33	29.72	-0.53	21.81	-0.19	21.36	-1.12	22.58	-0.32	22.25	-1.05	22.57	-0.58		
34	30.87	0.61	21.72	-0.28	22.85	0.37	22.67	-0.23	23.70	0.40	22.61	-0.54		
35	30.68	0.43	22.85	0.84	23.21	0.73	23.38	0.48	23.35	0.05	24.16	1.01		
36	30.23	-0.02	21.44	-0.56	21.95	-0.53	22.74	-0.16	23.60	0.30	23.32	0.17		
37	33.28	3.02	22.18	0.18	22.21	-0.27	22.48	-0.43	21.97	-1.33	24.48	1.33		
38	30.30	0.05	23.09	1.09	22.47	-0.02	22.38	-0.53	22.63	-0.67	21.91	-1.24		
39	28.78	-1.47	21.46	-0.54	22.79	0.30	22.87	-0.03	24.20	0.89	22.69	-0.46		
106	30.52	0.27	22.93	0.93	23.91	1.42	25.01	2.10	24.08	0.78	25.46	2.31		
134	31.80	1.55	23.31	1.31	24.37	1.89	24.01	1.11	25.17	1.87	23.84	0.69		
139	28.68	-1.57	20.78	-1.23	22.09	-0.39	22.18	-0.72	23.55	0.25	21.98	-1.17		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

13.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	153	158	150	149	154	154	
p_1	35	35	34	34	35	35	
m	30.25	22.00	22.48	22.90	23.30	23.15	
s_r	0.50	0.28	0.60	0.71	0.78	0.58	
CV_r	1.65	1.26	2.65	3.09	3.35	2.52	
r	1.42	0.78	1.69	2.00	2.21	1.65	
s_R	1.28	0.88	1.11	1.10	1.30	1.18	1.10
CV_R	4.25	3.99	4.92	4.79	5.56	5.10	
R	3.64	2.49	3.13	3.11	3.67	3.34	3.11
HORRAT[1]	1.78	1.59	1.97	1.92	2.23	2.05	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

ADFom

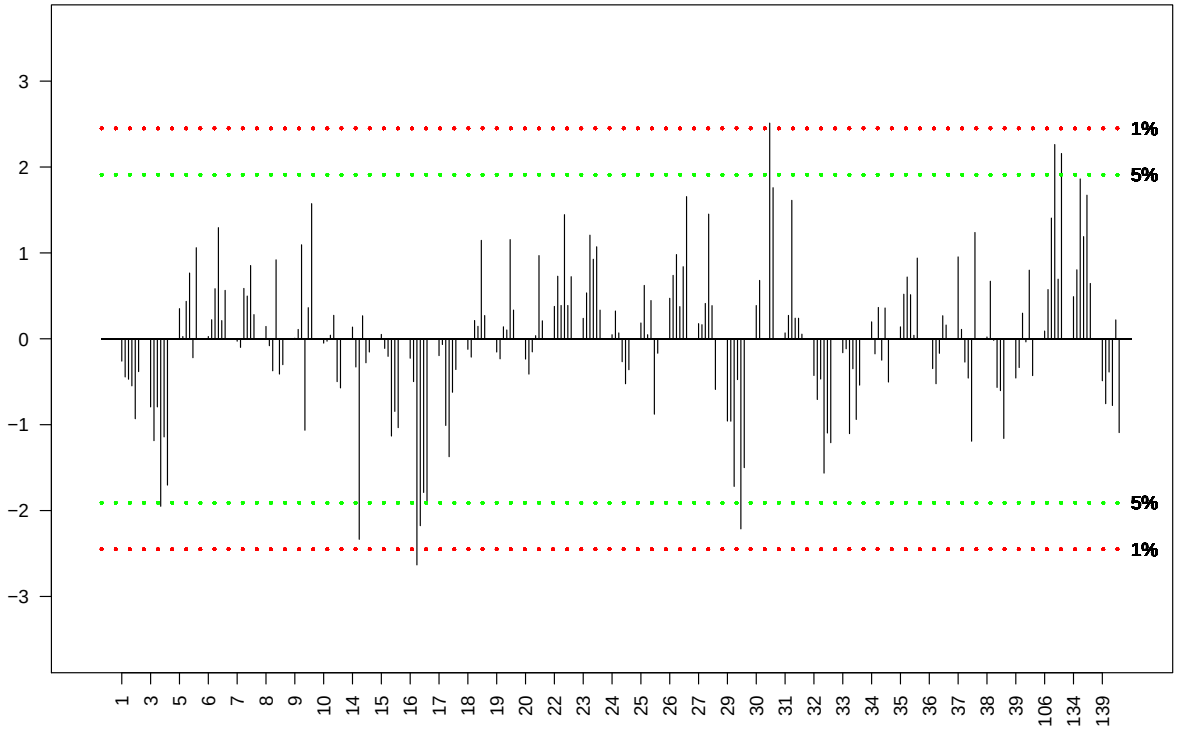
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7						
8						
9						
10						
14			bc			
15						
16			b			
17						
18						
19						
20						
22						
23						
24						
25						
26		C				
27						
29						
30						
31		C				
32						
33						
34	C					
35						
36						
37				c		c
38						
39	A					
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

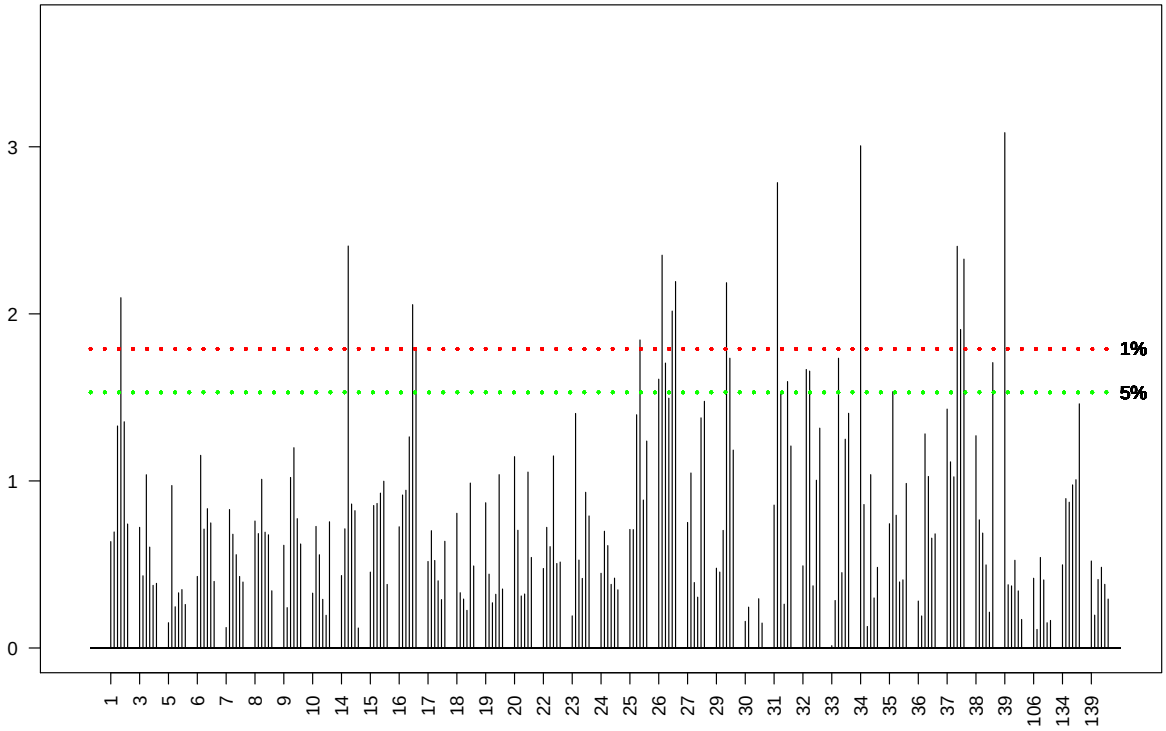
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

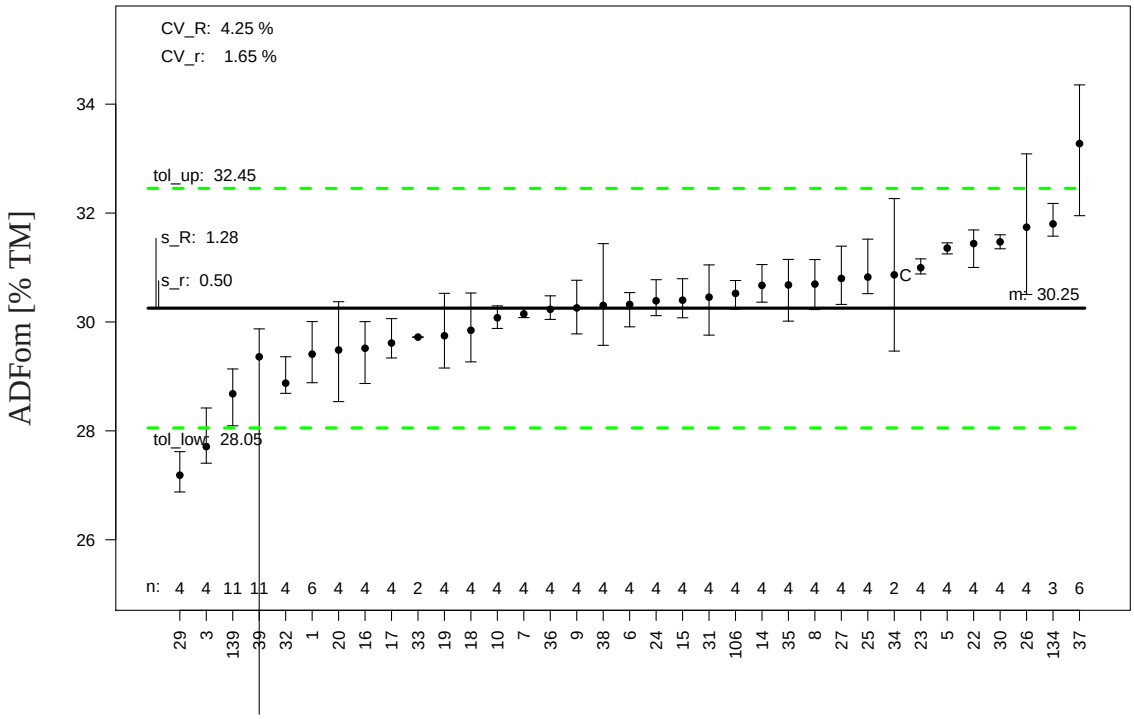
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

13.4 Einzelproben / Single Samples

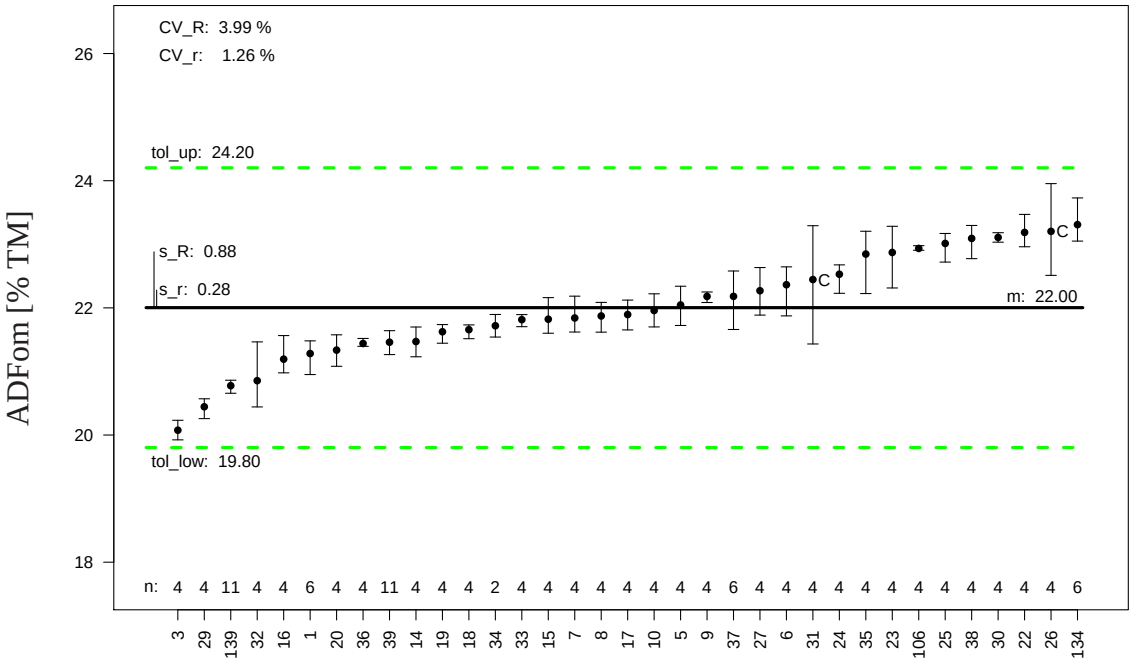
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

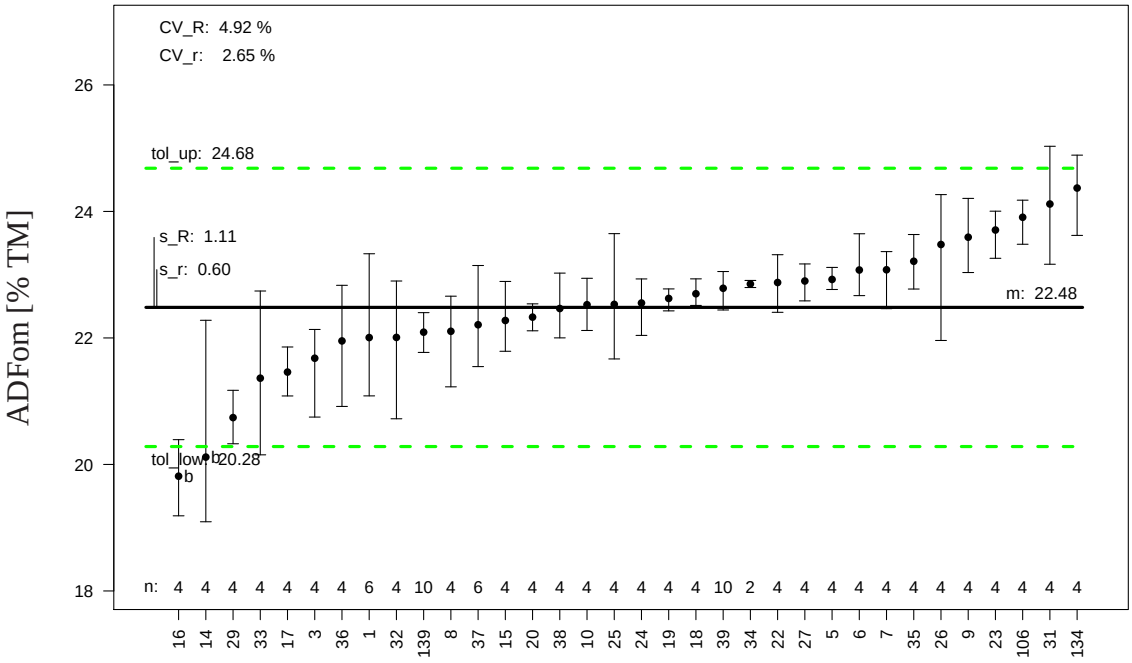
Probe/Sample 1901:



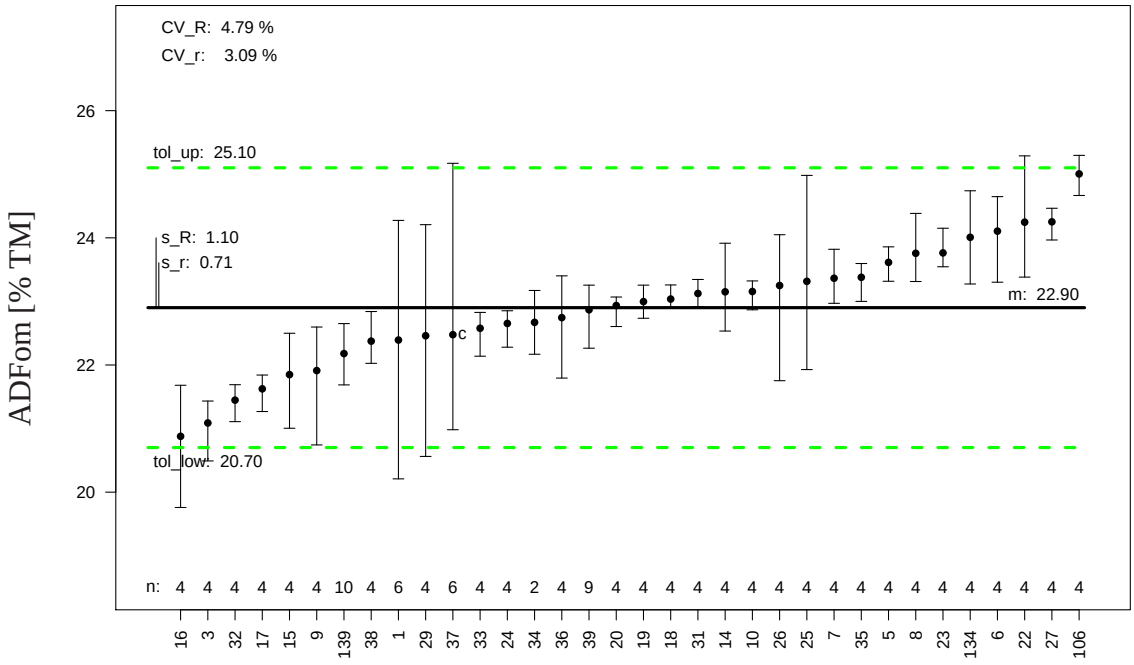
Probe/Sample 1902:



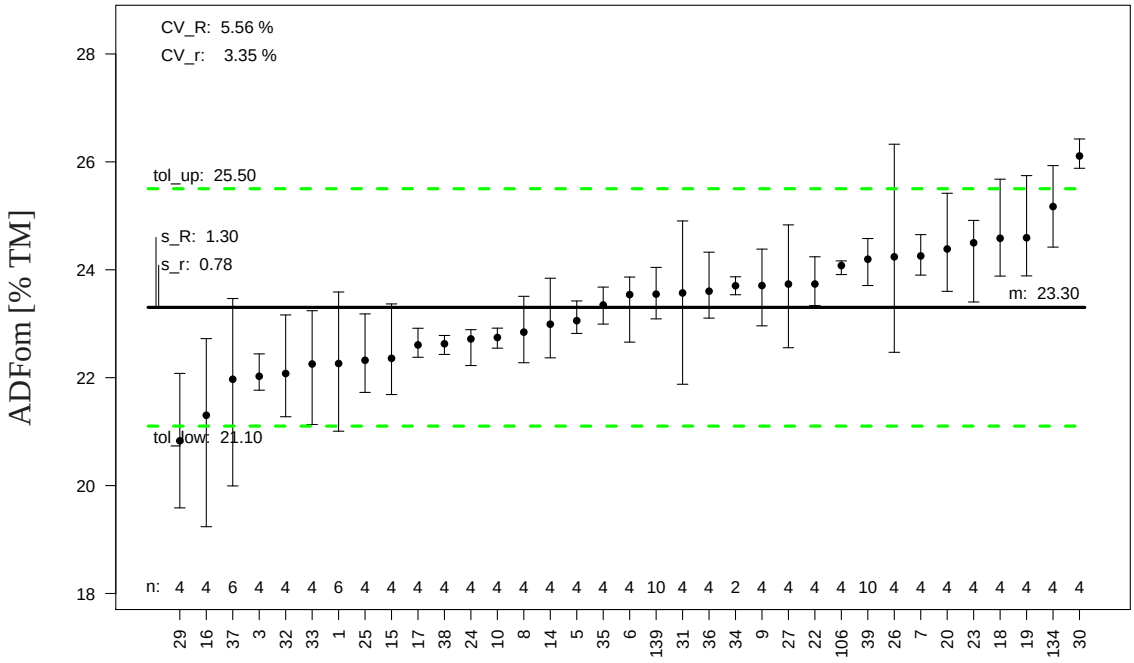
Probe/Sample 1903:



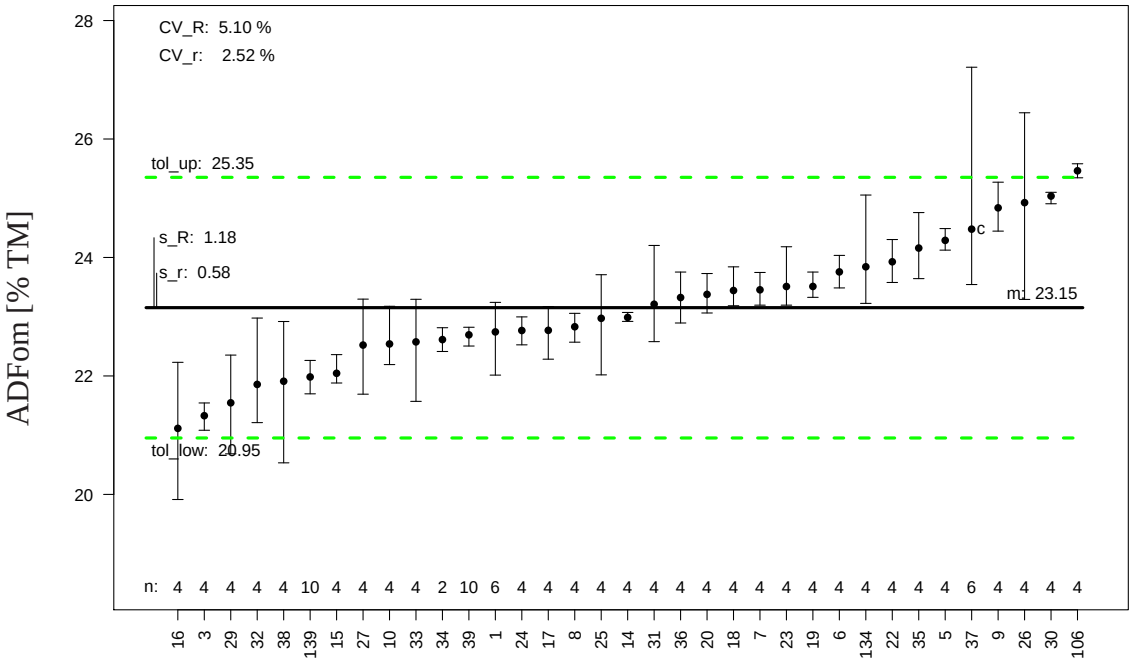
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



14 Merkmal / Constituent: ADL

Einheit / Unit: % TM

14.1 Anmerkungen / Annotations

14.2 Laborbeurteilung / Proficiency Test

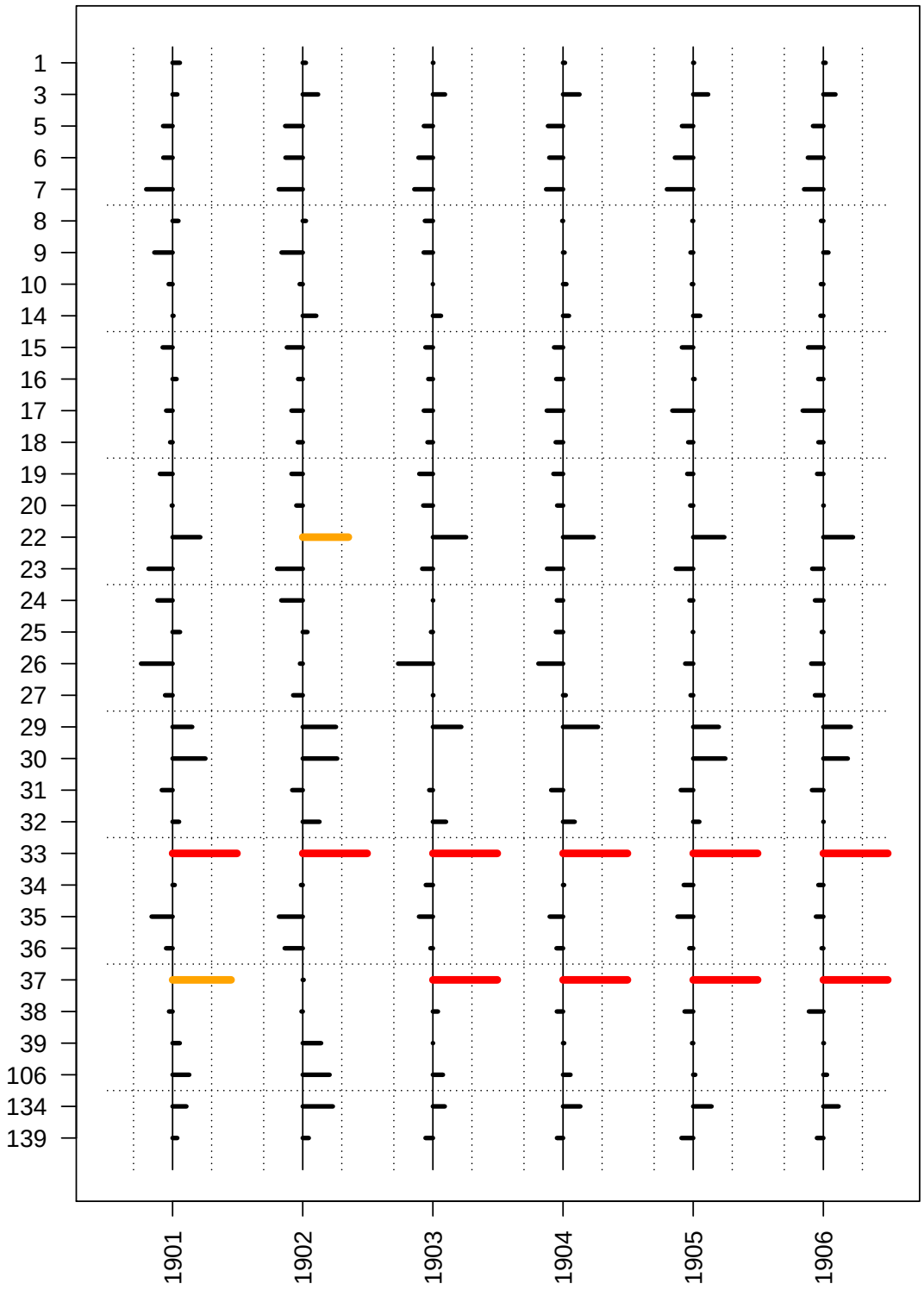
In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wird die Vergleichbarkeit, wie sie in in diesem Ringversuch bestimmt worden ist, herangezogen.

For calculation of the z scores the reproducibility as determined in this ring test was used

ADL

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample Labor/Lab	1901		1902		1903		1904		1905		1906		Differenz	
	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	2.45	0.10	1.43	0.03	1.80	0.01	1.79	0.02	1.91	0.01	1.66	0.03		
3	2.42	0.07	1.55	0.15	1.94	0.15	1.97	0.20	2.09	0.19	1.79	0.17		
5	2.21	-0.13	1.24	-0.17	1.68	-0.11	1.58	-0.19	1.76	-0.14	1.48	-0.14		
6	2.22	-0.13	1.24	-0.16	1.61	-0.18	1.59	-0.17	1.67	-0.23	1.41	-0.21		
7	1.98	-0.37	1.17	-0.23	1.56	-0.23	1.56	-0.21	1.57	-0.33	1.36	-0.27		
8	2.43	0.08	1.43	0.03	1.69	-0.10	1.75	-0.01	1.89	-0.01	1.59	-0.03		
9	2.09	-0.26	1.20	-0.20	1.68	-0.11	1.78	0.02	1.87	-0.03	1.69	0.07		
10	2.29	-0.06	1.37	-0.03	1.79	-0.00	1.81	0.04	1.89	-0.02	1.59	-0.03		
14	2.36	0.01	1.53	0.13	1.89	0.10	1.84	0.07	1.99	0.09	1.58	-0.04		
15	2.21	-0.14	1.25	-0.15	1.70	-0.09	1.65	-0.11	1.76	-0.14	1.41	-0.21		
16	2.40	0.06	1.36	-0.04	1.74	-0.06	1.68	-0.08	1.92	0.02	1.55	-0.07		
17	2.26	-0.09	1.30	-0.11	1.68	-0.11	1.56	-0.20	1.64	-0.26	1.34	-0.29		
18	2.31	-0.03	1.36	-0.05	1.73	-0.07	1.67	-0.09	1.84	-0.06	1.56	-0.07		
19	2.17	-0.18	1.30	-0.11	1.62	-0.17	1.64	-0.12	1.83	-0.07	1.54	-0.09		
20	2.34	-0.01	1.34	-0.06	1.67	-0.12	1.69	-0.07	1.87	-0.04	1.63	0.01		
22	2.74	0.39	1.84	0.44	2.21	0.42	2.14	0.38	2.29	0.39	2.03	0.41		
23	2.01	-0.34	1.16	-0.24	1.66	-0.13	1.57	-0.20	1.68	-0.22	1.47	-0.15		
24	2.13	-0.21	1.20	-0.20	1.80	0.00	1.69	-0.08	1.86	-0.05	1.51	-0.12		
25	2.45	0.11	1.45	0.04	1.77	-0.02	1.67	-0.09	1.90	-0.00	1.60	-0.02		
26	1.90	-0.45	1.38	-0.03	1.36	-0.43	1.46	-0.30	1.80	-0.10	1.46	-0.17		
27	2.24	-0.11	1.31	-0.09	1.80	0.01	1.80	0.03	1.87	-0.03	1.51	-0.12		
29	2.63	0.28	1.72	0.32	2.15	0.35	2.20	0.43	2.23	0.32	2.00	0.38		
30	2.81	0.46	1.73	0.33					2.31	0.40	1.96	0.34		
31	2.20	-0.15	1.30	-0.10	1.75	-0.05	1.62	-0.15	1.75	-0.16	1.47	-0.16		
32	2.44	0.09	1.56	0.16	1.96	0.16	1.91	0.14	1.98	0.08	1.63	0.00		
33	4.10	1.75	3.18	1.78	3.36	1.56	3.40	1.63	3.45	1.55	3.19	1.56		
34	2.38	0.03	1.39	-0.02	1.71	-0.09	1.78	0.01	1.78	-0.12	1.56	-0.07		
35	2.05	-0.30	1.18	-0.23	1.62	-0.17	1.60	-0.17	1.71	-0.20	1.52	-0.10		
36	2.26	-0.09	1.23	-0.17	1.76	-0.03	1.68	-0.08	1.85	-0.05	1.60	-0.02		
37	3.18	0.83	1.41	0.01	2.64	0.85	2.55	0.79	2.68	0.78	2.62	0.99		
38	2.30	-0.05	1.39	-0.01	1.86	0.06	1.69	-0.08	1.80	-0.11	1.42	-0.20		
39	2.45	0.10	1.58	0.18	1.79	0.00	1.78	0.01	1.89	-0.01	1.63	0.01		
106	2.58	0.24	1.66	0.26	1.92	0.13	1.86	0.09	1.93	0.03	1.68	0.05		
134	2.54	0.19	1.69	0.29	1.94	0.15	1.98	0.21	2.13	0.23	1.84	0.21		
139	2.41	0.07	1.46	0.06	1.70	-0.09	1.69	-0.07	1.76	-0.15	1.54	-0.09		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

14.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906
n	154	158	150	149	154	154
p	35	35	34	34	35	35
n_1	152	154	146	145	150	150
p_1	34	34	33	33	34	34
m	2.35	1.40	1.79	1.76	1.90	1.62
s_r	0.11	0.07	0.08	0.10	0.10	0.08
CV_r	4.72	4.91	4.36	5.41	5.15	5.17
r	0.31	0.19	0.22	0.27	0.28	0.24
s_R	0.28	0.19	0.24	0.24	0.25	0.27
CV_R	11.76	13.27	13.61	13.68	12.89	16.62
R	0.78	0.53	0.69	0.68	0.69	0.76
HORRAT[1]	3.34	3.49	3.71	3.72	3.55	4.47

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

ADL

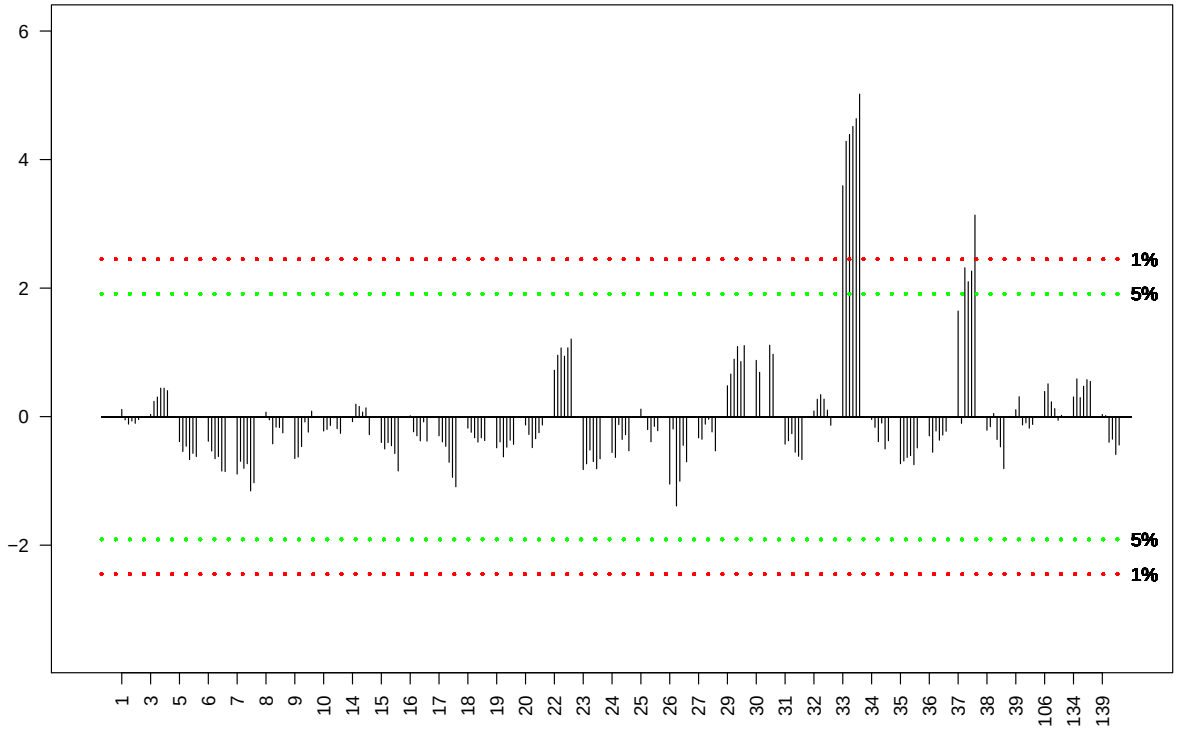
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7			c			
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26	C	C				C
27						
29						
30						
31		C				
32						
33	B	B	B	B	B	B
34				c	C	C
35						
36						
37	B		B	B	B	B
38						
39	C					
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

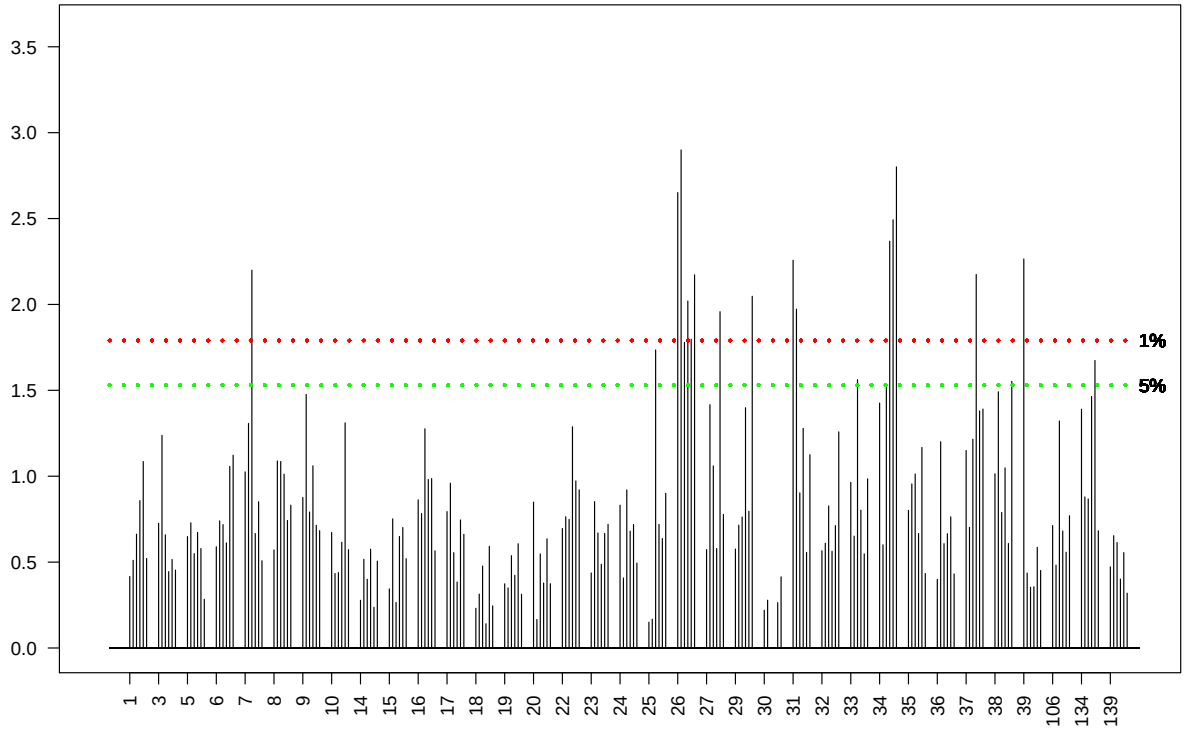
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

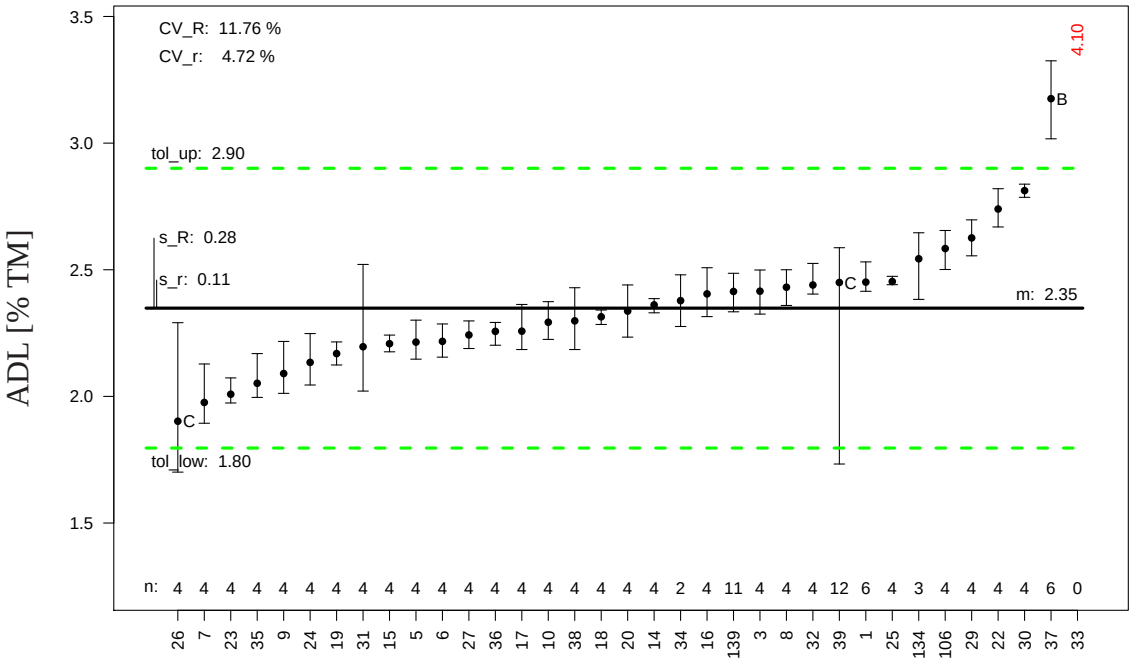
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

14.4 Einzelproben / Single Samples

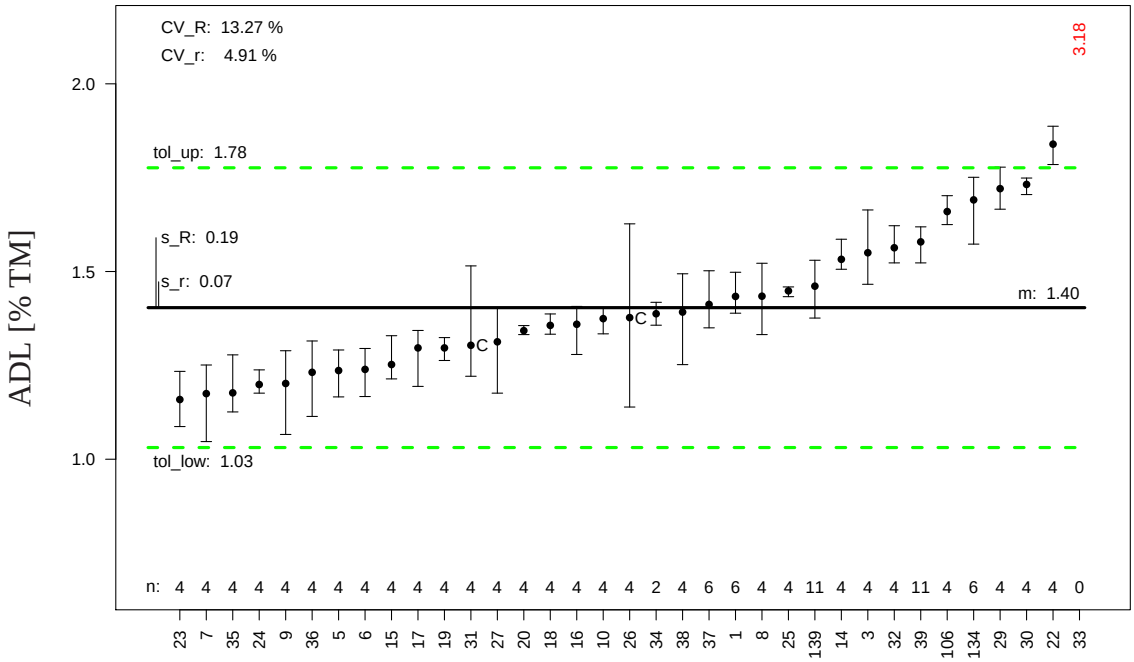
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

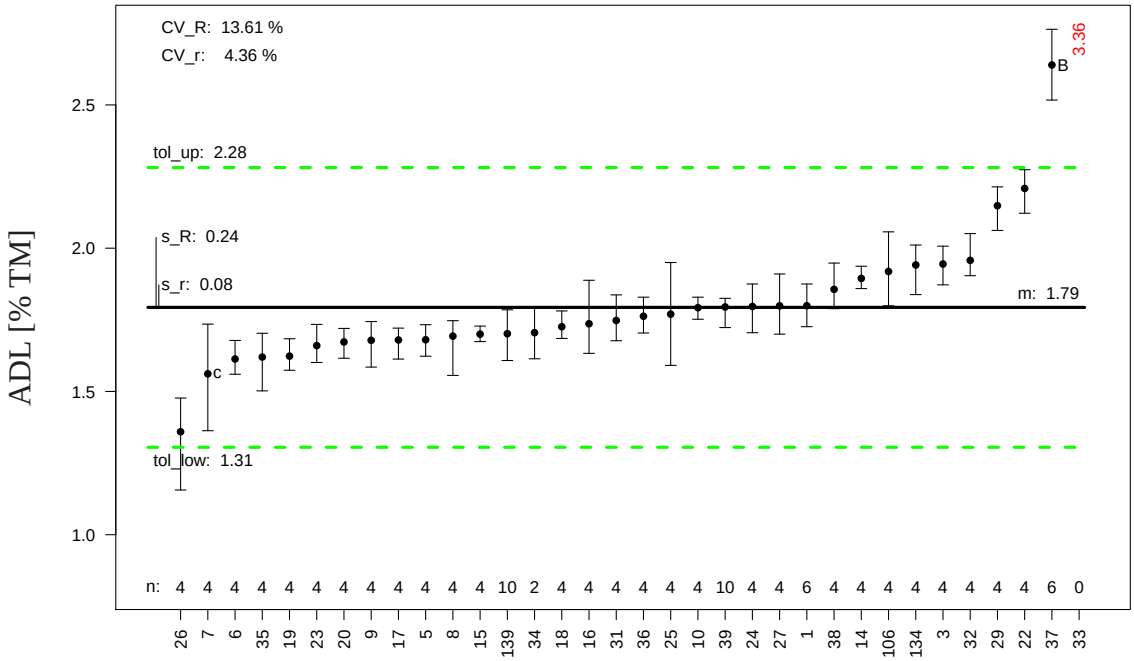
Probe/Sample 1901:



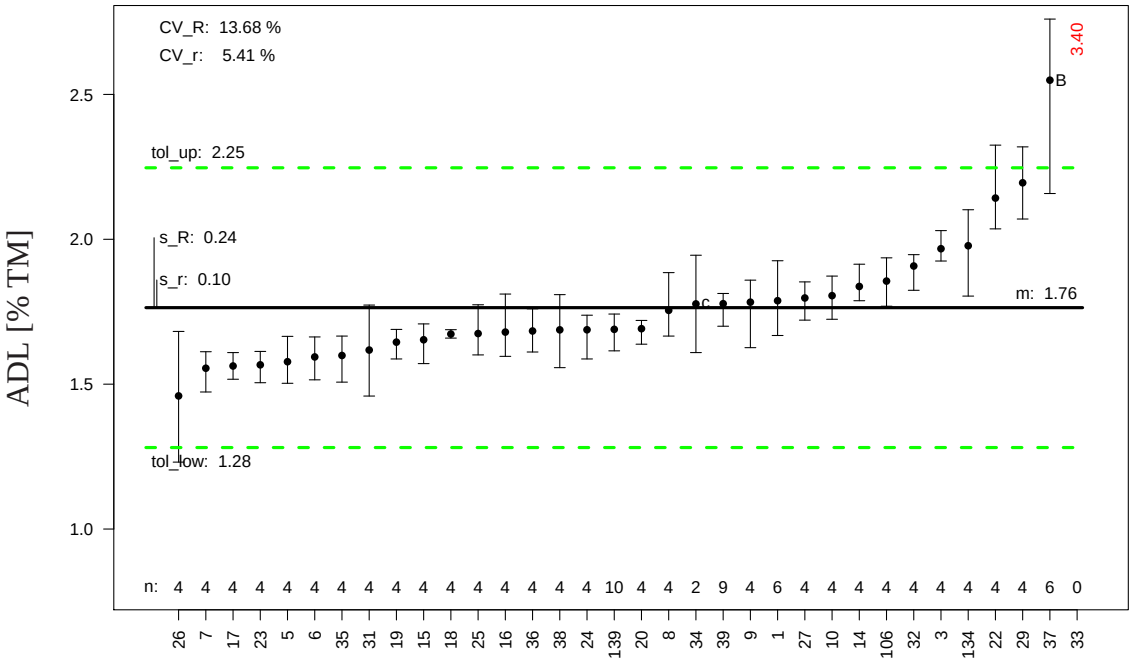
Probe/Sample 1902:



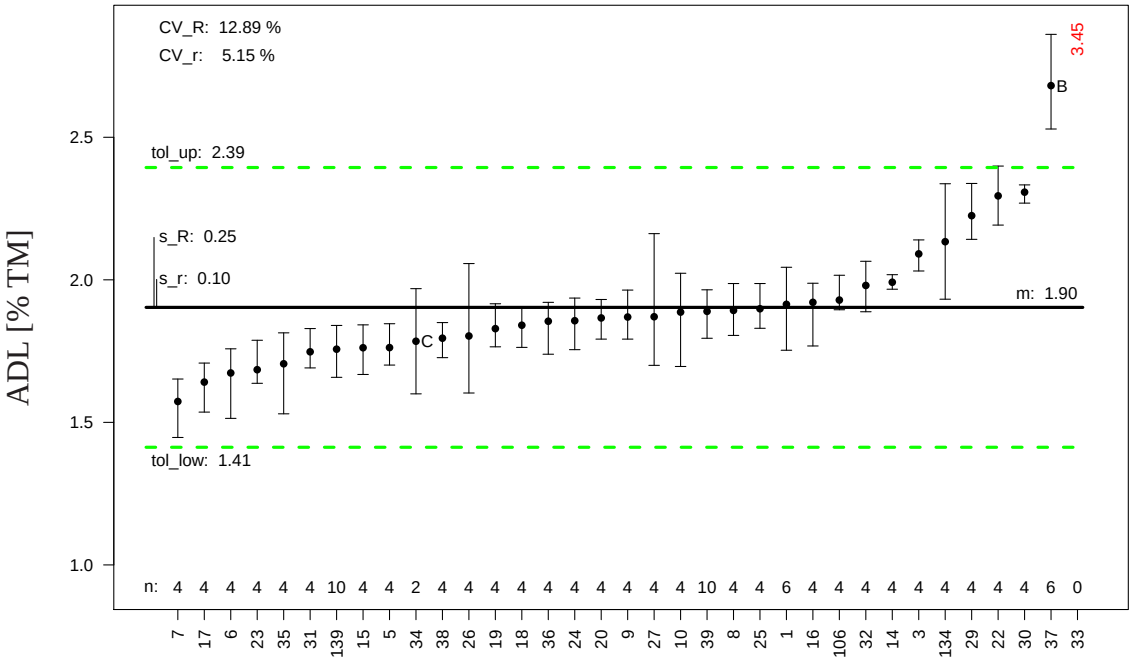
Probe/Sample 1903:



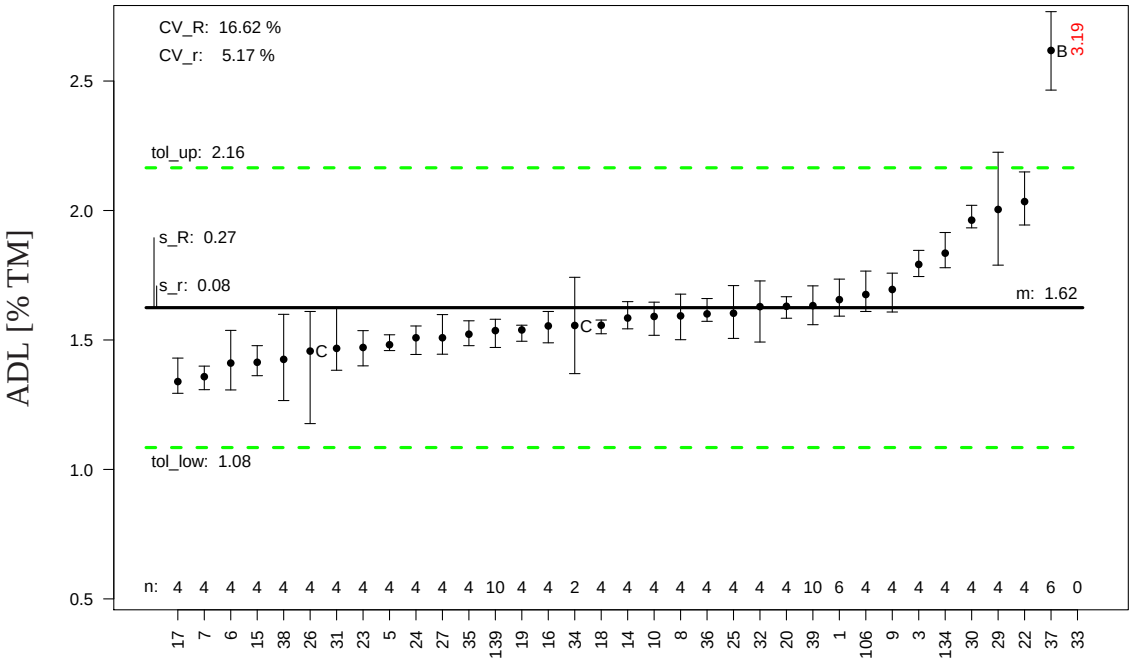
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



15 Merkmal / Constituent: NDF

Einheit / Unit: % TM

15.1 Anmerkungen / Annotations

15.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

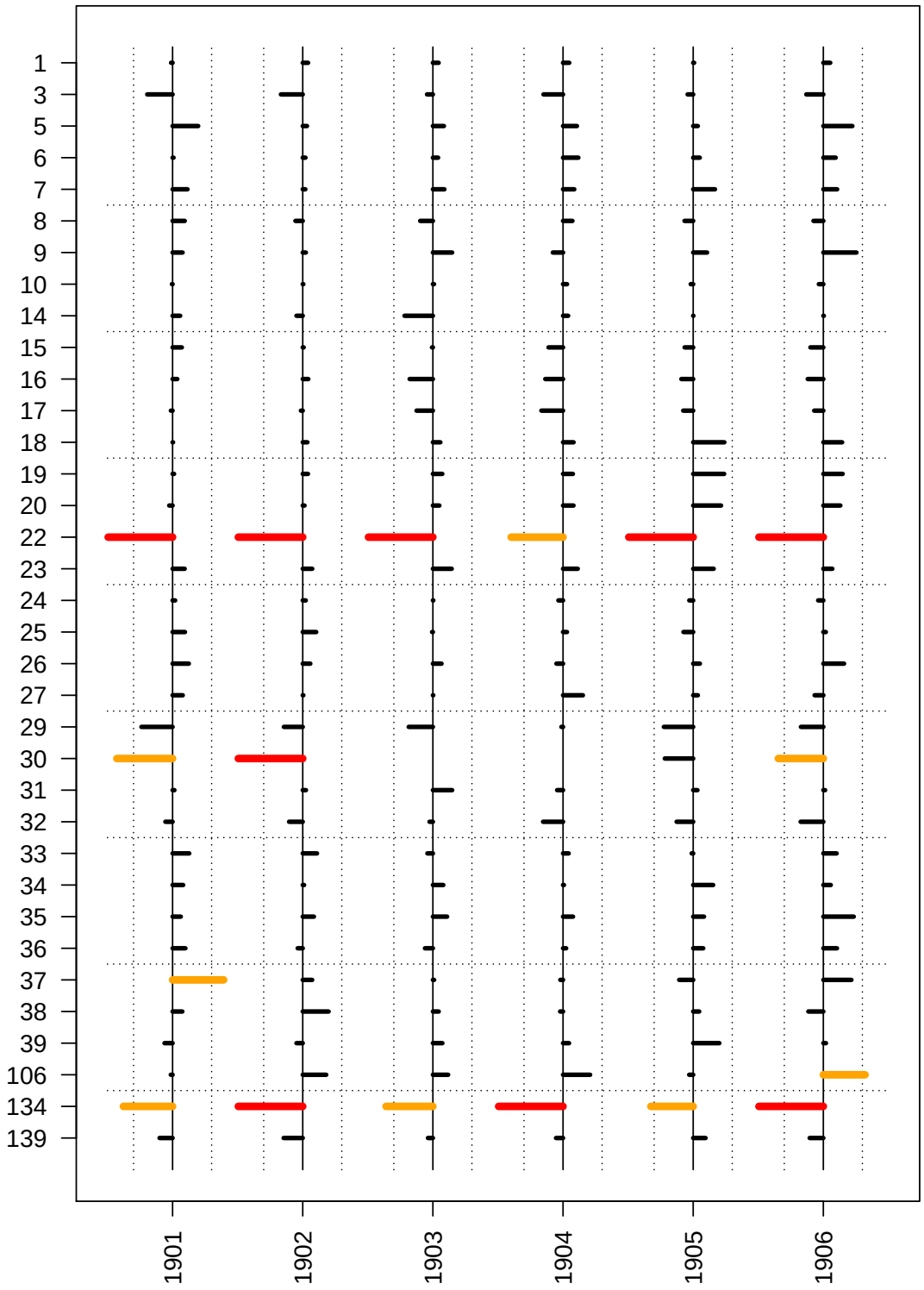
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.75 % TM

Quelle / Source: VDLUFA ASR

NDF

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

NDF

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	54.68	-0.13	42.08	0.48	43.81	0.51	45.55	0.55	43.85	0.08	43.36	0.62		
3	52.54	-2.27	39.65	-1.96	42.77	-0.52	43.24	-1.75	43.27	-0.50	41.21	-1.53		
5	57.11	2.30	41.98	0.38	44.28	0.99	46.24	1.24	44.18	0.41	45.35	2.60		
6	54.90	0.08	41.85	0.24	43.76	0.47	46.37	1.37	44.36	0.59	43.85	1.11		
7	56.15	1.34	41.84	0.23	44.32	1.03	46.00	1.01	45.72	1.95	43.98	1.24		
8	55.90	1.09	40.95	-0.66	42.16	-1.14	45.84	0.84	42.99	-0.78	41.86	-0.88		
9	55.71	0.89	41.88	0.28	45.02	1.73	44.08	-0.92	45.01	1.24	45.71	2.97		
10	54.76	-0.06	41.65	0.05	43.39	0.10	45.35	0.36	43.55	-0.22	42.34	-0.41		
14	55.49	0.68	41.04	-0.56	40.75	-2.55	45.45	0.46	43.79	0.02	42.79	0.04		
15	55.64	0.83	41.69	0.09	43.21	-0.08	43.70	-1.30	43.00	-0.77	41.58	-1.16		
16	55.24	0.42	42.10	0.50	41.21	-2.09	43.41	-1.59	42.71	-1.06	41.34	-1.40		
17	54.66	-0.15	41.44	-0.16	41.83	-1.47	43.06	-1.94	42.87	-0.90	41.92	-0.82		
18	54.85	0.04	42.02	0.42	43.96	0.67	45.94	0.94	46.56	2.79	44.43	1.69		
19	54.95	0.13	42.07	0.47	44.14	0.84	45.88	0.88	46.54	2.77	44.47	1.73		
20	54.51	-0.30	41.76	0.16	43.87	0.58	45.93	0.94	46.27	2.50	44.27	1.52		
22	49.31	-5.50	36.15	-5.45	36.99	-6.31	40.34	-4.65	38.19	-5.58	37.29	-5.45		
23	55.90	1.08	42.45	0.85	44.98	1.69	46.31	1.32	45.60	1.83	43.55	0.81		
24	55.04	0.23	41.87	0.27	43.33	0.04	44.58	-0.42	43.42	-0.35	42.28	-0.46		
25	55.92	1.11	42.81	1.21	43.22	-0.07	45.35	0.35	42.90	-0.87	42.97	0.22		
26	56.27	1.45	42.28	0.68	44.07	0.77	44.40	-0.59	44.37	0.60	44.60	1.85		
27	55.72	0.91	41.66	0.05	43.33	0.03	46.77	1.78	44.19	0.42	41.96	-0.78		
29	52.02	-2.79	39.91	-1.69	41.13	-2.17	44.85	-0.15	41.14	-2.63	40.73	-2.01		
30	49.81	-5.00	35.75	-5.85					41.22	-2.55	38.71	-4.04		
31	54.97	0.16	41.89	0.29	45.02	1.73	44.47	-0.53	44.15	0.38	42.90	0.16		
32	54.16	-0.65	40.38	-1.23	42.99	-0.30	43.21	-1.79	42.28	-1.49	40.70	-2.04		
33	56.31	1.49	42.88	1.28	42.80	-0.49	45.50	0.51	43.64	-0.13	43.93	1.19		
34	55.76	0.95	41.72	0.12	44.23	0.93	45.08	0.08	45.56	1.79	43.41	0.66		
35	55.55	0.73	42.60	1.00	44.57	1.27	45.89	0.89	44.74	0.97	45.47	2.73		
36	55.96	1.15	41.15	-0.46	42.58	-0.71	45.27	0.28	44.67	0.90	43.96	1.22		
37	59.39	4.58	42.45	0.84	43.40	0.11	44.75	-0.24	42.51	-1.25	45.26	2.52		
38	55.69	0.87	43.92	2.32	43.81	0.52	44.73	-0.26	44.31	0.54	41.40	-1.34		
39	54.09	-0.72	41.04	-0.56	44.14	0.85	45.53	0.54	46.11	2.34	42.98	0.23		
106	54.65	-0.16	43.70	2.10	44.66	1.37	47.42	2.43	43.41	-0.36	46.48	3.74		
134	50.40	-4.41	36.28	-5.33	39.09	-4.20	39.38	-5.62	39.97	-3.79	37.45	-5.30		
139	53.64	-1.17	39.89	-1.71	42.85	-0.44	44.37	-0.63	44.88	1.11	41.52	-1.22		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

15.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	153	150	146	145	154	154	
p_1	35	33	33	33	35	35	
m	54.81	41.60	43.29	45.00	43.77	42.74	
s_r	0.73	0.45	0.85	1.02	1.08	0.96	
CV_r	1.34	1.08	1.96	2.27	2.46	2.24	
r	2.07	1.27	2.40	2.89	3.05	2.71	
s_R	2.04	1.52	1.48	1.59	2.03	2.24	1.75
CV_R	3.72	3.66	3.42	3.52	4.64	5.25	
R	5.77	4.31	4.19	4.49	5.74	6.35	4.95
HORRAT[1]	1.70	1.60	1.51	1.56	2.05	2.31	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

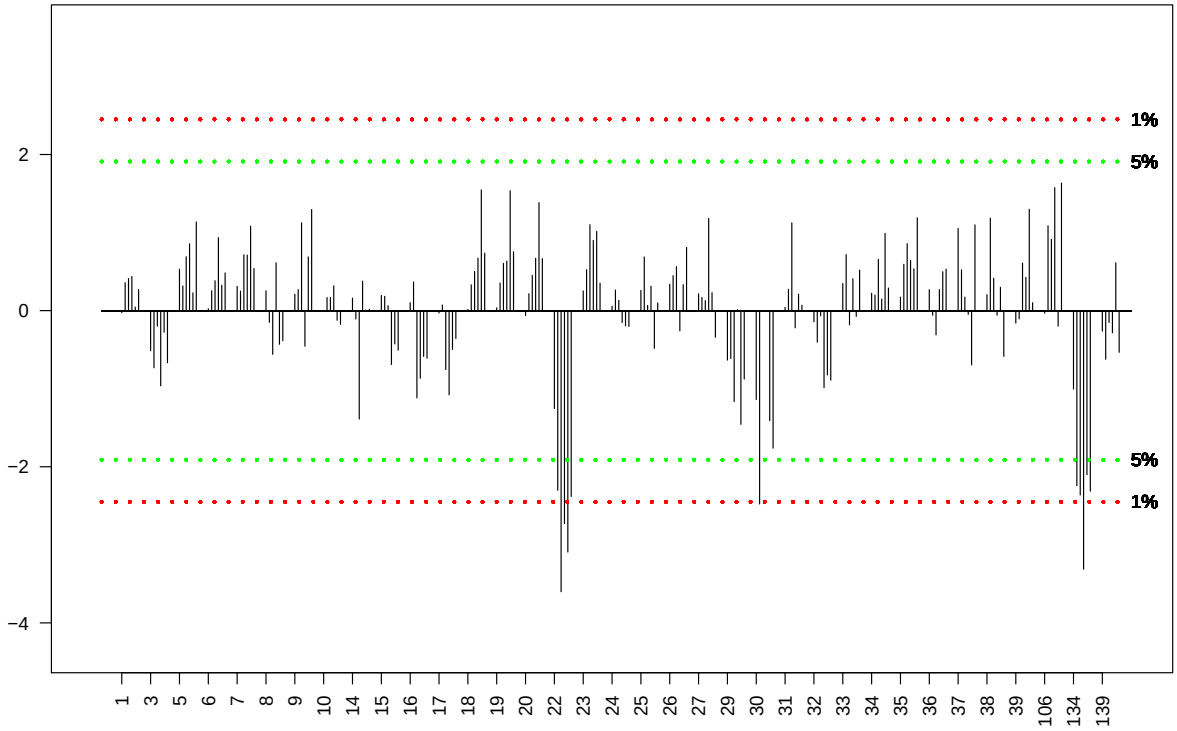
In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3						
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22	b	B	B	B	b	
23						
24						
25						
26	C	C	c		c	C
27						
29						
30	b	B				
31						
32						
33						
34						
35						
36						
37				c		
38						c
39	A					
106		c				
134		B	b	B		
139						

NDF

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

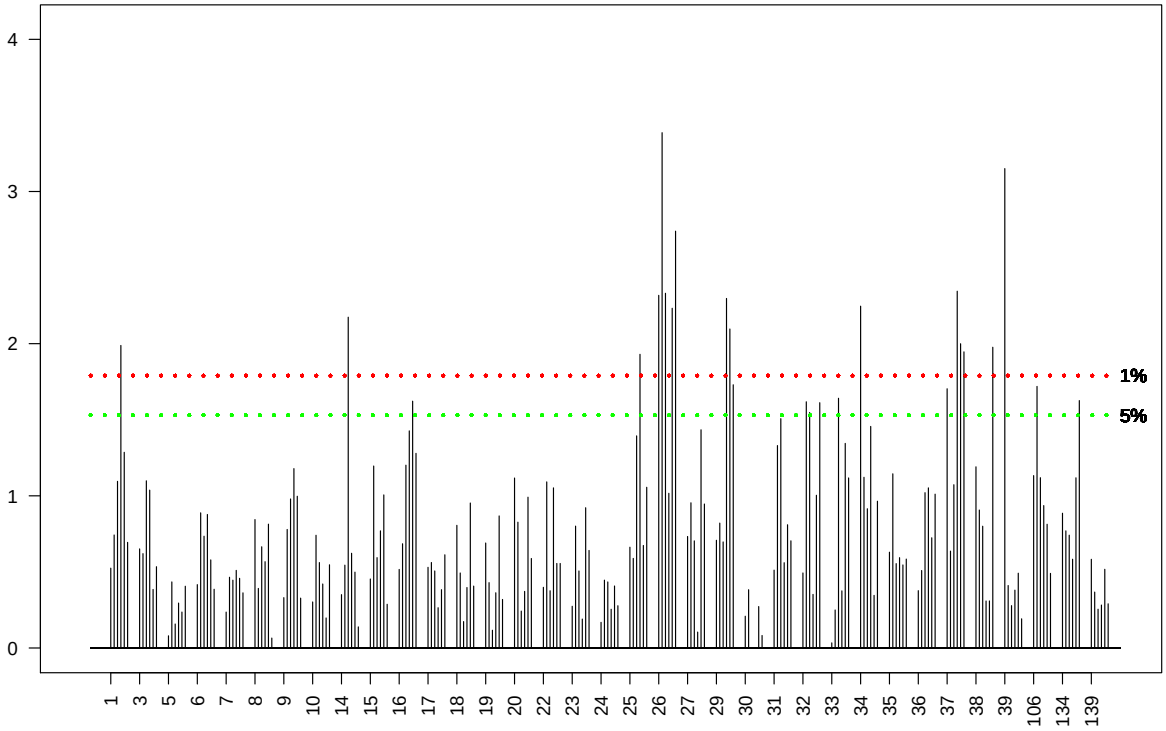
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

NDF

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

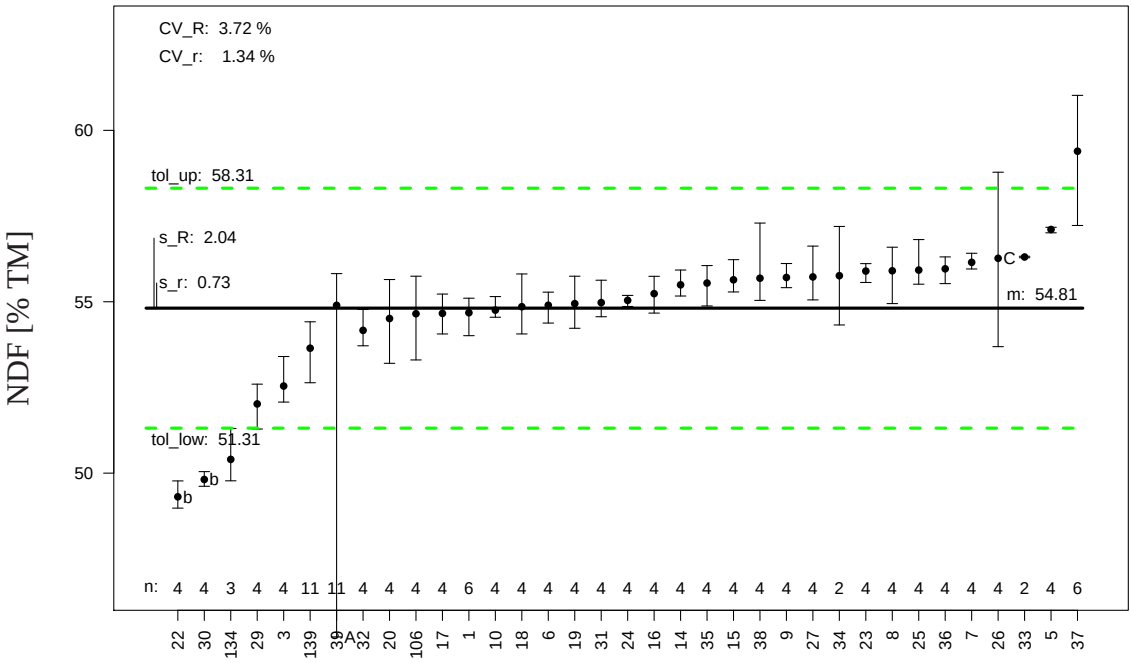
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

15.4 Einzelproben / Single Samples

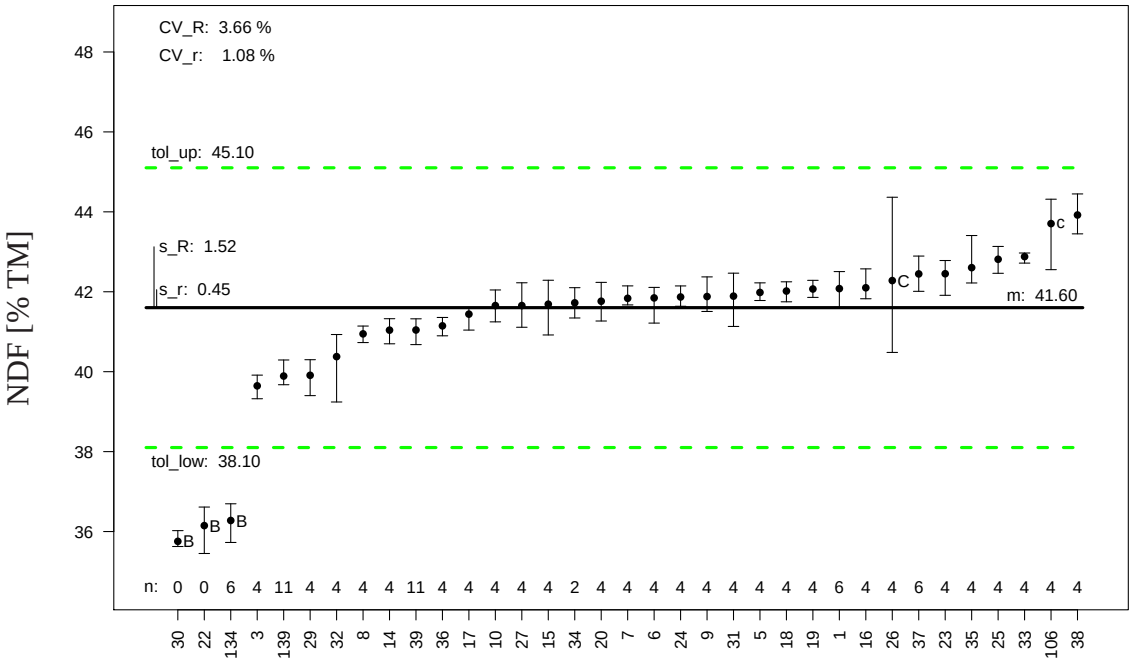
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

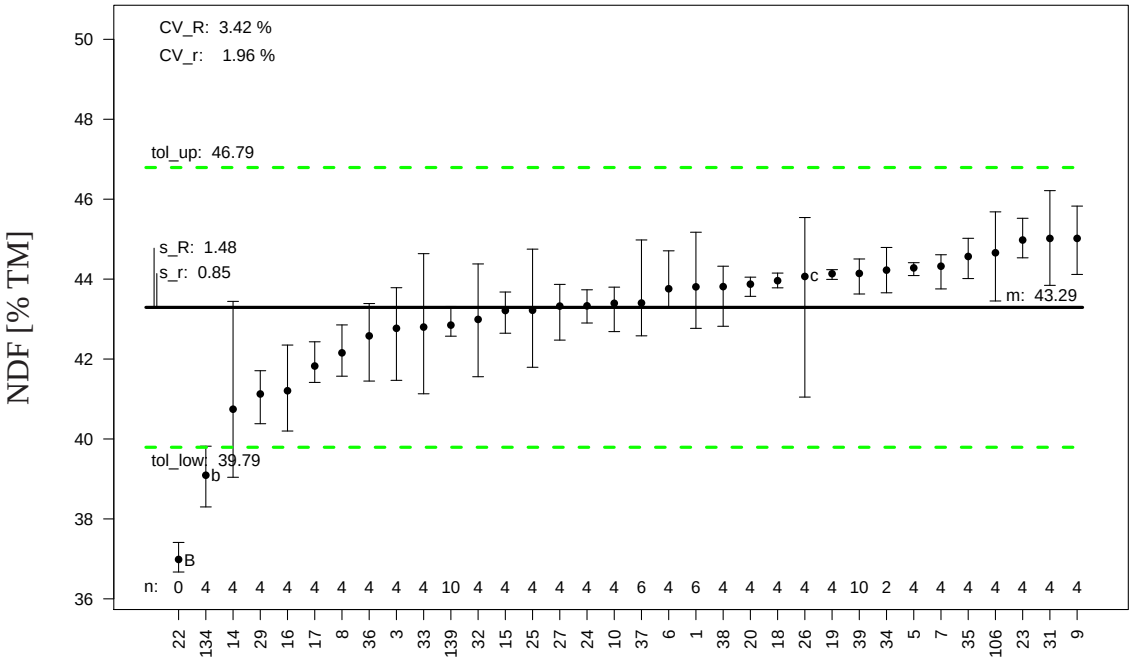
Probe/Sample 1901:



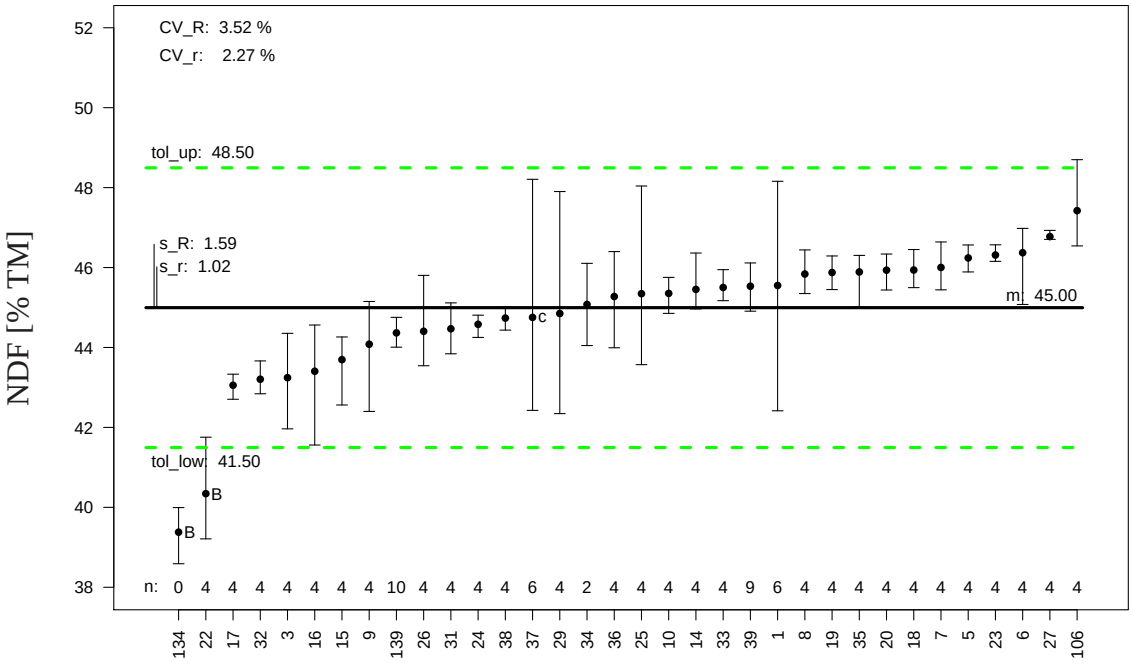
Probe/Sample 1902:



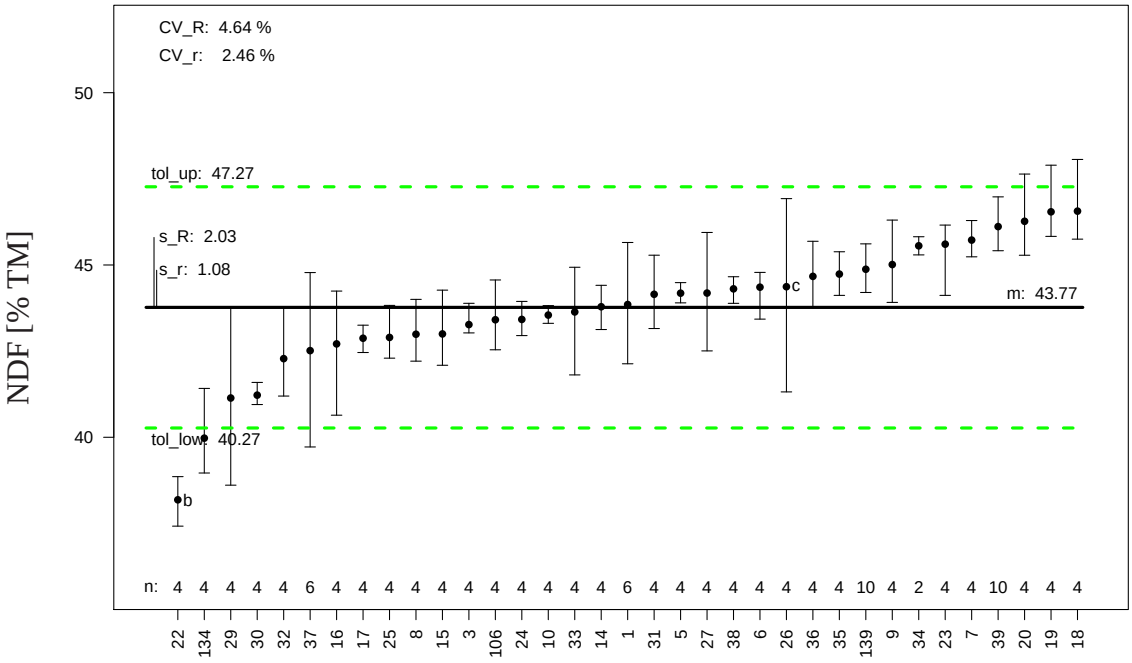
Probe/Sample 1903:



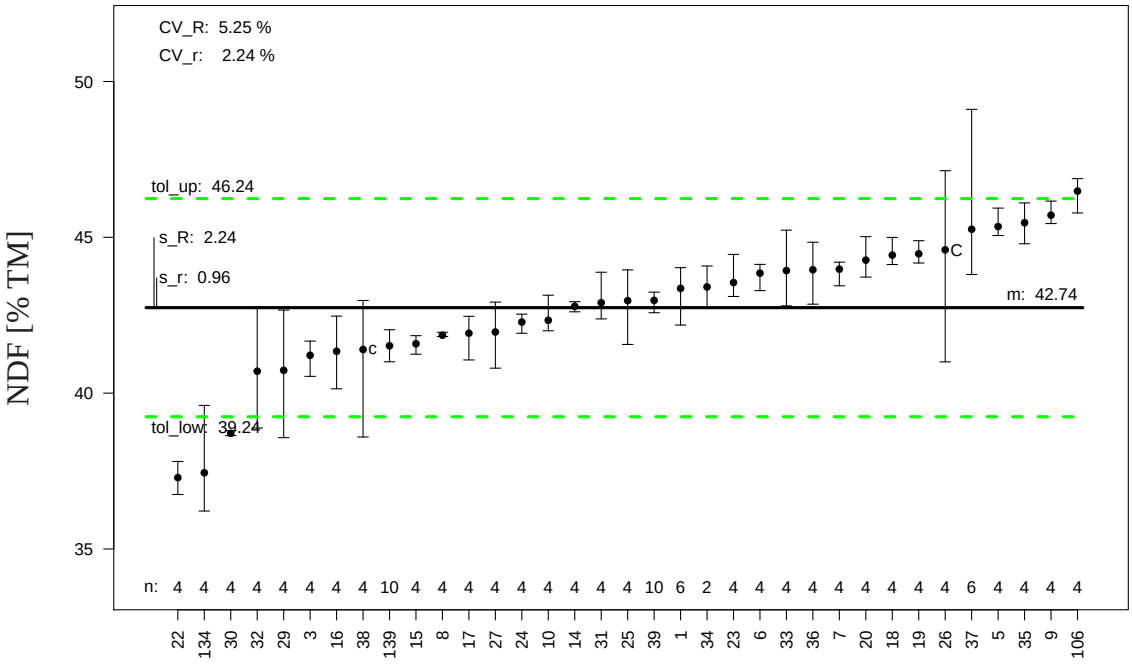
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



16 Merkmal / Constituent: ADFom

Einheit / Unit: % TM

16.1 Anmerkungen / Annotations

16.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

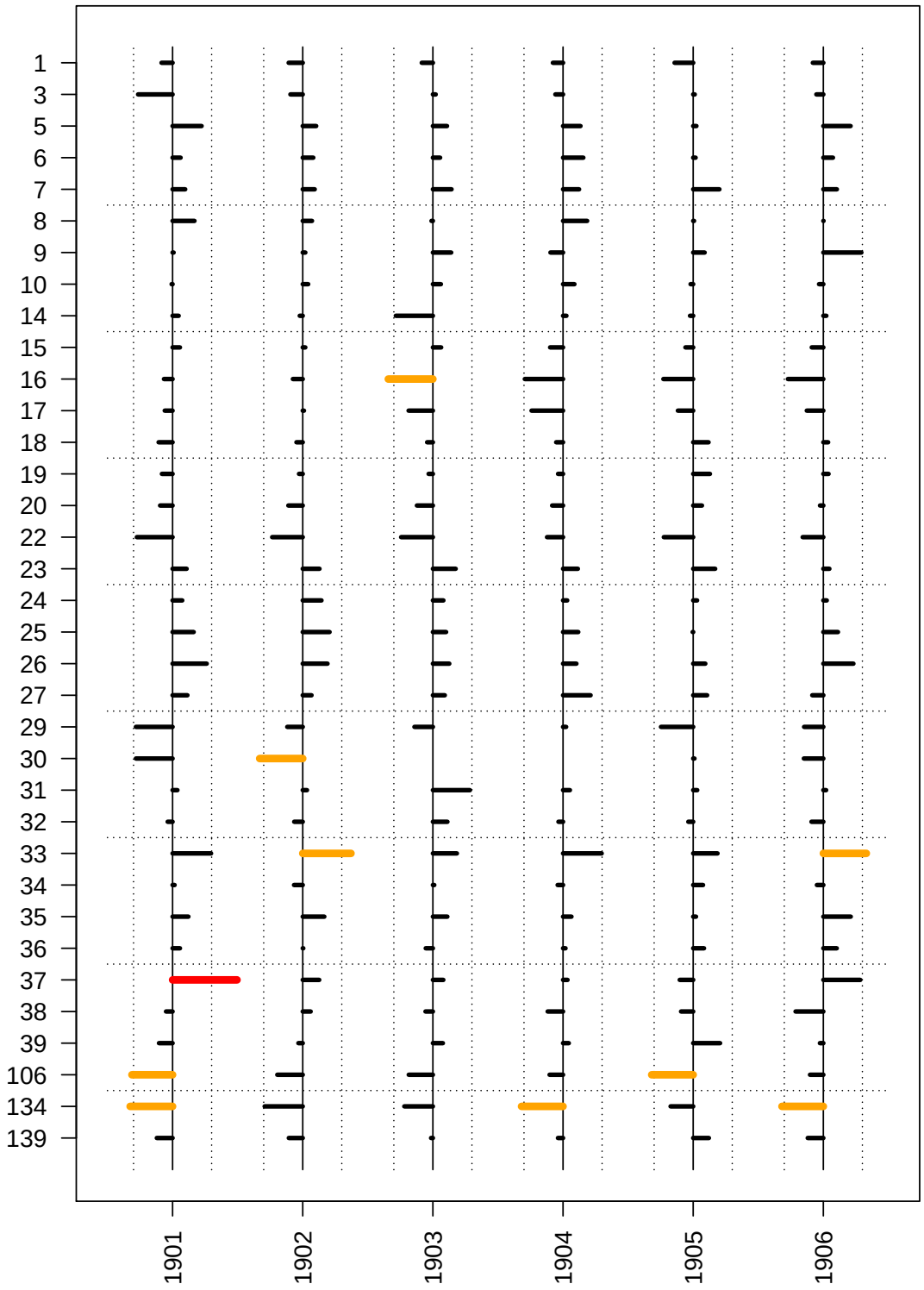
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.1 % TM

Quelle / Source: VDLUFA ASR

ADFom

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	31.72	-0.62	21.79	-0.79	23.56	-0.63	23.91	-0.57	23.91	-1.05	22.98	-0.59		
3	30.40	-1.94	21.89	-0.69	24.34	0.16	24.05	-0.43	25.05	0.09	23.18	-0.39		
5	33.97	1.63	23.34	0.76	24.98	0.80	25.47	0.98	25.14	0.18	25.11	1.53		
6	32.79	0.45	23.18	0.59	24.59	0.41	25.63	1.14	25.09	0.13	24.12	0.54		
7	33.05	0.71	23.26	0.68	25.24	1.05	25.39	0.90	26.44	1.48	24.34	0.76		
8	33.57	1.23	23.10	0.52	24.11	-0.08	25.84	1.36	25.01	0.05	23.59	0.01		
9	32.40	0.06	22.73	0.15	25.22	1.03	23.78	-0.71	25.60	0.64	25.72	2.14		
10	32.29	-0.05	22.89	0.31	24.64	0.45	25.13	0.64	24.81	-0.15	23.33	-0.24		
14	32.68	0.34	22.41	-0.17	22.10	-2.09	24.68	0.19	24.78	-0.18	23.75	0.17		
15	32.75	0.41	22.73	0.14	24.65	0.46	23.76	-0.73	24.52	-0.44	22.92	-0.65		
16	31.86	-0.49	22.03	-0.55	21.67	-2.51	22.33	-2.15	23.28	-1.68	21.58	-2.00		
17	31.90	-0.44	22.65	0.07	22.82	-1.37	22.71	-1.78	24.10	-0.86	22.64	-0.93		
18	31.55	-0.79	22.23	-0.35	23.86	-0.32	24.10	-0.39	25.82	0.86	23.85	0.27		
19	31.74	-0.60	22.37	-0.21	23.94	-0.24	24.21	-0.28	25.90	0.94	23.87	0.29		
20	31.64	-0.70	21.77	-0.81	23.28	-0.90	23.87	-0.61	25.45	0.49	23.39	-0.19		
22	30.33	-2.01	20.86	-1.72	22.40	-1.79	23.58	-0.90	23.30	-1.65	22.41	-1.16		
23	33.13	0.79	23.53	0.94	25.47	1.28	25.32	0.83	26.20	1.24	23.92	0.34		
24	32.88	0.54	23.64	1.06	24.78	0.59	24.72	0.23	25.18	0.22	23.77	0.19		
25	33.53	1.19	24.09	1.51	24.93	0.74	25.34	0.86	24.93	-0.03	24.40	0.82		
26	34.26	1.92	23.98	1.39	25.11	0.92	25.24	0.75	25.64	0.68	25.27	1.69		
27	33.17	0.83	23.08	0.49	24.86	0.67	26.04	1.55	25.74	0.78	22.95	-0.62		
29	30.27	-2.07	21.71	-0.87	23.15	-1.04	24.66	0.17	23.15	-1.81	22.49	-1.08		
30	30.27	-2.07	20.16	-2.43					25.03	0.07	22.48	-1.10		
31	32.61	0.27	22.82	0.24	26.27	2.08	24.87	0.39	25.19	0.23	23.73	0.16		
32	32.06	-0.28	22.10	-0.48	25.00	0.82	24.23	-0.26	24.69	-0.27	22.91	-0.67		
33	34.51	2.17	25.30	2.72	25.54	1.35	26.66	2.18	26.33	1.37	26.00	2.42		
34	32.45	0.11	22.09	-0.49	24.26	0.08	24.18	-0.30	25.51	0.55	23.21	-0.36		
35	33.23	0.89	23.80	1.21	25.00	0.81	24.96	0.47	25.12	0.16	25.12	1.54		
36	32.75	0.41	22.61	0.03	23.78	-0.40	24.63	0.14	25.57	0.61	24.33	0.75		
37	36.51	4.16	23.51	0.93	24.77	0.59	24.74	0.25	24.20	-0.76	25.66	2.08		
38	31.97	-0.37	23.03	0.45	23.77	-0.42	23.62	-0.87	24.28	-0.68	22.01	-1.57		
39	31.57	-0.77	22.34	-0.24	24.75	0.56	24.81	0.32	26.47	1.52	23.38	-0.19		
106	30.05	-2.29	21.15	-1.43	22.82	-1.36	23.73	-0.76	22.62	-2.34	22.83	-0.75		
134	29.95	-2.39	20.44	-2.15	22.57	-1.61	22.15	-2.34	23.68	-1.27	21.24	-2.33		
139	31.45	-0.89	21.80	-0.79	24.08	-0.10	24.20	-0.29	25.84	0.88	22.70	-0.88		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

16.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	153	158	150	149	154	154	
p_1	35	35	34	34	35	35	
m	32.34	22.58	24.18	24.49	24.96	23.58	
s_r	0.50	0.29	0.58	0.70	0.82	0.64	
CV_r	1.55	1.30	2.41	2.88	3.27	2.69	
r	1.42	0.83	1.65	1.99	2.31	1.80	
s_R	1.46	1.08	1.16	1.14	1.23	1.27	1.10
CV_R	4.53	4.78	4.79	4.67	4.94	5.37	
R	4.14	3.06	3.28	3.24	3.49	3.58	3.11
HORRAT[1]	1.91	1.91	1.93	1.89	2.00	2.16	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

ADFom

Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

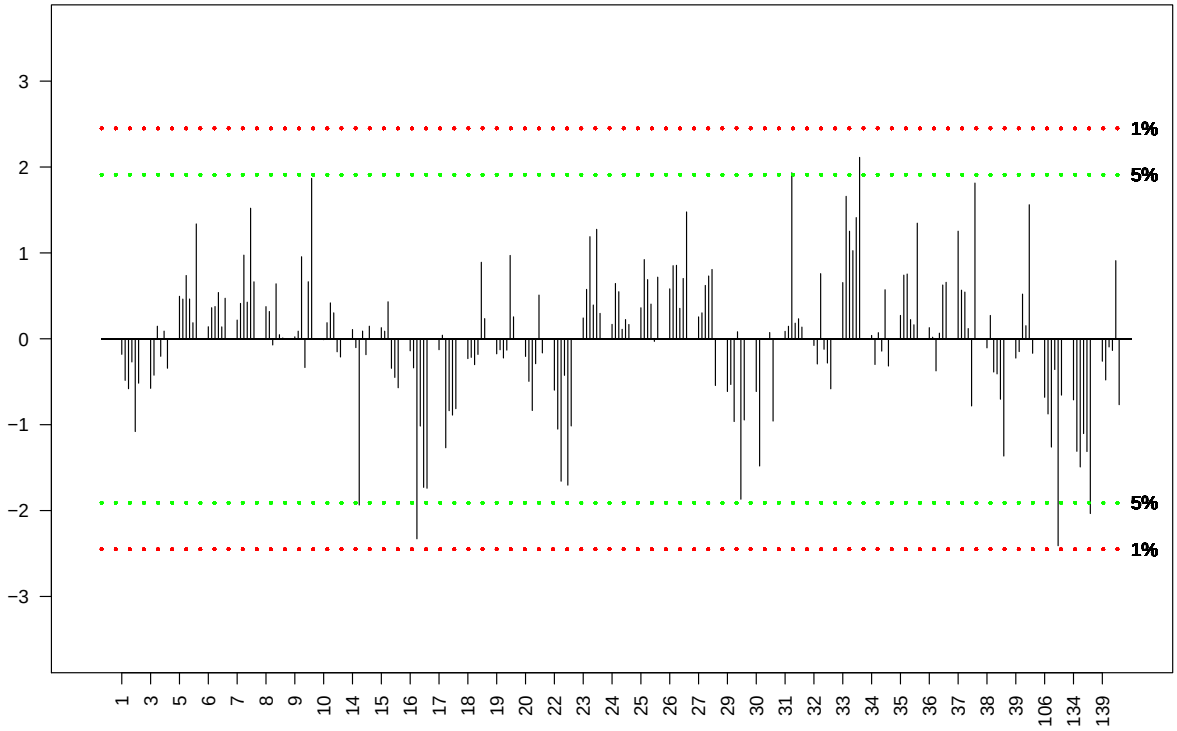
In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1				C		
3						
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26						
27						
29						
30						
31		C			c	
32		C				
33						
34	C					
35						
36						
37	b			C		c
38						
39	A					
106						
134						
139						

ADFom

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

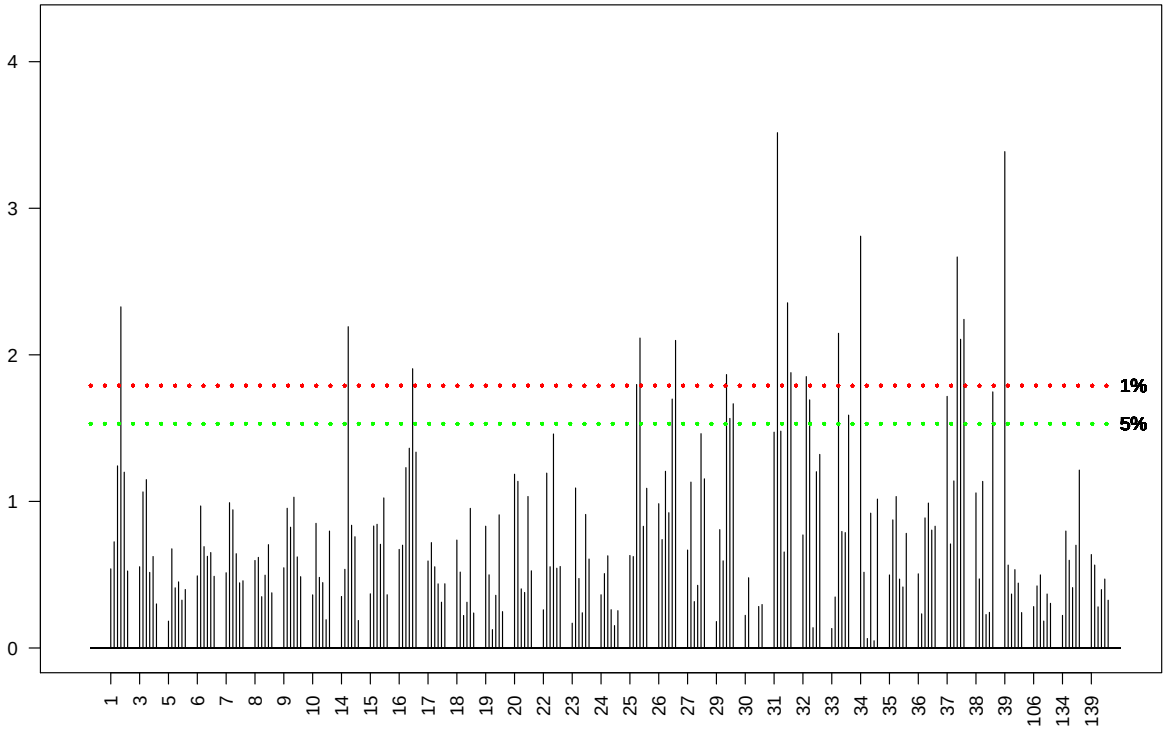
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

ADFom

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

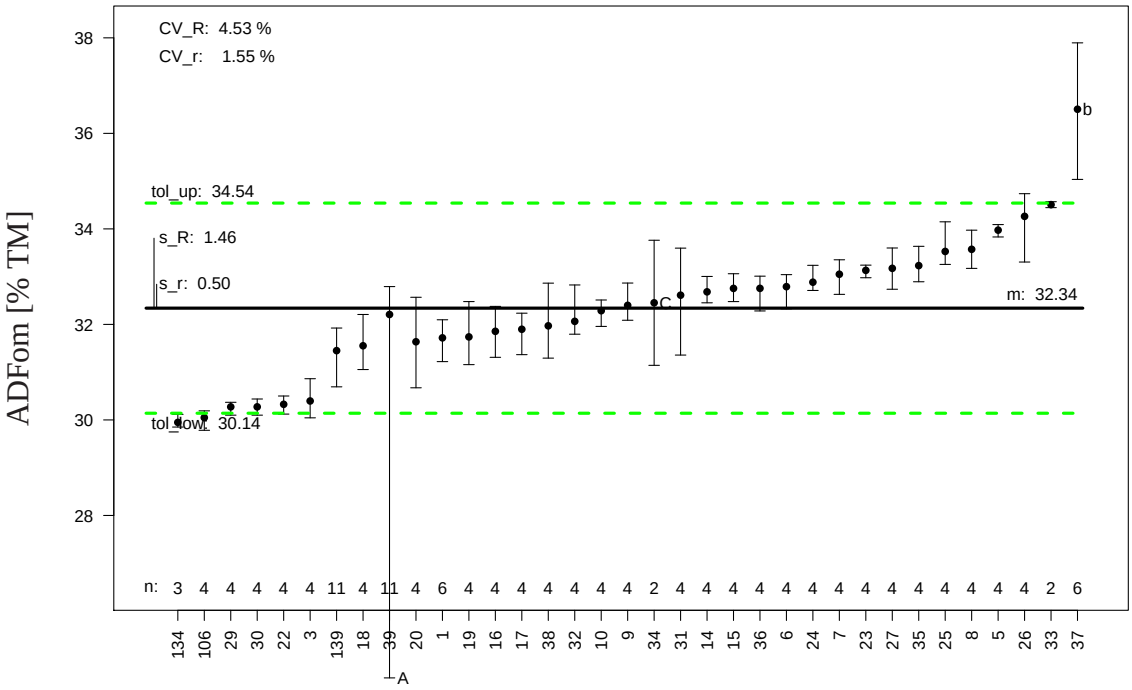
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

16.4 Einzelproben / Single Samples

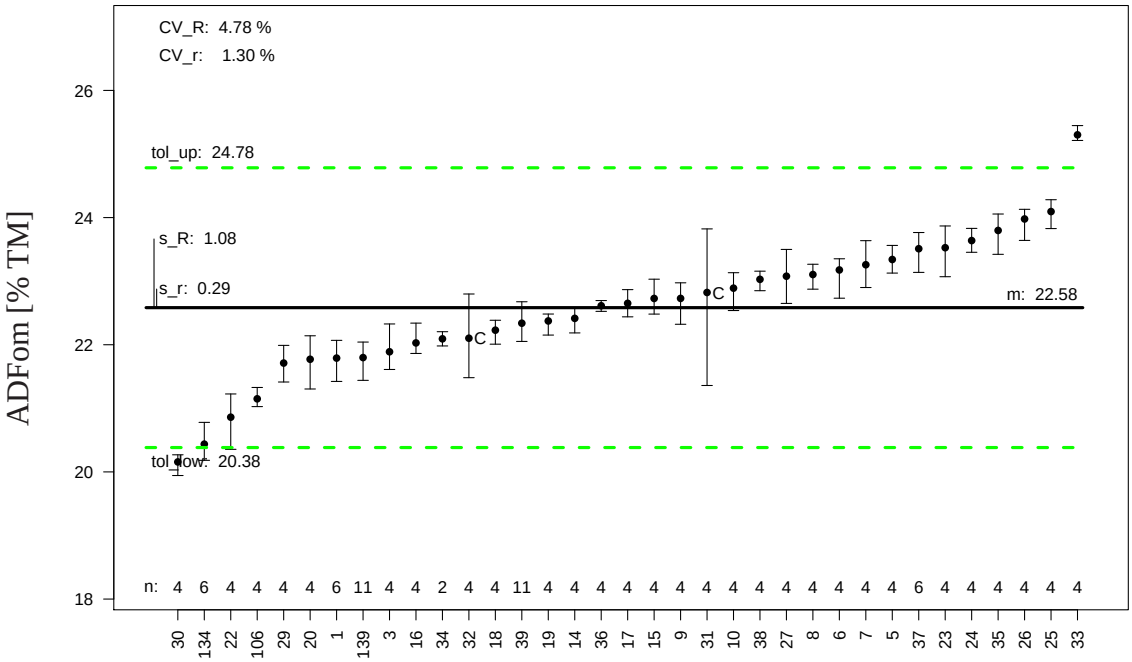
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

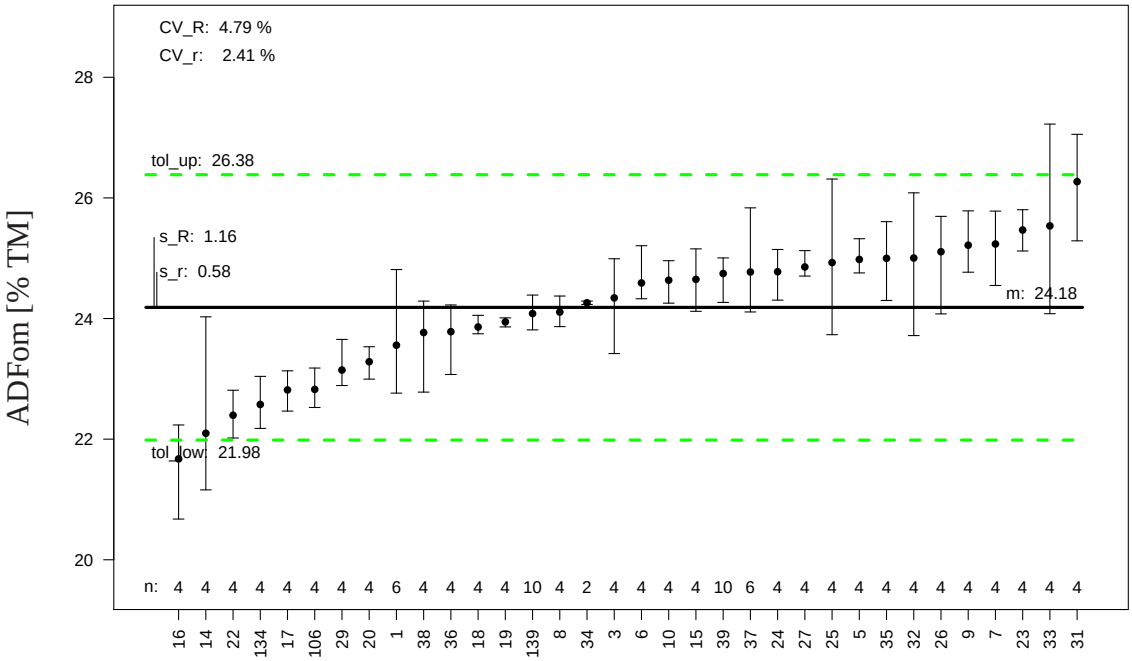
Probe/Sample 1901:



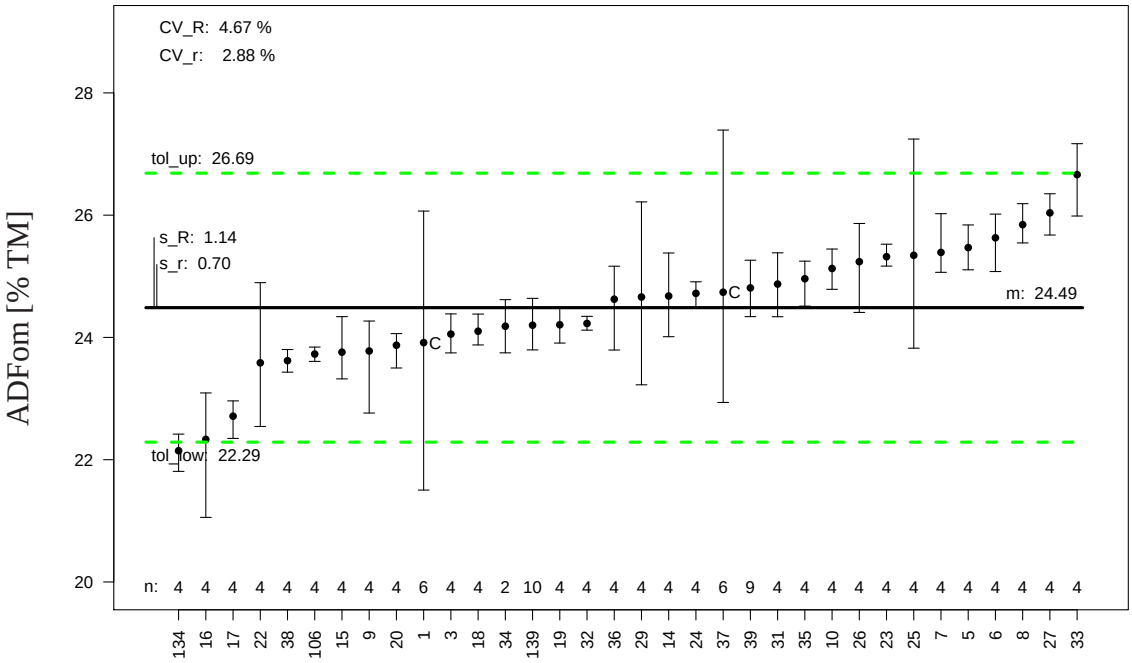
Probe/Sample 1902:



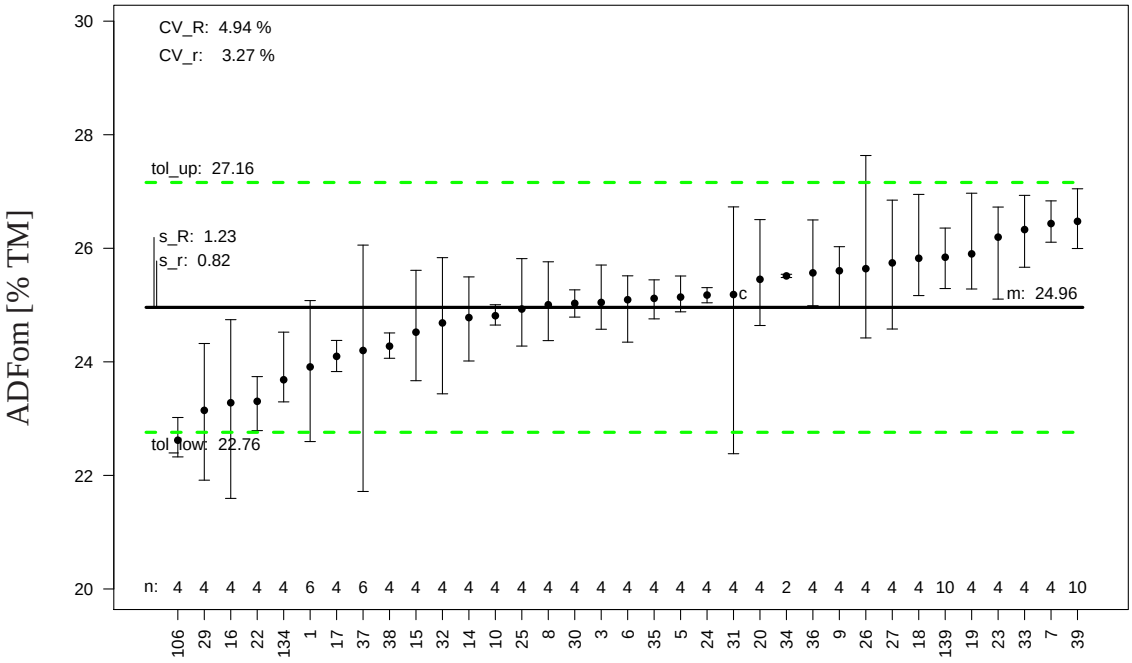
Probe/Sample 1903:



Probe/Sample 1904:

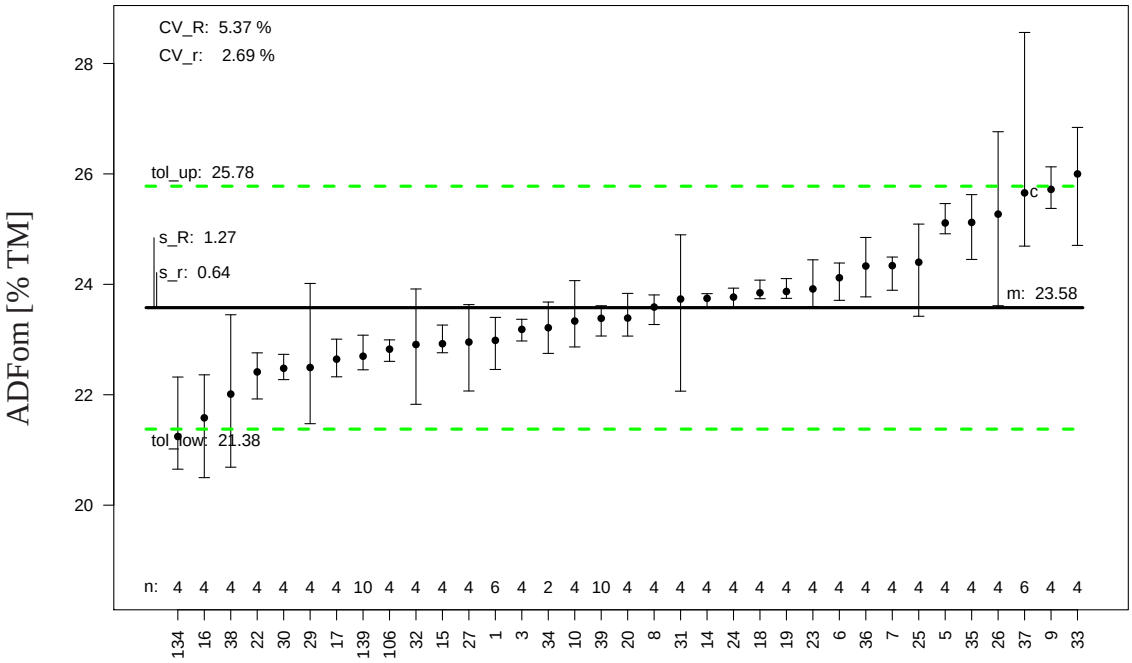


Probe/Sample 1905:



ADFom

Probe/Sample 1906:



17 Merkmal / Constituent: Elos / Cellulase

Einheit / Unit: % TM

17.1 Anmerkungen / Annotations

17.2 Laborbeurteilung / Proficiency Test

In Anlehnung an / *according to:* DIN ISO 13528.

Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wurde die Vergleichbarkeit der Methode, wie sie in der Norm VDLUFA ASR beschrieben ist, herangezogen.

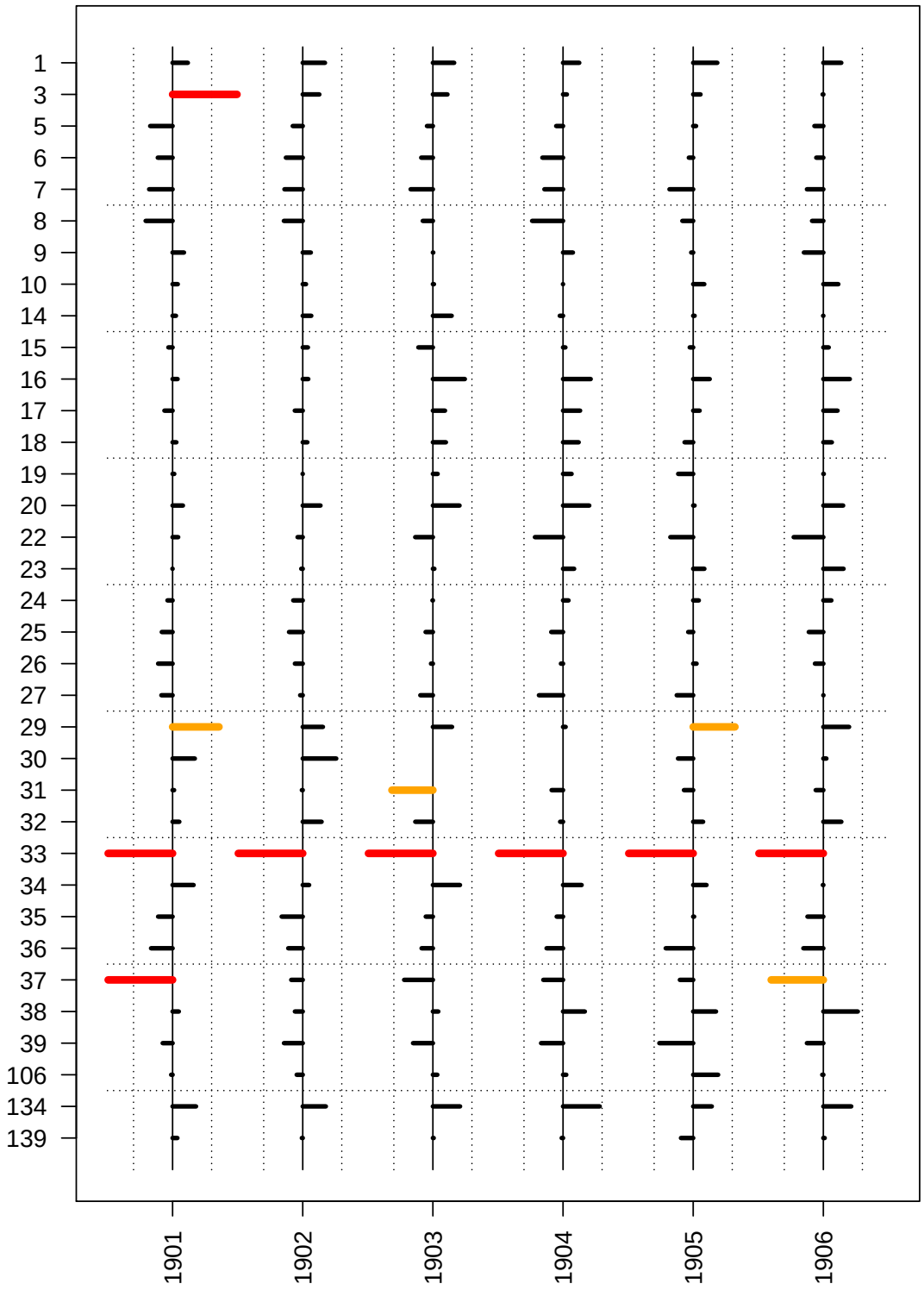
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.75 % TM

Quelle / Source: VDLUFA ASR

Elos / Cellulase

z-Werte / z Scores



Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur waagerechten Orientierung. Senkrecht finden sich die Labore, waagerecht jeweils die Proben. Die Balken für die verschiedenen Proben liegen auf einer Ebene nebeneinander.

Orange Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert $-3 <=$ z-Wert $<= 3$ haben. Rote Balken markieren Labore, deren Labormittelwert für diese Probe einen z-Wert kleiner -3 oder größer 3 aufweist.

Die nummerische Darstellung der z-Werte findet sich im Anhang.

The vertical dashed lines mark a z score of -2 and 2. The horizontal dashed lines are reading aids. Laboratories are listed vertically, samples horizontally. The bars for all samples from one lab are listed horizontally.

Orange bars mark labs, which lab mean for this sample has a z score $-3 <=$ *z score* $<= 3$*. Red bars are used to mark labs, which lab mean for this samples have a z score smaller than -3 or larger than 3.*

The nummerical z scores are listed in the appendix.

Systematische Labordifferenz / lab bias

Probe/Sample	1901		1902		1903		1904		1905		1906		Differenz	
Labor/Lab	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[1]	Δ[2]	m[3]	SD[4]
1	59.61	1.37	73.53	1.99	70.14	1.91	69.25	1.45	68.90	2.16	70.84	1.61		
3	64.68	6.44	73.03	1.49	69.54	1.30	68.14	0.34	67.40	0.65	69.17	-0.06		
5	56.24	-2.00	70.65	-0.89	67.71	-0.53	67.19	-0.61	67.00	0.26	68.44	-0.80		
6	56.92	-1.32	70.03	-1.51	67.19	-1.05	65.95	-1.85	66.35	-0.39	68.60	-0.63		
7	56.15	-2.10	69.91	-1.64	66.25	-1.99	66.13	-1.67	64.62	-2.12	67.77	-1.47		
8	55.83	-2.41	69.85	-1.69	67.33	-0.91	65.03	-2.77	65.77	-0.97	68.22	-1.01		
9	59.27	1.02	72.27	0.72	68.27	0.03	68.68	0.88	66.56	-0.18	67.49	-1.74		
10	58.71	0.46	71.83	0.29	68.33	0.09	67.79	-0.01	67.73	0.99	70.58	1.34		
14	58.55	0.30	72.31	0.76	69.92	1.68	67.51	-0.29	66.87	0.13	69.22	-0.02		
15	57.87	-0.38	72.01	0.46	66.94	-1.30	68.01	0.21	66.43	-0.31	69.71	0.48		
16	58.69	0.45	72.04	0.49	71.10	2.86	70.27	2.48	68.22	1.48	71.61	2.37		
17	57.52	-0.73	70.83	-0.71	69.32	1.08	69.33	1.53	67.32	0.58	70.51	1.27		
18	58.58	0.34	71.96	0.41	69.40	1.16	69.20	1.40	65.97	-0.77	70.00	0.76		
19	58.39	0.15	71.54	-0.01	68.67	0.43	68.56	0.76	65.40	-1.34	69.27	0.04		
20	59.17	0.92	73.13	1.59	70.62	2.39	70.15	2.35	66.86	0.12	71.01	1.77		
22	58.75	0.50	71.08	-0.46	66.66	-1.58	65.28	-2.52	64.69	-2.05	66.58	-2.66		
23	58.23	-0.01	71.41	-0.13	68.37	0.13	68.79	0.99	67.74	1.00	71.05	1.81		
24	57.79	-0.46	70.70	-0.85	68.20	-0.04	68.29	0.49	67.24	0.50	69.95	0.72		
25	57.28	-0.97	70.32	-1.23	67.59	-0.65	66.74	-1.06	66.30	-0.44	67.93	-1.30		
26	56.95	-1.29	70.84	-0.70	68.07	-0.17	67.61	-0.19	67.04	0.30	68.48	-0.75		
27	57.24	-1.00	71.32	-0.23	67.11	-1.12	65.64	-2.16	65.27	-1.47	69.24	0.01		
29	62.41	4.16	73.35	1.81	69.96	1.72	68.03	0.23	70.48	3.74	71.54	2.31		
30	60.24	1.99	74.54	3.00					65.38	-1.36	69.51	0.27		
31	58.38	0.13	71.47	-0.08	64.57	-3.67	66.78	-1.02	65.91	-0.83	68.55	-0.68		
32	58.85	0.60	73.23	1.69	66.66	-1.58	67.54	-0.26	67.63	0.89	70.85	1.61		
33	48.75	-9.49	61.45	-10.09	60.38	-7.85	58.40	-9.40	59.66	-7.08	59.97	-9.27		
34	60.13	1.88	72.11	0.57	70.67	2.43	69.46	1.66	67.93	1.19	69.19	-0.04		
35	56.95	-1.30	69.66	-1.89	67.60	-0.64	67.23	-0.57	66.82	0.08	67.81	-1.42		
36	56.32	-1.93	70.25	-1.30	67.23	-1.01	66.32	-1.47	64.28	-2.46	67.45	-1.79		
37	52.13	-6.11	70.51	-1.03	65.66	-2.58	66.03	-1.77	65.55	-1.19	64.56	-4.68		
38	58.80	0.56	70.84	-0.70	68.72	0.48	69.75	1.95	68.78	2.04	72.32	3.09		
39	57.36	-0.89	69.86	-1.68	66.46	-1.78	65.83	-1.97	63.71	-3.03	67.76	-1.47		
106	58.12	-0.13	71.00	-0.54	68.63	0.39	68.09	0.29	68.98	2.23	69.14	-0.09		
134	60.35	2.10	73.61	2.07	70.67	2.43	71.08	3.29	68.41	1.67	71.73	2.50		
139	58.68	0.43	71.47	-0.08	68.31	0.07	67.68	-0.12	65.65	-1.09	69.35	0.12		

[1] Mittelwert der Analysen dieses Labores / *Mean of analyses of this lab*
[2] Differenz zum "wahren Wert" / *Differences to "true value"*
[3] Mittelwert der Differenzen / *Mean of differences*
[4] Standardabweichung der Differenzen / *Standard deviations of differences*

17.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	1901	1902	1903	1904	1905	1906	VDLUFA ASR
n	154	158	150	149	154	154	
p	35	35	34	34	35	35	
n_1	151	154	146	145	150	149	
p_1	34	34	33	33	34	34	
m	58.25	71.54	68.24	67.80	66.74	69.24	
s_r	0.66	0.47	0.80	0.98	1.06	0.77	
CV_r	1.14	0.65	1.17	1.45	1.58	1.11	
r	1.88	1.32	2.27	2.78	2.99	2.18	
s_R	2.20	1.35	1.71	1.75	1.84	1.78	1.75
CV_R	3.78	1.89	2.51	2.58	2.75	2.57	
R	6.22	3.83	4.85	4.96	5.20	5.03	4.95
HORRAT[1]	1.74	0.90	1.18	1.22	1.29	1.22	

[1] siehe Anmerkung zu HORRAT im Vorspann, S. 9
remark to HORRAT in preamble, page 9

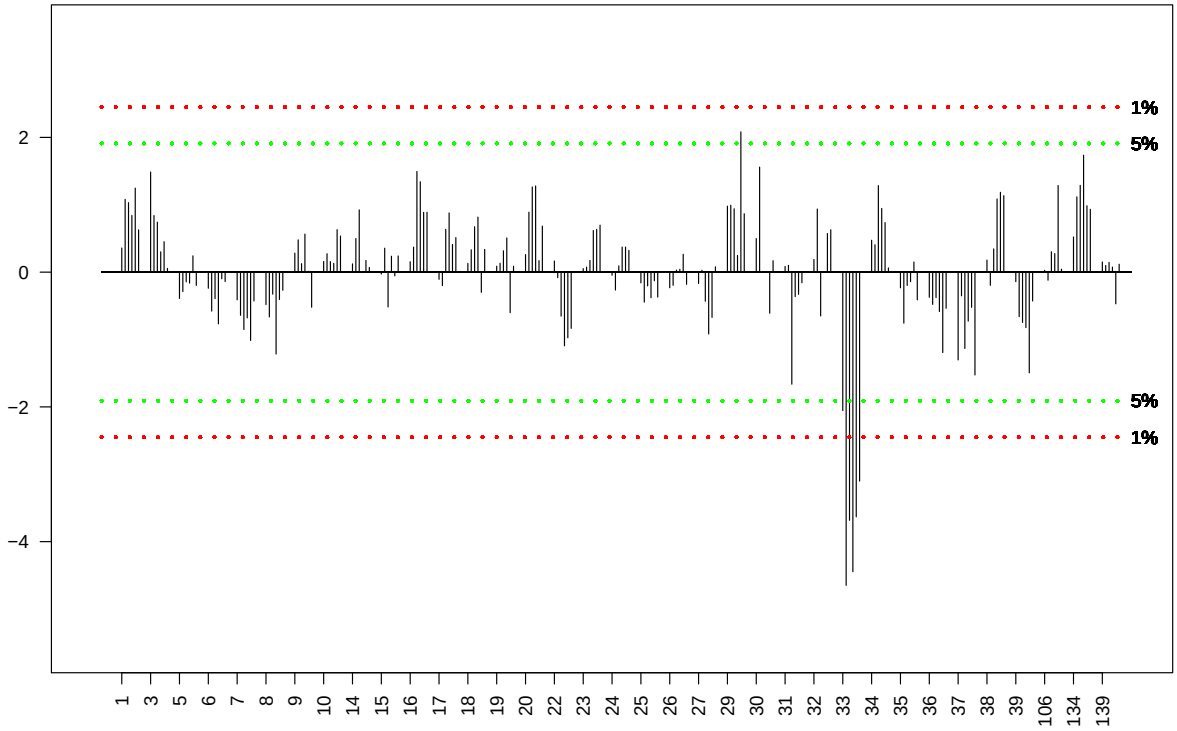
Ausreißer bei der Methodenbeschreibung nach ISO 5725 / Outlier in method description according to ISO 5725

In der folgenden Tabelle wird für jedes Labor angegeben, bei welchen Proben es als Ausreißer aufgefallen ist.

In the following table each lab is marked which was falged as an outlier for a sample.

Labor	*1901*	*1902*	*1903*	*1904*	*1905*	*1906*
1						
3	b					
5						
6						
7						
8						
9						
10						
14						
15						
16						
17						
18						
19						
20						
22						
23						
24						
25						
26						
27						
29						
30						
31		c			c	
32						
33	B	B	B	B	B	B
34	C		C	C		
35						
36						
37				C		
38						
39	A					
106						
134						
139						

Labormittelwertvergleich nach Mandels h / Lab mean comparison to Mandel's h



Oberste und unterste Linie 1%-Signifikanz-Niveau, mittlere Linien 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

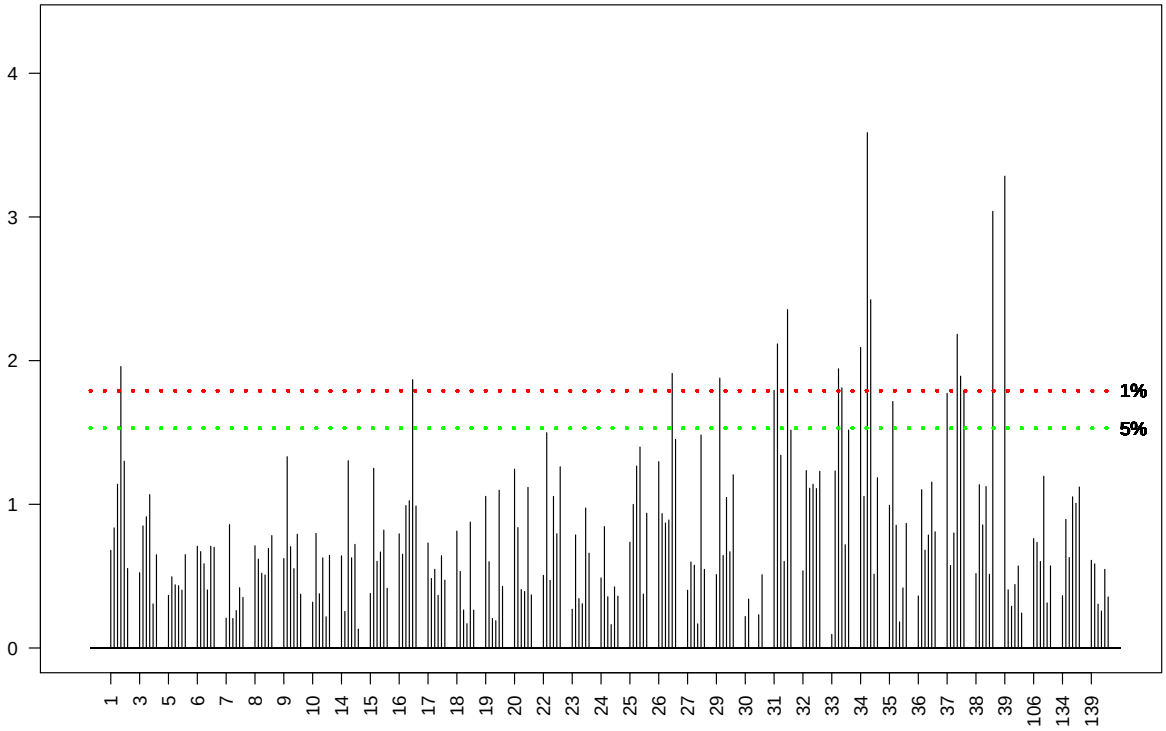
Balken nach unten sind negative Abweichungen des Messwertes dieser Proben, Balken nach oben positive Abweichungen. Die Länge der Balken ist normiert, so dass Proben mit unterschiedlichen Gehalten verglichen werden können.

Upper and lower lines 1% significance level, intermediate lines 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

Bars oriented downwards represent negative deviations for a sample, bar oriented upwards positive deviations. The bar lengths are normed, to allow to compare samples with different concentrations.

Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



Obere Linie 1%-Signifikanz-Niveau, untere Linie 5%-Signifikanz-Niveau.

Waagerecht finden sich die Labore mit jeweils einem Balken für jede Probe. Die Balken für die einzelnen Proben beginnen immer bei der Markierung der ganzen Zahl, d.h. z.B. für Labor 5 bei 5.0.

Die Balkenlänge ist die normierte laborinterne Streuung für die Wiederholungen dieser Probe. Lange Balken kennzeichnen eine große laborinterne Streuung.

Upper line 1% significance level, lower line 5% significance level.

The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

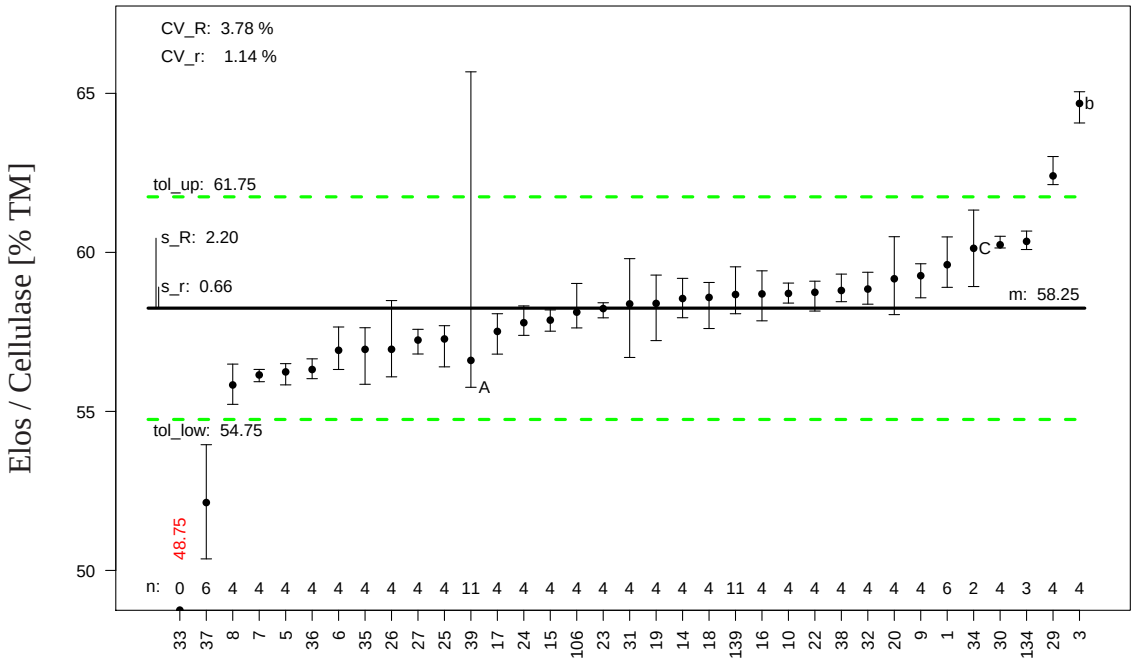
Bar lengths represent the lab internal repeatability. Long bars mark large deviations between repeats inside that laboratory.

17.4 Einzelproben / Single Samples

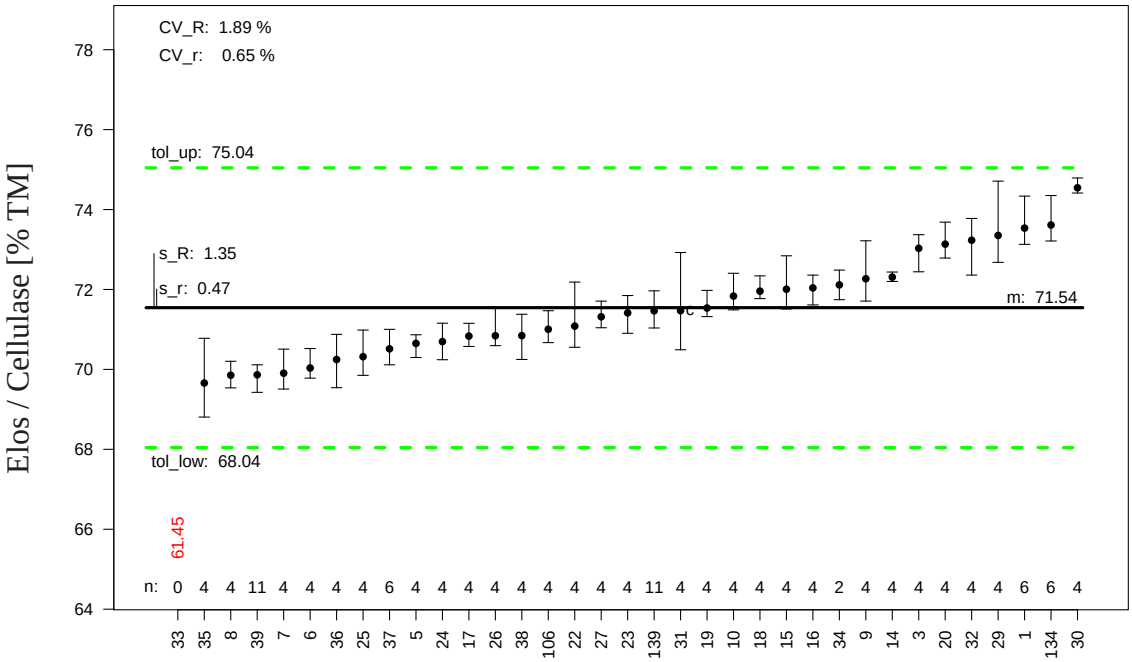
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden - sonst mit der Vergleichsstandardabweichung aus diesem Ringversuch berechneten Toleranz-Grenzen.

The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency trial.

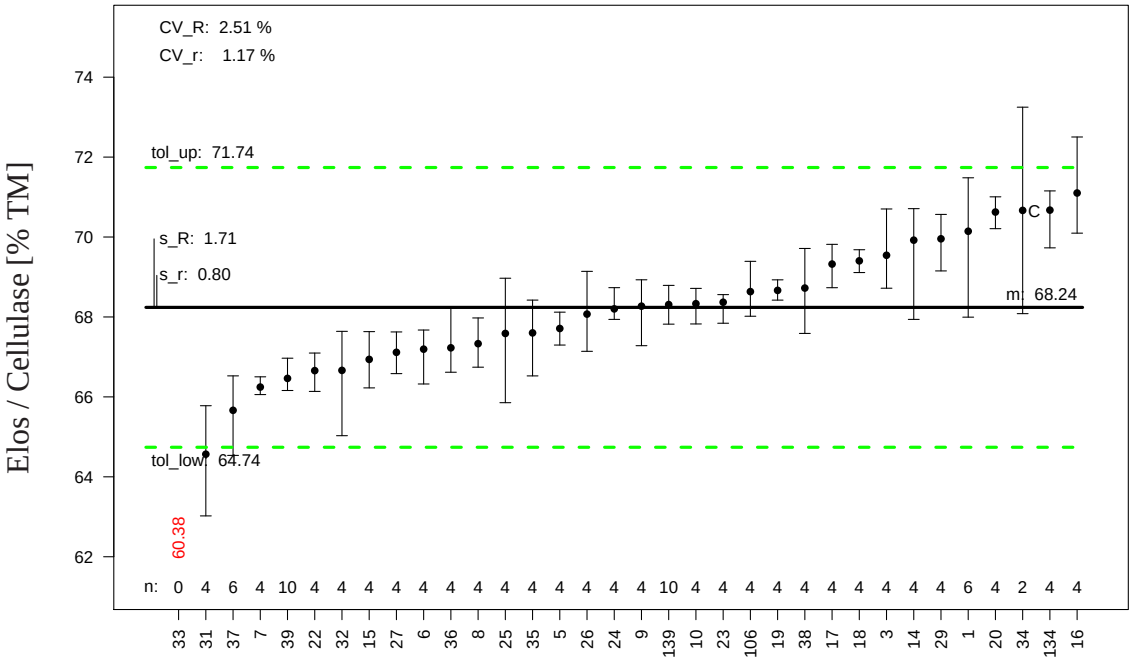
Probe/Sample 1901:



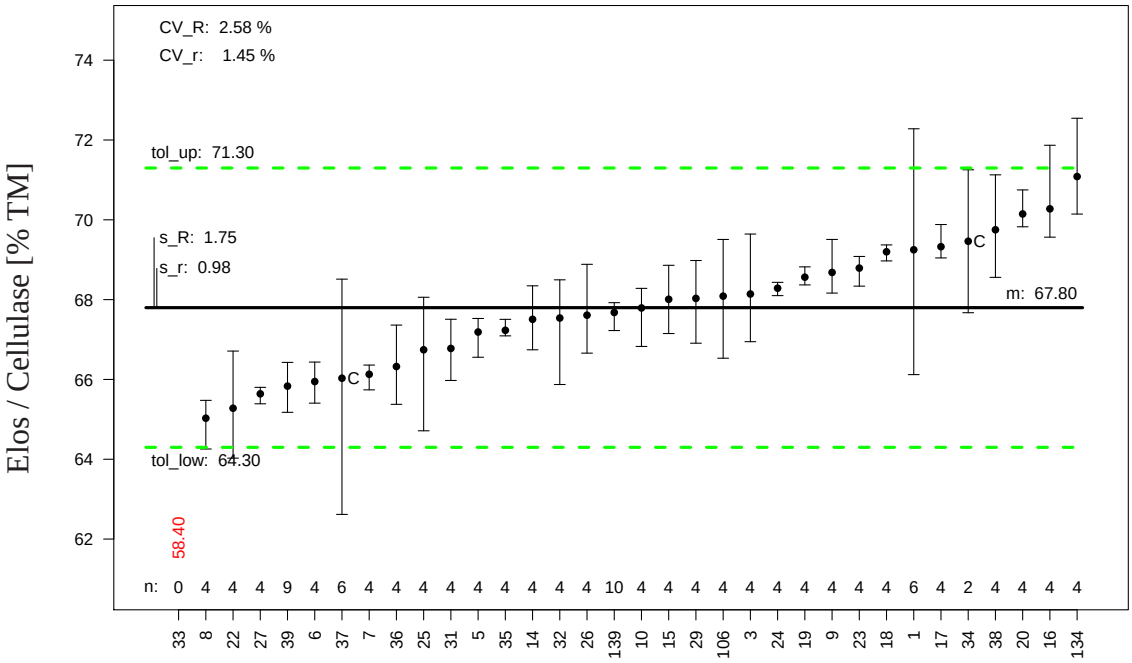
Probe/Sample 1902:



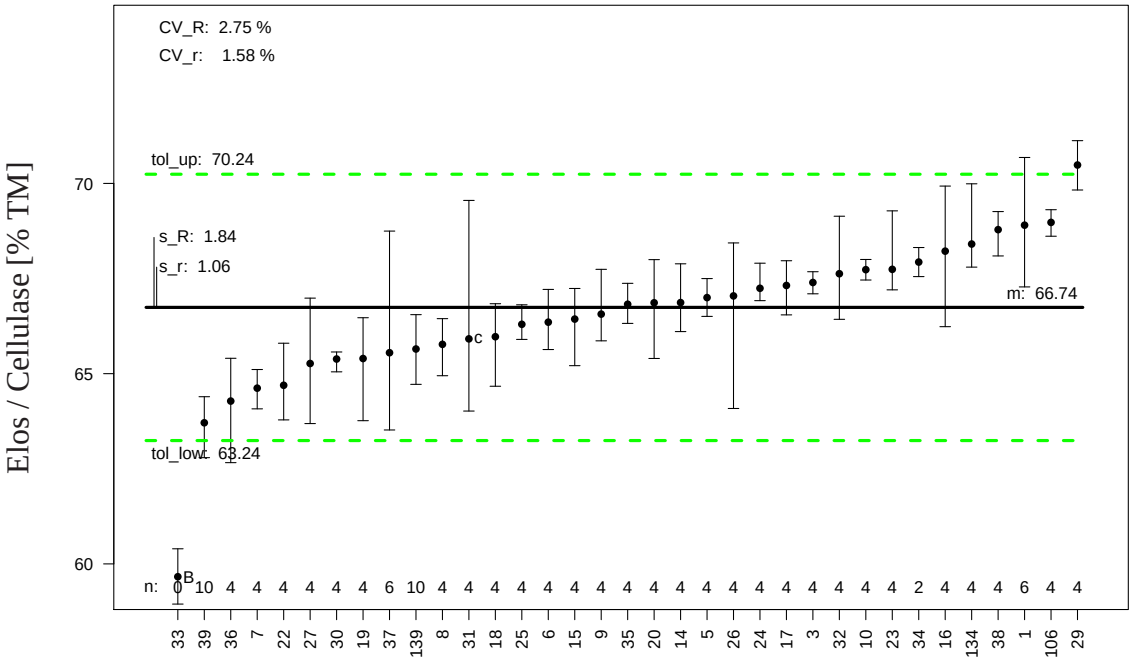
Probe/Sample 1903:



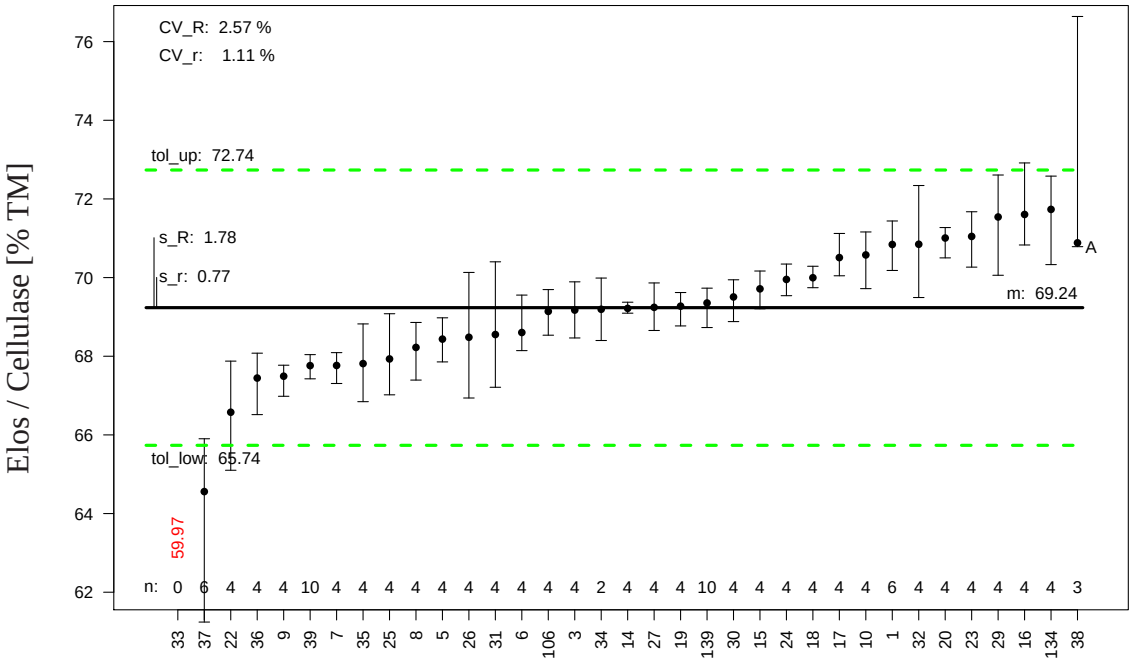
Probe/Sample 1904:



Probe/Sample 1905:



Probe/Sample 1906:



18 Anhang / Appendix

18.1 Trockenmasse / dry matter

18.1.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	0.40	0.51	0.25	0.17	0.25	0.14
3	0.59	0.53	0.86	0.68	0.78	0.76
5	-0.74	-0.91	-0.39	-0.60	-0.48	-0.45
6	-0.55	-0.74	-0.94	-0.76	-0.87	-0.75
7	-0.06	-0.55	0.31	0.53	0.10	-0.17
8	0.51	0.51	-0.64	-0.36	-0.27	-0.32
9	0.63	0.74	1.29	1.45	1.53	1.36
10	0.37	0.03	-0.19	0.18	0.14	0.09
14	0.57	0.71	0.72	0.38	0.18	0.04
15	0.82	0.73	0.35	0.37	-0.01	-0.03
16	-0.43	-0.28	-0.16	-0.19	-0.27	-0.21
17	-0.40	-0.34	-1.38	-1.34	-1.55	-1.90
18	-1.53	-1.34	-1.44	-1.30	-1.39	-0.95
19	-0.53	-0.60	-0.87	-1.07	-0.92	-0.60
20	-0.35	-0.22	-0.73	-0.63	-0.77	-0.19
22	-0.05	0.00	0.40	0.06	0.17	0.06
23	-0.61	-0.72	-0.38	-0.18	0.00	-0.13
24	1.14	1.20	0.78	0.77	0.85	0.53
25	1.65	1.86	1.25	1.15	1.44	1.26
26	-0.06	-0.38	-0.14	-0.03	-0.20	-0.39
27	1.27	1.00	0.73	0.88	0.60	0.61
29	1.71	1.71	1.34	2.15	1.68	1.51
30	0.33	0.14			-0.23	-0.19
31	0.07	0.07	-0.20	-0.31	-0.31	-0.30
32	0.70	0.83	0.39	0.36	0.15	0.24
33	-1.84	-1.45	-1.33	-1.05	-1.27	-1.18
34	0.05	-0.24	1.48	0.95	1.36	1.24
35	-0.59	-0.87	-1.56	-1.45	-1.33	-1.48
36	-1.76	-1.70	-2.12	-1.97	-1.80	-1.81
37	-1.25	-1.23	0.59	0.35	0.67	0.87
38	-0.25	0.09	-0.20	-0.96	-0.64	-0.71
39	1.48	1.55	1.38	1.46	1.55	1.68
106	-1.08	-0.70	-1.15	-0.93	-0.96	-0.86
134	-1.11	-1.01	0.63	0.12	0.60	0.83
139	0.90	1.07	1.04	1.14	1.21	1.40

18.1.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	91.05	0.06	91.12	91.08	90.98	91.00	91.08	91.01
1902	1	6	90.14	0.11	90.14	90.36	90.15	90.08	90.09	90.04
1903	1	6	91.56	0.22	91.72	91.67	91.50	91.81	91.24	91.40
1904	1	6	91.83	0.29	92.03	92.33	91.60	91.73	91.60	91.70
1905	1	6	91.51	0.20	91.47	91.84	91.53	91.51	91.21	91.53
1906	1	6	91.62	0.16	91.70	91.86	91.66	91.61	91.45	91.44
1901	3	4	91.20	0.13	91.13	91.34	91.26	91.06		
1902	3	4	90.16	0.17	90.41	90.12	90.03	90.07		
1903	3	4	92.05	0.10	91.94	92.17	91.98	92.11		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	92.30	0.31	92.54	92.58	92.05	92.02
1905	3	4	91.98	0.09	92.05	92.05	91.87	91.97
1906	3	4	92.21	0.23	92.25	92.51	92.14	91.95
1901	5	4	90.16	0.11	90.25	90.26	90.03	90.11
1902	5	4	89.05	0.05	89.01	88.99	89.10	89.08
1903	5	4	91.05	0.08	91.07	90.94	91.06	91.13
1904	5	4	91.14	0.06	91.15	91.08	91.11	91.21
1905	5	4	90.87	0.12	91.02	90.90	90.79	90.76
1906	5	4	91.06	0.09	91.00	91.04	91.19	91.03
1901	6	4	90.32	0.17	90.47	90.45	90.17	90.17
1902	6	4	89.18	0.07	89.21	89.26	89.10	89.14
1903	6	4	90.61	0.05	90.63	90.62	90.65	90.53
1904	6	4	91.00	0.02	91.00	91.00	91.02	90.97
1905	6	4	90.53	0.07	90.46	90.51	90.62	90.51
1906	6	4	90.78	0.10	90.65	90.88	90.81	90.77
1901	7	4	90.69	0.22	90.37	90.75	90.80	90.85
1902	7	4	89.33	0.29	89.45	88.89	89.50	89.46
1903	7	4	91.61	0.39	92.10	91.64	91.14	91.56
1904	7	4	92.16	0.30	92.53	91.96	91.87	92.26
1905	7	4	91.39	0.34	91.32	90.95	91.52	91.76
1906	7	4	91.33	0.29	91.22	91.53	90.97	91.61
1901	8	4	91.14	0.15	91.25	91.04	90.98	91.28
1902	8	4	90.15	0.15	90.02	90.19	90.05	90.34
1903	8	4	90.85	0.40 c	90.45	91.32	91.03	90.58
1904	8	4	91.36	0.20	91.35	91.24	91.65	91.19
1905	8	4	91.05	0.10	90.94	91.01	91.10	91.16
1906	8	4	91.19	0.29	90.92	91.36	90.98	91.51
1901	9	4	91.23	0.10	91.34	91.27	91.21	91.09
1902	9	4	90.32	0.08	90.30	90.24	90.43	90.32
1903	9	4	92.40	0.04	92.34	92.40	92.42	92.41
1904	9	4	92.99	0.09	93.09	92.88	93.01	92.97
1905	9	4	92.65	0.15	92.80	92.62	92.74	92.45
1906	9	4	92.78	0.14	92.75	92.77	92.97	92.63
1901	10	4	91.03	0.06	91.06	90.97	91.09	90.99
1902	10	4	89.77	0.07	89.72	89.83	89.71	89.83
1903	10	4	91.21	0.16	91.07	91.15	91.44	91.17
1904	10	4	91.84	0.07	91.84	91.89	91.75	91.90
1905	10	4	91.42	0.21	91.11	91.54	91.54	91.49
1906	10	4	91.57	0.27	91.42	91.36	91.55	91.96
1901	14	4	91.18	0.04	91.23	91.19	91.15	91.17
1902	14	4	90.30	0.02	90.27	90.29	90.33	90.30
1903	14	4	91.94	0.08	91.84	91.91	91.99	92.01
1904	14	4	92.02	0.09	91.94	91.99	92.16	92.00
1905	14	4	91.46	0.08	91.48	91.37	91.56	91.41
1906	14	4	91.53	0.08	91.53	91.64	91.46	91.50
1901	15	4	91.38	0.12	91.21	91.42	91.46	91.44
1902	15	4	90.32	0.08	90.28	90.23	90.41	90.34
1903	15	4	91.64	0.03	91.62	91.68	91.66	91.62
1904	15	4	92.01	0.10	91.97	92.15	91.93	92.00
1905	15	4	91.29	0.12	91.33	91.44	91.21	91.17
1906	15	4	91.47	0.18	91.33	91.72	91.38	91.43
1901	16	4	90.41	0.14	90.53	90.22	90.43	90.44
1902	16	4	89.53	0.05	89.56	89.55	89.56	89.46

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	91.23	0.13	91.17	91.39	91.10	91.27
1904	16	4	91.51	0.28	91.63	91.10	91.69	91.64
1905	16	4	91.05	0.29	90.86	91.05	91.47	90.84
1906	16	4	91.30	0.15	91.43	91.24	91.42	91.11
1901	17	4	90.43	0.05	90.42	90.41	90.40	90.50
1902	17	4	89.49	0.06	89.47	89.45	89.46	89.57
1903	17	4	90.26	0.05	90.23	90.32	90.28	90.22
1904	17	4	90.47	0.08	90.42	90.38	90.49	90.58
1905	17	4	89.91	0.10	89.99	90.01	89.85	89.80
1906	17	4	89.70	0.06	89.74	89.60	89.73	89.72
1901	18	4	89.55	0.16	89.70	89.38	89.66	89.46
1902	18	4	88.72	0.09	88.83	88.69	88.73	88.61
1903	18	4	90.21	0.09	90.11	90.32	90.22	90.20
1904	18	4	90.51	0.09	90.50	90.61	90.53	90.39
1905	18	4	90.06	0.18	90.31	90.07	89.93	89.94
1906	18	4	90.59	0.04	90.61	90.55	90.56	90.64
1901	19	4	90.32	0.14	90.46	90.14	90.42	90.28
1902	19	4	89.29	0.09	89.39	89.29	89.28	89.18
1903	19	4	90.66	0.15	90.58	90.87	90.66	90.54
1904	19	4	90.71	0.10	90.60	90.84	90.73	90.69
1905	19	4	90.48	0.09	90.57	90.52	90.45	90.38
1906	19	4	90.92	0.08	90.81	90.97	90.99	90.94
1901	20	4	90.47	0.23	90.72	90.22	90.60	90.34
1902	20	4	89.58	0.14	89.73	89.61	89.59	89.40
1903	20	4	90.78	0.09	90.80	90.90	90.74	90.67
1904	20	4	91.11	0.02	91.11	91.13	91.11	91.09
1905	20	4	90.61	0.15	90.80	90.64	90.56	90.44
1906	20	4	91.31	0.08	91.34	91.22	91.26	91.41
1901	22	4	90.70	0.07	90.76	90.60	90.71	90.72
1902	22	4	89.75	0.09	89.81	89.64	89.84	89.73
1903	22	4	91.68	0.11	91.77	91.78	91.66	91.54
1904	22	4	91.74	0.12	91.77	91.60	91.68	91.89
1905	22	4	91.44	0.10	91.40	91.59	91.36	91.43
1906	22	4	91.55	0.17	91.78	91.44	91.57	91.40
1901	23	4	90.27	0.10	90.31	90.11	90.29	90.35
1902	23	4	89.20	0.11	89.08	89.15	89.24	89.32
1903	23	4	91.06	0.13	91.10	91.01	91.22	90.91
1904	23	4	91.51	0.14	91.33	91.54	91.54	91.65
1905	23	4	91.30	0.07	91.37	91.33	91.22	91.26
1906	23	4	91.37	0.10	91.40	91.36	91.24	91.46
1901	24	4	91.62	0.29	92.05	91.47	91.58	91.41
1902	24	4	90.68	0.25	90.99	90.67	90.65	90.39
1903	24	4	91.99	0.23	92.20	91.86	92.16	91.72
1904	24	4	92.38	0.18	92.39	92.40	92.58	92.14
1905	24	4	92.05	0.19	92.32	91.90	92.04	91.93
1906	24	4	91.99	0.19	92.24	91.86	92.06	91.83
1901	25	4	92.03	0.12	91.86	92.05	92.10	92.11
1902	25	4	91.18	0.16	91.38	91.01	91.23	91.12
1903	25	4	92.36	0.18	92.45	92.53	92.11	92.34
1904	25	4	92.72	0.22	93.02	92.60	92.52	92.72
1905	25	4	92.58	0.25	92.37	92.39	92.67	92.88
1906	25	4	92.68	0.23	92.47	92.64	92.61	93.00
1901	26	4	90.69	0.19	90.47	90.86	90.60	90.83

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	89.46	0.29	89.67	89.24	89.18	89.75
1903	26	4	91.25	0.18	91.47	91.27	91.21	91.04
1904	26	4	91.65	0.36	91.53	92.03	91.22	91.83
1905	26	4	91.12	0.19	91.16	91.28	91.20	90.85
1906	26	4	91.12	0.41	90.83	91.27	90.75	91.62
1901	27	4	91.73	0.30	91.69	91.38	91.72	92.11
1902	27	4	90.52	0.11	90.52	90.44	90.44	90.67
1903	27	4	91.95	0.09	91.97	92.02	91.81	91.99
1904	27	4	92.47	0.22	92.60	92.71	92.27	92.31
1905	27	4	91.83	0.21	91.82	91.63	91.75	92.12
1906	27	4	92.06	0.21	91.83	92.27	92.21	91.95
1901	29	4	92.07	0.18	92.21	92.20	91.82	92.07
1902	29	4	91.07	0.17	90.98	91.14	90.89	91.27
1903	29	4	92.43	0.12	92.50	92.30	92.57	92.36
1904	29	4	93.62	0.21	93.79	93.34	93.61	93.76
1905	29	4	92.79	0.53C	93.25	92.43	93.22	92.24
1906	29	4	92.91	0.27	93.12	92.52	93.00	93.02
1901	30	4	90.99	0.16	90.80	90.95	91.04	91.18
1902	30	4	89.86	0.24	89.57	89.76	89.98	90.11
1905	30	4	91.09	0.18	90.91	91.02	91.12	91.33
1906	30	4	91.31	0.19	91.08	91.25	91.41	91.50
1901	31	4	90.80	0.31	90.53	91.23	90.62	90.80
1902	31	4	89.81	0.31	89.64	90.28	89.64	89.67
1903	31	4	91.20	0.22	90.91	91.31	91.41	91.17
1904	31	4	91.40	0.24	91.41	91.24	91.73	91.21
1905	31	4	91.02	0.37	90.60	90.90	91.48	91.08
1906	31	4	91.21	0.42	91.11	91.80	90.81	91.12
1901	32	4	91.28	0.36	91.47	90.75	91.36	91.56
1902	32	4	90.39	0.18	90.18	90.62	90.37	90.39
1903	32	4	91.67	0.48C	90.96	92.00	91.78	91.93
1904	32	4	92.01	0.14	91.85	92.00	92.19	91.98
1905	32	4	91.43	0.24	91.19	91.60	91.27	91.66
1906	32	4	91.72	0.32	91.74	92.11	91.32	91.71
1901	33	2	89.31	0.09	89.37	89.24		
1902	33	4	88.63	0.04	88.67	88.66	88.60	88.60
1903	33	4	90.30	0.16	90.23	90.52	90.29	90.15
1904	33	4	90.74	0.28	91.09	90.82	90.47	90.57
1905	33	4	90.17	0.23	90.50	90.11	90.03	90.02
1906	33	4	90.38	0.28	90.52	90.58	90.44	89.98
1901	34	2	90.78	0.38	90.51	91.05		
1902	34	2	89.57	0.16	89.68	89.45		
1903	34	2	92.54	0.16	92.43	92.65		
1904	34	2	92.54	0.41	92.83	92.25		
1905	34	2	92.50	0.08	92.56	92.44		
1906	34	2	92.66	0.12	92.75	92.58		
1901	35	4	90.28	0.16	90.41	90.36	90.31	90.05
1902	35	4	89.08	0.11	89.09	89.24	88.98	89.02
1903	35	4	90.11	0.08	90.22	90.13	90.06	90.04
1904	35	4	90.37	0.07	90.33	90.47	90.36	90.33
1905	35	4	90.11	0.04	90.07	90.13	90.17	90.09
1906	35	4	90.09	0.07	90.15	90.05	90.16	90.02
1901	36	4	89.37	0.13	89.52	89.24	89.28	89.44
1902	36	4	88.44	0.06	88.36	88.50	88.49	88.43

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	89.66	0.04	89.61	89.70	89.67	89.66				
1904	36	4	89.90	0.16	89.71	90.10	89.89	89.92				
1905	36	4	89.69	0.10	89.78	89.74	89.70	89.56				
1906	36	4	89.78	0.12	89.90	89.62	89.79	89.83				
1901	37	6	89.77	0.23	90.19	89.68	89.76	89.82	89.55	89.62		
1902	37	6	88.80	0.08	88.92	88.70	88.76	88.86	88.79	88.79		
1903	37	6	91.84	0.27	91.82	92.03	91.87	91.99	91.99	91.32		
1904	37	6	92.00	0.44	92.59	91.99	92.08	91.64	92.31	91.38		
1905	37	6	91.89	0.34	92.36	91.46	92.19	91.96	91.64	91.73		
1906	37	6	92.31	0.17	92.11	92.18	92.56	92.47	92.23	92.31		
1901	38	4	90.55	0.31	90.39	90.99	90.52	90.29				
1902	38	4	89.82	0.15	89.83	89.65	90.01	89.79				
1903	38	4	91.20	0.05	91.22	91.25	91.19	91.14				
1904	38	4	90.82	0.19	90.91	91.04	90.62	90.70				
1905	38	4	90.73	0.08	90.82	90.75	90.73	90.62				
1906	38	4	90.82	0.39	90.94	91.22	90.29	90.84				
1901	39	12	91.89	0.48 c	91.21	91.38	91.56	91.78	91.71	91.94	91.89	92.04
1902	39	11	90.94	0.26	90.60	90.47	90.75	90.77	91.00	91.08	91.02	91.12
1903	39	10	92.47	0.22	92.03	92.18	92.36	92.53	92.45	92.54	92.53	92.68
1904	39	9	93.00	0.25	92.53	92.85	92.80	92.99	93.03	93.05	93.30	93.14
1905	39	10	92.67	0.13	92.43	92.49	92.58	92.64	92.71	92.73	92.71	92.74
1906	39	10	93.08	0.19	92.91	92.78	93.05	92.90	93.13	92.99	93.27	93.22
1901	106	4	89.90	0.12	90.07	89.80	89.84	89.90				
1902	106	4	89.21	0.04	89.19	89.23	89.17	89.25				
1903	106	4	90.44	0.09	90.37	90.45	90.56	90.37				
1904	106	4	90.84	0.08	90.89	90.72	90.87	90.88				
1905	106	4	90.44	0.06	90.41	90.52	90.47	90.39				
1906	106	4	90.68	0.07	90.70	90.73	90.72	90.58				
1901	134	3	89.87	0.17	90.05	89.71	89.86					
1902	134	6	88.97	0.07	89.03	88.98	89.00	89.04	88.93	88.84		
1903	134	4	91.86	0.19	91.70	91.78	91.83	92.14				
1904	134	4	91.78	0.34	92.10	92.06	91.44	91.54				
1905	134	4	91.83	0.32	92.05	92.06	91.81	91.38				
1906	134	4	92.28	0.09	92.36	92.35	92.19	92.21				
1901	139	11	91.44	0.36	90.81	90.88	91.09	91.42	91.56	91.52	91.78	91.61
1902	139	11	90.58	0.31	89.98	90.28	90.24	90.40	90.67	90.69	90.75	90.74
1903	139	10	92.20	0.21	91.81	91.89	92.15	92.18	92.28	92.18	92.38	92.31
1904	139	10	92.71	0.18	92.47	92.43	92.62	92.60	92.78	92.64	92.96	92.78
1905	139	10	92.37	0.13	92.18	92.23	92.19	92.34	92.43	92.42	92.42	92.48
1906	139	10	92.81	0.27	92.27	92.74	92.58	92.81	92.64	92.96	92.89	93.12

18.2 Rohprotein / XP

18.2.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	0.84	1.07	0.93	1.23	1.45	1.41
3	2.61	1.88	1.79	2.03	2.07	2.18
5	-0.52	0.15	-0.73	-0.48	-0.23	-1.31
6	1.08	1.12	0.73	0.45	0.95	0.87
7	1.28	0.50	0.28	0.54	0.38	0.54
8	-1.08	-0.82	-0.60	-0.36	-0.16	-0.24
9	-0.85	-1.32	-1.91	-1.48	-1.47	-2.50
10	-0.17	-0.35	-0.37	-0.82	-0.35	0.03
14	-0.77	-0.59	1.02	-0.47	0.01	-0.13
15	-0.52	-0.68	-0.31	0.25	-0.16	0.07
16	0.01	0.60	0.92	1.28	1.31	1.68
17	0.05	-0.45	-0.19	0.72	-0.59	0.18
18	1.16	0.71	0.80	0.42	0.26	0.33
19	0.96	0.65	0.56	0.36	0.16	0.43
20	0.69	1.14	1.15	0.71	0.55	0.98
22	1.42	1.25	1.09	1.34	1.36	1.36
23	0.44	0.25	-0.02	0.04	-0.05	0.03
24	-0.15	-0.25	-0.16	0.17	-0.25	0.10
25	-1.51	-1.82	-1.20	-1.27	-0.90	-1.25
26	0.16	0.48	1.03	-0.16	0.98	0.19
27	-0.43	-0.41	-0.12	-1.16	-0.07	0.38
29	0.42	0.10	0.74	-0.39	0.93	1.05
30	1.76	1.09			0.26	1.05
31	-0.15	0.27	0.18	0.75	0.58	0.37
32	0.73	1.19	0.76	1.38	0.78	0.98
33	5.37	5.16	5.40	5.17	5.63	5.14
34	-1.60	-0.33	-1.14	-0.51	-1.34	-0.52
35	-0.50	-0.67	-0.84	-0.32	-0.25	-1.23
36	-1.00	-1.17	-0.60	-0.51	-1.08	-1.43
37	-1.61	-0.75	0.12	-0.40	0.54	-1.68
38	-1.50	-1.23	-0.19	-0.52	-0.37	-0.08
39	-0.92	-0.88	-1.69	-1.49	-2.50	-1.71
106	-0.07	-0.10	-0.03	0.02	0.39	0.39
134	1.13	0.67	-0.03	0.46	-0.37	-0.50
139	-1.39	-1.30	-1.95	-1.80	-2.85	-2.02

18.2.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	5.74	0.09	5.68	5.66	5.70	5.70	5.86	5.87
1902	1	6	6.50	0.03	6.52	6.46	6.48	6.48	6.50	6.55
1903	1	6	6.18	0.06	6.24	6.25	6.17	6.10	6.14	6.18
1904	1	6	6.58	0.20	6.61	6.24	6.82	6.67	6.63	6.48
1905	1	6	6.05	0.15	6.17	6.21	6.07	5.80	6.01	6.05
1906	1	6	6.40	0.06	6.34	6.46	6.47	6.37	6.34	6.42
1901	3	4	6.19	0.10	6.29	6.25	6.12	6.08		
1902	3	4	6.70	0.04	6.74	6.65	6.68	6.74		
1903	3	4	6.40	0.06	6.38	6.34	6.39	6.48		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	6.78	0.14	6.76	6.97	6.62	6.76
1905	3	4	6.21	0.15	6.33	6.06	6.10	6.34
1906	3	4	6.59	0.09	6.46	6.62	6.67	6.62
1901	5	4	5.40	0.06	5.40	5.33	5.47	5.42
1902	5	4	6.27	0.06	6.20	6.22	6.33	6.32
1903	5	4	5.77	0.05	5.76	5.81	5.80	5.70
1904	5	4	6.15	0.08	6.08	6.26	6.10	6.16
1905	5	4	5.63	0.09	5.67	5.74	5.59	5.53
1906	5	4	5.72	0.07	5.79	5.76	5.70	5.64
1901	6	4	5.80	0.05	5.83	5.76	5.76	5.87
1902	6	4	6.51	0.04	6.46	6.49	6.57	6.52
1903	6	4	6.13	0.09	6.21	6.12	6.01	6.19
1904	6	4	6.38	0.09	6.48	6.40	6.38	6.27
1905	6	4	5.93	0.03	5.94	5.97	5.90	5.90
1906	6	4	6.27	0.05	6.24	6.23	6.25	6.35
1901	7	4	5.85	0.21 c	6.11	5.67	5.68	5.96
1902	7	4	6.36	0.19C	6.25	6.54	6.49	6.15
1903	7	4	6.02	0.16	5.87	6.08	6.22	5.91
1904	7	4	6.40	0.17	6.22	6.31	6.59	6.49
1905	7	4	5.78	0.18	5.77	6.04	5.71	5.61
1906	7	4	6.18	0.05	6.25	6.17	6.18	6.13
1901	8	4	5.26	0.04	5.30	5.24	5.29	5.23
1902	8	4	6.02	0.06	6.08	6.06	5.98	5.97
1903	8	4	5.80	0.03	5.82	5.76	5.83	5.80
1904	8	4	6.18	0.09	6.20	6.30	6.10	6.11
1905	8	4	5.65	0.06	5.69	5.65	5.68	5.57
1906	8	4	5.99	0.10	5.99	6.04	6.08	5.85
1901	9	4	5.32	0.06	5.28	5.41	5.34	5.27
1902	9	4	5.90	0.05	5.95	5.85	5.87	5.93
1903	9	4	5.47	0.05	5.51	5.50	5.40	5.47
1904	9	4	5.90	0.10	6.03	5.85	5.93	5.79
1905	9	4	5.32	0.03	5.29	5.30	5.34	5.35
1906	9	4	5.42	0.11	5.57	5.39	5.32	5.42
1901	10	4	5.49	0.06	5.53	5.54	5.41	5.49
1902	10	4	6.14	0.03	6.15	6.16	6.16	6.10
1903	10	4	5.86	0.12	6.03	5.75	5.83	5.82
1904	10	4	6.06	0.05	6.14	6.04	6.04	6.04
1905	10	4	5.60	0.06	5.69	5.56	5.56	5.60
1906	10	4	6.06	0.04	6.09	6.09	6.04	6.00
1901	14	4	5.34	0.04	5.31	5.32	5.39	5.34
1902	14	4	6.08	0.06	6.15	6.11	6.03	6.04
1903	14	4	6.21	0.16	6.24	6.29	6.32	5.98
1904	14	4	6.15	0.05	6.10	6.16	6.13	6.21
1905	14	4	5.69	0.07	5.66	5.60	5.75	5.74
1906	14	4	6.02	0.12	6.19	5.91	5.99	5.98
1901	15	4	5.40	0.08	5.52	5.41	5.35	5.34
1902	15	4	6.06	0.05	6.06	6.04	6.01	6.13
1903	15	4	5.87	0.07	5.77	5.95	5.91	5.87
1904	15	4	6.33	0.12	6.34	6.26	6.49	6.23
1905	15	4	5.65	0.04	5.63	5.67	5.69	5.61
1906	15	4	6.07	0.06	6.10	6.00	6.03	6.14
1901	16	4	5.54	0.03	5.54	5.54	5.50	5.57
1902	16	4	6.38	0.03	6.37	6.35	6.37	6.42

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	6.18	0.09	6.29	6.21	6.10	6.11
1904	16	4	6.59	0.22	6.74	6.31	6.51	6.79
1905	16	4	6.02	0.16	6.14	5.92	6.16	5.84
1906	16	4	6.47	0.13	6.66	6.46	6.38	6.38
1901	17	4	5.55	0.09	5.58	5.44	5.65	5.52
1902	17	4	6.12	0.08	6.09	6.10	6.05	6.23
1903	17	4	5.90	0.02	5.91	5.91	5.87	5.91
1904	17	4	6.45	0.21	6.22	6.32	6.64	6.62
1905	17	4	5.54	0.03	5.58	5.55	5.51	5.52
1906	17	4	6.09	0.04	6.07	6.06	6.12	6.13
1901	18	4	5.82	0.05	5.84	5.87	5.75	5.83
1902	18	4	6.41	0.04	6.38	6.41	6.39	6.46
1903	18	4	6.15	0.03	6.19	6.14	6.15	6.12
1904	18	4	6.37	0.08	6.45	6.26	6.36	6.43
1905	18	4	5.75	0.09	5.63	5.74	5.81	5.84
1906	18	4	6.13	0.05	6.08	6.14	6.11	6.19
1901	19	4	5.77	0.04	5.81	5.80	5.72	5.76
1902	19	4	6.39	0.04	6.36	6.39	6.36	6.45
1903	19	4	6.09	0.02	6.11	6.08	6.09	6.08
1904	19	4	6.36	0.08	6.43	6.25	6.37	6.39
1905	19	4	5.73	0.08	5.63	5.69	5.79	5.80
1906	19	4	6.16	0.07	6.07	6.18	6.15	6.22
1901	20	4	5.71	0.04	5.73	5.74	5.67	5.68
1902	20	4	6.52	0.08	6.44	6.52	6.48	6.62
1903	20	4	6.24	0.07	6.33	6.18	6.25	6.20
1904	20	4	6.45	0.08	6.48	6.33	6.47	6.50
1905	20	4	5.83	0.11	5.70	5.78	5.90	5.94
1906	20	4	6.29	0.10	6.16	6.35	6.29	6.38
1901	22	4	5.89	0.09	5.81	5.90	5.84	6.00
1902	22	4	6.54	0.09	6.51	6.44	6.65	6.56
1903	22	4	6.22	0.08	6.30	6.11	6.21	6.27
1904	22	4	6.60	0.08	6.65	6.66	6.61	6.49
1905	22	4	6.03	0.12	5.96	6.21	5.96	5.98
1906	22	4	6.39	0.05	6.39	6.40	6.45	6.32
1901	23	4	5.64	0.04	5.71	5.63	5.62	5.62
1902	23	4	6.29	0.02	6.30	6.28	6.32	6.27
1903	23	4	5.94	0.07	6.02	5.90	5.88	5.97
1904	23	4	6.28	0.10	6.29	6.39	6.29	6.14
1905	23	4	5.68	0.05	5.62	5.65	5.71	5.72
1906	23	4	6.06	0.04	6.01	6.07	6.11	6.04
1901	24	4	5.50	0.11	5.38	5.42	5.62	5.56
1902	24	4	6.17	0.03	6.20	6.14	6.20	6.13
1903	24	4	5.91	0.04	5.91	5.88	5.88	5.97
1904	24	4	6.31	0.09	6.22	6.30	6.29	6.43
1905	24	4	5.63	0.05	5.65	5.69	5.58	5.59
1906	24	4	6.07	0.02	6.08	6.06	6.05	6.09
1901	25	4	5.16	0.12	5.32	5.13	5.14	5.04
1902	25	4	5.77	0.03	5.81	5.79	5.76	5.74
1903	25	4	5.65	0.21	5.43	5.71	5.55	5.91
1904	25	4	5.95	0.13	6.02	6.04	5.99	5.76
1905	25	4	5.46	0.10	5.49	5.41	5.37	5.59
1906	25	4	5.74	0.10	5.65	5.80	5.84	5.65
1901	26	4	5.57	0.05	5.59	5.50	5.58	5.63

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	6.35	0.03	6.32	6.33	6.37	6.38
1903	26	4	6.21	0.04	6.18	6.26	6.21	6.17
1904	26	4	6.23	0.09	6.15	6.28	6.33	6.16
1905	26	4	5.94	0.14	5.92	5.76	6.11	5.95
1906	26	4	6.10	0.32C	5.87	5.78	6.38	6.36
1901	27	4	5.43	0.07	5.50	5.46	5.34	5.41
1902	27	4	6.13	0.07	6.03	6.11	6.21	6.16
1903	27	4	5.92	0.13	5.75	5.89	6.01	6.03
1904	27	4	5.98	0.14	6.01	5.80	5.99	6.13
1905	27	4	5.67	0.15	5.61	5.86	5.72	5.50
1906	27	4	6.14	0.09	6.27	6.04	6.15	6.12
1901	29	4	5.64	0.07	5.71	5.59	5.57	5.69
1902	29	4	6.26	0.12	6.34	6.23	6.09	6.37
1903	29	4	6.13	0.13	6.10	5.98	6.29	6.17
1904	29	4	6.17	0.16	6.39	6.19	6.00	6.11
1905	29	4	5.92	0.20	5.96	5.78	6.19	5.75
1906	29	4	6.31	0.06	6.28	6.37	6.24	6.35
1901	30	4	5.97	0.03	6.01	5.95	5.97	5.96
1902	30	4	6.50	0.03	6.52	6.48	6.47	6.53
1905	30	4	5.75	0.02	5.75	5.79	5.74	5.73
1906	30	4	6.31	0.05	6.39	6.30	6.29	6.27
1901	31	4	5.50	0.11	5.55	5.53	5.57	5.33
1902	31	4	6.30	0.13 c	6.11	6.40	6.38	6.30
1903	31	4	6.00	0.10	5.89	5.96	5.99	6.14
1904	31	4	6.46	0.11	6.59	6.50	6.37	6.37
1905	31	4	5.83	0.17	5.75	5.83	6.07	5.68
1906	31	4	6.14	0.19	6.02	6.43	6.07	6.05
1901	32	4	5.72	0.05	5.76	5.71	5.74	5.65
1902	32	4	6.53	0.03	6.52	6.58	6.51	6.50
1903	32	4	6.14	0.21	6.15	5.99	5.98	6.43
1904	32	4	6.61	0.08	6.50	6.68	6.67	6.61
1905	32	4	5.88	0.11	5.89	5.73	5.94	5.97
1906	32	4	6.29	0.07	6.21	6.37	6.30	6.30
1901	33	0	6.88B	0.17	6.75	7.00		
1902	33	0	7.52B	0.11	7.45	7.68	7.49	7.46
1903	33	0	7.30B	0.10	7.29	7.41	7.33	7.18
1904	33	0	7.56B	0.08	7.51	7.50	7.57	7.67
1905	33	0	7.10B	0.12	7.24	6.96	7.07	7.12
1906	33	0	7.33B	0.19	7.61	7.17	7.24	7.31
1901	34	2	5.13	0.30C	5.35	4.92		
1902	34	2	6.15	0.10	6.08	6.22		
1903	34	2	5.67	0.25 c	5.84	5.49		
1904	34	2	6.14	0.32C	5.92	6.37		
1905	34	2	5.35	0.05	5.39	5.32		
1906	34	2	5.92	0.04	5.95	5.89		
1901	35	4	5.41	0.04	5.42	5.47	5.36	5.39
1902	35	4	6.06	0.05	6.14	6.02	6.04	6.05
1903	35	4	5.74	0.06	5.67	5.71	5.81	5.76
1904	35	4	6.19	0.11	6.10	6.31	6.10	6.25
1905	35	4	5.63	0.05	5.63	5.60	5.59	5.69
1906	35	4	5.74	0.09	5.81	5.67	5.66	5.82
1901	36	4	5.28	0.09	5.39	5.19	5.23	5.33
1902	36	4	5.94	0.06	5.85	5.99	5.95	5.96

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values								
1903	36	4	5.80	0.08	5.81	5.87	5.70	5.82					
1904	36	4	6.14	0.11	6.18	6.24	5.98	6.18					
1905	36	4	5.42	0.15	5.22	5.50	5.39	5.56					
1906	36	4	5.69	0.11	5.60	5.85	5.65	5.67					
1901	37	6	5.13	0.17	4.88	5.09	5.05	5.24	5.36	5.15			
1902	37	6	6.04	0.03	6.00	6.05	6.01	6.04	6.09	6.06			
1903	37	6	5.98	0.16	5.84	6.15	6.07	5.75	5.96	6.12			
1904	37	6	6.17	0.35C	5.89	5.82	6.50	5.88	6.28	6.63			
1905	37	6	5.82	0.22	6.03	5.93	6.03	5.57	5.54	5.85			
1906	37	6	5.63	0.19	5.24	5.75	5.69	5.68	5.69	5.72			
1901	38	4	5.16	0.10	5.28	5.04	5.12	5.19					
1902	38	4	5.92	0.05	5.94	5.94	5.96	5.85					
1903	38	4	5.90	0.09	6.03	5.86	5.89	5.82					
1904	38	4	6.14	0.07	6.14	6.14	6.05	6.23					
1905	38	4	5.60	0.06	5.63	5.65	5.52	5.58					
1906	38	4	6.03	0.22 c	6.14	5.74	5.98	6.25					
1901	39	12	5.30	0.21	5.37	5.17	5.36	5.18	5.28	5.20	5.37	5.09	5.23
1902	39	11	6.01	0.08	6.13	6.09	6.04	6.01	6.03	5.99	5.89	5.89	5.96
1903	39	10	5.53	0.05	5.55	5.65	5.53	5.57	5.52	5.49	5.49	5.49	5.47
1904	39	9	5.90	0.04	5.97	5.94	5.84	5.93	5.89	5.84	5.91	5.89	5.86
1905	39	10	5.06 b	0.06	5.04	5.11	5.07	5.14	4.97	5.10	5.04	5.14	4.98
1906	39	10	5.62	0.04	5.65	5.64	5.59	5.64	5.59	5.62	5.63	5.60	5.57
1901	106	4	5.52	0.06	5.50	5.60	5.45	5.51					
1902	106	4	6.20	0.07	6.22	6.10	6.28	6.22					
1903	106	4	5.94	0.04	5.96	5.91	5.91	5.99					
1904	106	4	6.27	0.05	6.29	6.28	6.21	6.32					
1905	106	4	5.79	0.08	5.72	5.86	5.72	5.85					
1906	106	4	6.15	0.05	6.19	6.11	6.19	6.10					
1901	134	3	5.82	0.10	5.93	5.75	5.76						
1902	134	6	6.40	0.05	6.35	6.42	6.42	6.31	6.45	6.45			
1903	134	4	5.94	0.07	5.91	6.03	5.87	5.95					
1904	134	4	6.38	0.12	6.33	6.25	6.46	6.50					
1905	134	4	5.60	0.07	5.67	5.64	5.55	5.53					
1906	134	4	5.92	0.11	5.94	5.88	6.07	5.81					
1901	139	11	5.19	0.09	5.39	5.14	5.26	5.28	5.17	5.20	5.08	5.21	5.09
1902	139	11	5.91	0.04	5.97	5.94	5.91	5.91	5.84	5.98	5.87	5.87	5.88
1903	139	10	5.46	0.06	5.55	5.46	5.52	5.39	5.50	5.50	5.46	5.43	5.45
1904	139	10	5.82	0.06	5.91	5.83	5.84	5.85	5.76	5.92	5.81	5.78	5.71
1905	139	10	4.98 b	0.09	5.17	4.99	5.00	4.90	5.01	4.95	4.93	4.95	5.02
1906	139	10	5.54	0.04	5.57	5.59	5.59	5.55	5.53	5.55	5.50	5.54	5.54

18.3 Rohfaser / XF

18.3.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	-1.52	-1.58	-1.21	-1.13	-1.52	-1.16
3	-1.11	-0.17	0.34	0.21	0.46	0.02
5	0.39	-0.42	0.02	0.10	-0.46	0.40
6	-0.14	-0.04	-0.14	0.41	-0.22	-0.18
7	0.20	-0.21	0.59	0.41	0.82	0.19
8	0.76	0.11	-0.43	0.63	-0.49	-0.44
9	-0.11	-0.12	0.58	-0.52	0.40	1.56
10	-0.36	-0.31	-0.08	0.04	-0.56	-0.82
14	0.09	-0.40	-1.39	0.11	-0.20	-0.02
15	-0.11	-0.12	0.48	-0.76	-0.49	-0.81
16	-1.30	-1.36	-2.61	-2.30	-1.76	-2.18
17	-0.55	-0.28	-1.15	-1.44	-0.98	-0.91
18	-0.41	-0.38	-0.44	-0.33	0.60	0.06
19	-0.78	-0.56	-0.58	-0.55	0.37	-0.17
20	-1.66	-1.53	-1.68	-1.38	-0.61	-1.02
22	1.62	1.36	1.09	1.89	1.54	1.66
23	0.04	0.12	0.37	-0.07	0.21	-0.66
24	0.14	0.55	-0.01	-0.32	-0.23	-0.39
25	0.49	0.75	0.38	0.29	-0.18	0.22
26	0.66	0.44	-0.03	-0.08	-0.23	0.48
27	0.26	-0.09	0.02	0.51	0.10	-0.76
29	-1.42	-0.59	-0.82	0.19	-1.53	-0.87
30	0.80	0.20			2.43	1.21
31	0.04	-0.16	2.00	0.54	0.18	0.13
32	0.58	0.07	1.35	0.30	0.19	-0.28
33	1.94	2.11	1.09	1.89	1.16	1.96
34	-1.02	-0.33	-0.30	-0.05	-0.02	0.03
35	0.41	0.89	0.56	0.52	0.00	1.23
36	0.03	-0.66	-0.77	-0.37	-0.05	-0.17
37	1.81	-0.52	-0.49	-0.82	-1.52	0.69
38	-0.07	1.49	0.97	0.17	-0.02	-0.65
39	0.02	0.58	1.19	1.05	1.94	0.64
106	0.24	1.45	0.56	1.05	-0.60	1.96
134	-0.20	-0.38	-0.04	-0.58	-0.04	-1.00
139	-0.20	0.06	0.55	0.41	1.31	0.02

18.3.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	23.21	0.32	23.01	23.36	23.62	23.43	22.76	23.06
1902	1	6	16.08	0.20	15.73	16.23	16.17	15.95	16.21	16.19
1903	1	6	17.61	0.73	17.39	16.83	17.19	18.94	17.80	17.49
1904	1	6	18.07	1.23C	18.07	19.89	16.21	17.37	18.49	18.40
1905	1	6	17.98	0.84	16.84	17.32	17.98	18.98	18.88	17.90
1906	1	6	17.66	0.27	17.73	17.30	17.75	17.94	17.90	17.37
1901	3	4	23.62	0.29	23.56	23.54	24.02	23.35		
1902	3	4	17.49	0.23	17.80	17.29	17.36	17.51		
1903	3	4	19.16	0.34	19.47	19.34	19.13	18.69		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	19.41	0.36	19.34	18.92	19.73	19.64
1905	3	4	19.97	0.39	19.48	20.08	20.40	19.91
1906	3	4	18.84	0.21	19.05	18.74	18.58	18.99
1901	5	4	25.11	0.11	25.21	25.20	25.04	25.01
1902	5	4	17.24	0.19	17.26	17.09	17.12	17.50
1903	5	4	18.84	0.31	18.50	18.65	19.12	19.08
1904	5	4	19.30	0.34	18.87	19.29	19.34	19.70
1905	5	4	19.04	0.26	19.01	19.00	19.40	18.77
1906	5	4	19.23	0.23	19.07	19.33	19.01	19.50
1901	6	4	24.59	0.19	24.76	24.71	24.56	24.33
1902	6	4	17.62	0.17	17.71	17.76	17.66	17.37
1903	6	4	18.68	0.29	18.43	18.57	19.09	18.62
1904	6	4	19.61	0.34	19.13	19.61	19.88	19.82
1905	6	4	19.29	0.41	18.68	19.57	19.41	19.48
1906	6	4	18.65	0.26	18.30	18.58	18.86	18.85
1901	7	4	24.93	0.18	24.85	24.79	25.19	24.90
1902	7	4	17.45	0.19	17.58	17.64	17.34	17.26
1903	7	4	19.41	0.30	19.47	19.12	19.25	19.80
1904	7	4	19.61	0.30	20.04	19.60	19.46	19.34
1905	7	4	20.32	0.28	20.15	20.03	20.60	20.51
1906	7	4	19.01	0.08	18.96	19.11	19.05	18.93
1901	8	4	25.48	0.35	25.19	25.84	25.73	25.18
1902	8	4	17.77	0.28	17.92	17.65	18.06	17.43
1903	8	4	18.39	0.18	18.13	18.51	18.49	18.42
1904	8	4	19.83	0.21	19.60	19.77	20.11	19.81
1905	8	4	19.02	0.44	18.93	18.86	18.62	19.65
1906	8	4	18.38	0.34	18.23	18.63	17.98	18.69
1901	9	4	24.62	0.24	24.85	24.40	24.43	24.79
1902	9	4	17.54	0.27	17.71	17.20	17.47	17.80
1903	9	4	19.39	0.37	19.78	19.64	19.10	19.05
1904	9	4	18.68	0.50	17.94	18.98	18.82	18.99
1905	9	4	19.91	0.35	19.51	20.30	19.76	20.07
1906	9	4	20.38	0.17	20.25	20.62	20.38	20.27
1901	10	4	24.37	0.24	24.36	24.51	24.57	24.04
1902	10	4	17.35	0.29	17.45	17.60	17.42	16.93
1903	10	4	18.74	0.25	18.42	19.01	18.81	18.73
1904	10	4	19.24	0.18	19.08	19.29	19.12	19.46
1905	10	4	18.94	0.21	18.93	19.16	19.02	18.66
1906	10	4	18.01	0.42	17.95	18.60	17.62	17.87
1901	14	4	24.82	0.21	25.10	24.73	24.81	24.63
1902	14	4	17.26	0.13	17.09	17.39	17.32	17.25
1903	14	4	17.43	0.95	17.32	16.91	16.67	18.80
1904	14	4	19.31	0.40	19.81	19.27	19.30	18.84
1905	14	4	19.30	0.45	19.32	19.76	18.70	19.44
1906	14	4	18.80	0.08	18.79	18.73	18.91	18.76
1901	15	4	24.62	0.17	24.47	24.53	24.62	24.85
1902	15	4	17.54	0.28	17.76	17.71	17.14	17.54
1903	15	4	19.30	0.38	19.58	18.86	19.10	19.66
1904	15	4	18.44	0.33	18.34	18.82	18.03	18.55
1905	15	4	19.01	0.64	18.94	18.44	18.74	19.92
1906	15	4	18.01	0.23	18.05	18.29	18.00	17.72
1901	16	4	23.42	0.27	23.20	23.42	23.80	23.29
1902	16	4	16.30	0.22	16.19	16.62	16.17	16.22

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	16.21	0.64	15.38	16.07	16.84	16.54
1904	16	4	16.90	0.70	16.83	17.40	17.43	15.92
1905	16	4	17.74	1.12	16.89	18.76	16.65	18.66
1906	16	4	16.65	0.70	15.78	16.36	17.23	17.21
1901	17	4	24.17	0.32	24.43	24.42	23.78	24.06
1902	17	4	17.38	0.22	17.22	17.55	17.58	17.17
1903	17	4	17.67	0.34	17.95	17.43	17.97	17.33
1904	17	4	17.76	0.30	17.97	18.06	17.50	17.51
1905	17	4	18.52	0.09	18.66	18.50	18.47	18.47
1906	17	4	17.92	0.25	18.23	17.62	17.92	17.90
1901	18	4	24.32	0.36	24.39	24.00	24.80	24.09
1902	18	4	17.28	0.13	17.41	17.28	17.34	17.11
1903	18	4	18.38	0.12	18.31	18.36	18.29	18.55
1904	18	4	18.87	0.14	18.75	19.07	18.81	18.86
1905	18	4	20.10	0.60	20.96	19.92	19.94	19.58
1906	18	4	18.89	0.15	19.11	18.85	18.82	18.76
1901	19	4	23.94	0.44	23.95	23.50	24.55	23.79
1902	19	4	17.10	0.19	17.30	17.07	17.17	16.86
1903	19	4	18.24	0.08	18.25	18.24	18.13	18.33
1904	19	4	18.64	0.16	18.43	18.83	18.67	18.65
1905	19	4	19.88	0.68	20.86	19.74	19.61	19.29
1906	19	4	18.66	0.10	18.80	18.65	18.55	18.63
1901	20	4	23.06	0.58	23.31	22.33	23.70	22.93
1902	20	4	16.13	0.28	16.45	16.16	16.16	15.77
1903	20	4	17.14	0.19	16.91	17.36	17.06	17.23
1904	20	4	17.82	0.23	17.48	17.93	17.96	17.91
1905	20	4	18.90	0.67	19.74	19.11	18.48	18.25
1906	20	4	17.81	0.25	18.14	17.81	17.71	17.57
1901	22	4	26.35	0.36	26.77	25.94	26.48	26.21
1902	22	4	19.03	0.41	19.06	19.34	19.27	18.43
1903	22	4	19.91	0.36	19.67	20.19	20.24	19.53
1904	22	4	21.09	0.73	20.33	21.02	22.08	20.93
1905	22	4	21.05	0.39	21.24	20.95	21.45	20.54
1906	22	4	20.48	0.39	20.79	20.12	20.86	20.17
1901	23	4	24.77	0.07	24.73	24.69	24.82	24.83
1902	23	4	17.78	0.29	17.37	17.93	18.03	17.80
1903	23	4	19.19	0.24	18.87	19.30	19.43	19.16
1904	23	4	19.13	0.18	18.93	19.37	19.08	19.14
1905	23	4	19.72	0.66	20.06	20.08	20.00	18.73
1906	23	4	18.17	0.38	18.73	18.09	17.90	17.95
1901	24	4	24.86	0.23	24.63	24.83	25.18	24.82
1902	24	4	18.21	0.14	18.41	18.11	18.12	18.20
1903	24	4	18.81	0.27	19.02	18.50	19.04	18.67
1904	24	4	18.88	0.12	19.04	18.79	18.79	18.90
1905	24	4	19.28	0.04	19.27	19.31	19.23	19.29
1906	24	4	18.44	0.24	18.31	18.19	18.74	18.50
1901	25	4	25.22	0.30	25.02	25.15	25.04	25.66
1902	25	4	18.41	0.20	18.41	18.60	18.14	18.50
1903	25	4	19.20	0.87	20.25	18.91	19.42	18.20
1904	25	4	19.49	1.06	18.43	19.47	19.11	20.93
1905	25	4	19.32	0.45	19.94	19.37	18.93	19.03
1906	25	4	19.05	0.49	19.46	19.20	18.34	19.19
1901	26	4	25.38	0.45	24.77	25.85	25.54	25.37

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	18.10	0.21	17.83	18.33	18.16	18.09
1903	26	4	18.79	0.52	19.35	18.73	18.97	18.12
1904	26	4	19.12	0.55	19.39	19.58	19.15	18.34
1905	26	4	19.27	0.99	18.52	20.72	19.00	18.84
1906	26	4	19.31	1.07	20.17	20.26	18.15	18.65
1901	27	4	24.99	0.23	24.73	24.87	25.12	25.23
1902	27	4	17.57	0.29	17.68	17.19	17.88	17.52
1903	27	4	18.84	0.30	19.15	18.60	19.04	18.57
1904	27	4	19.71	0.36	19.19	19.74	19.89	20.02
1905	27	4	19.60	1.08	18.44	18.92	20.55	20.50
1906	27	4	18.07	0.52	17.76	17.55	18.23	18.73
1901	29	4	23.31	0.10	23.38	23.17	23.31	23.39
1902	29	4	17.07	0.26	17.36	17.14	17.08	16.72
1903	29	4	17.99	0.39	17.60	18.40	17.73	18.24
1904	29	4	19.39	0.93	18.48	18.97	19.46	20.63
1905	29	4	17.97	1.05	16.96	19.05	17.20	18.69
1906	29	4	17.95	0.79	17.08	18.23	17.58	18.91
1901	30	4	25.53	0.11	25.63	25.39	25.59	25.51
1902	30	4	17.86	0.21	17.86	17.91	17.59	18.09
1905	30	4	21.93	0.27	22.24	21.63	21.81	22.04
1906	30	4	20.03	0.18	20.02	19.82	20.25	20.05
1901	31	4	24.77	0.89	24.84	23.50	25.23	25.52
1902	31	4	17.50	0.87C	18.20	16.25	17.55	17.99
1903	31	4	20.81	0.81	20.31	21.37	21.62	19.95
1904	31	4	19.74	0.42	20.08	19.69	19.17	20.02
1905	31	4	19.69	1.76C	21.06	20.37	17.11	20.20
1906	31	4	18.95	1.11	20.16	17.52	18.79	19.35
1901	32	4	25.31	0.31	25.29	25.01	25.19	25.74
1902	32	4	17.73	0.41	18.19	17.27	17.52	17.93
1903	32	4	20.16	0.74	19.90	21.00	20.47	19.29
1904	32	4	19.50	0.05	19.54	19.44	19.53	19.48
1905	32	4	19.69	0.62	20.38	19.42	18.98	19.99
1906	32	4	18.54	0.61	19.36	18.30	17.94	18.55
1901	33	2	26.67	0.07	26.72	26.62		
1902	33	4	19.77	0.07	19.73	19.87	19.73	19.74
1903	33	4	19.90	1.00	21.18	18.75	19.74	19.94
1904	33	4	21.09	0.27	21.11	21.35	21.19	20.72
1905	33	4	20.67	0.50	20.12	21.17	21.01	20.36
1906	33	4	20.79	0.79	19.80	21.36	20.51	21.48
1901	34	2	23.70	0.96 c	23.03	24.38		
1902	34	2	17.33	0.23	17.17	17.49		
1903	34	2	18.52	1.53C	19.61	17.44		
1904	34	2	19.15	0.92	18.50	19.80		
1905	34	2	19.48	0.26	19.67	19.30		
1906	34	2	18.85	0.76	18.32	19.39		
1901	35	4	25.14	0.48	24.54	25.66	25.35	25.02
1902	35	4	18.55	0.32	18.79	18.18	18.86	18.38
1903	35	4	19.37	0.47	19.87	19.20	18.80	19.63
1904	35	4	19.72	0.20	19.84	19.48	19.92	19.65
1905	35	4	19.51	0.33	19.34	19.78	19.79	19.12
1906	35	4	20.06	0.38	20.31	19.52	20.02	20.36
1901	36	4	24.75	0.38	25.04	24.49	25.11	24.38
1902	36	4	17.00	0.09	16.93	17.11	16.93	17.04

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	18.05	0.40	17.97	17.52	18.39	18.31				
1904	36	4	18.82	0.45	19.27	18.29	19.11	18.62				
1905	36	4	19.46	0.55	20.19	19.20	19.52	18.91				
1906	36	4	18.66	0.59	19.08	18.32	19.23	18.00				
1901	37	6	26.54	0.84	27.74	26.49	26.67	27.13	25.57	25.64		
1902	37	6	17.14	0.15	17.40	17.02	17.16	17.15	16.95	17.15		
1903	37	6	18.32	0.59	19.29	17.85	17.87	18.80	18.00	18.13		
1904	37	6	18.38	1.42C	19.41	20.40	17.14	18.99	17.24	17.09		
1905	37	6	17.99	1.27	16.82	18.35	16.08	19.08	19.25	18.34		
1906	37	6	19.51	1.12 c	21.76	19.16	19.08	19.32	18.83	18.90		
1901	38	4	24.66	0.38	24.63	25.15	24.21	24.65				
1902	38	4	19.15	0.38	19.68	18.87	18.89	19.15				
1903	38	4	19.79	0.46	19.27	19.89	19.65	20.36				
1904	38	4	19.37	0.66	20.25	18.68	19.16	19.41				
1905	38	4	19.48	0.22	19.26	19.37	19.52	19.77				
1906	38	4	18.17	1.50C	18.60	19.02	15.95	19.13				
1901	39	11	25.17	0.29	24.72	25.20	24.74	25.60	25.16	25.48	25.09	25.38
1902	39	11	18.24	0.15	18.29	18.11	18.20	17.99	18.39	18.28	18.12	18.11
1903	39	10	20.00	0.19	20.21	19.62	20.04	19.86	20.24	19.88	20.01	20.06
1904	39	9	20.25	0.19	20.31	19.95	20.35	20.20	20.55	20.38	20.02	20.36
1905	39	10	21.44	0.33	21.63	21.05	21.56	21.03	21.67	21.21	21.86	21.22
1906	39	10	19.47	0.17	19.24	19.29	19.78	19.41	19.60	19.48	19.53	19.42
1901	106	4	24.96	0.73	23.99	24.86	25.66	25.33				
1902	106	4	19.11	0.25	19.42	19.06	19.16	18.81				
1903	106	4	19.37	0.59	18.82	18.95	19.65	20.07				
1904	106	4	20.25	0.40	20.08	20.79	20.27	19.87				
1905	106	4	18.90	0.68	18.80	18.43	18.48	19.90				
1906	106	4	20.78	0.14	20.62	20.73	20.82	20.96				
1901	134	3	24.53	0.21	24.74	24.51	24.33					
1902	134	6	17.28	0.28	17.58	17.45	17.43	16.82	17.28	17.10		
1903	134	4	18.77	0.38	18.77	18.76	19.25	18.33				
1904	134	4	18.62	0.32	18.52	18.92	18.21	18.83				
1905	134	4	19.46	0.56	19.34	19.46	20.21	18.85				
1906	134	4	17.82	0.37	17.48	17.61	17.89	18.31				
1901	139	11	24.53	0.28	23.98	24.57	24.29	24.35	24.78	24.36	24.84	24.51
1902	139	11	17.72	0.15	17.37	17.76	17.70	17.86	17.83	17.61	17.87	17.73
1903	139	10	19.37	0.18	19.02	19.44	19.34	19.20	19.28	19.46	19.56	19.57
1904	139	10	19.61	0.13	19.53	19.75	19.57	19.41	19.65	19.76	19.50	19.52
1905	139	10	20.82	0.33	20.45	21.14	20.46	21.01	20.64	21.02	20.59	21.14
1906	139	10	18.84	0.15	18.59	18.95	18.88	18.65	18.93	18.77	18.98	18.87

18.4 Rohfett / XL

18.4.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	-0.14	-0.21	-0.35	-0.17	-0.23	-0.14
3	-0.33	0.75	0.88	0.97	0.73	1.05
5	-0.16	-0.09	-0.15	-0.02	-0.15	-0.33
6	0.15	0.21	0.46	0.21	0.26	0.65
7	0.16	-0.11	-0.40	-0.04	-0.71	0.19
8	0.49	0.91	1.78	1.40	1.68	1.47
9	0.50	0.65	0.28	-0.41	-0.19	-0.51
10	-0.07	-0.04	-0.15	-0.34	-0.07	0.09
14	-0.13	-0.51	-0.39	-0.18	-0.14	-0.06
15	0.41	-0.04	-0.50	0.02	0.20	0.33
16	-0.54	-0.78	-1.01	-0.61	-1.03	-0.49
17	0.25	0.10	0.22	0.69	0.44	0.87
18	0.00	-0.22	0.19	0.04	0.08	-0.49
19	-0.16	-0.43	-0.06	-0.07	-0.07	-0.63
20	-0.31	-0.62	-0.10	-0.16	-0.04	-0.66
22	1.08	1.59	1.22	1.30	1.18	1.48
23	-0.11	-0.21	-0.30	-0.16	-0.38	-0.29
24	-0.16	-0.20	-0.18	-0.16	-0.60	-0.08
25	0.16	0.07	0.11	0.38	-0.16	-0.01
26	-0.56	-0.47	-0.23	-0.76	0.21	-0.19
27	0.02	-0.05	-0.17	0.09	-0.01	0.36
29	-0.76	-0.27	0.31	-0.25	-0.26	-0.19
30	0.78	1.58			0.98	1.52
31	0.21	0.15	0.17	0.29	0.73	0.32
32	0.14	0.85	1.14	1.03	1.18	1.12
33	-2.02	-1.75	-1.24	-1.48	-1.38	-1.39
34	0.28	-0.08	0.09	-0.04	-0.12	-0.26
35	-0.25	-0.64	-0.43	-0.56	-0.27	-0.95
36	0.27	0.71	0.79	0.81	0.88	0.28
37	-0.61	-0.46	-1.13	-1.07	-1.03	-1.47
38	-0.01	-0.50	-0.48	-0.22	-0.37	-0.10
39	-0.39	-0.20	-0.14	-0.13	-0.37	-0.38
106	-0.62	-0.41	-0.81	-0.76	-0.89	-0.65
134	1.12	1.28	0.96	0.77	0.45	0.23
139	-0.73	-0.56	-0.36	-0.42	-0.58	-0.69

18.4.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	2.16	0.05	2.11	2.15	2.20	2.15	2.14	2.25
1902	1	6	2.89	0.04	2.91	2.86	2.94	2.85	2.86	2.90
1903	1	6	2.42	0.06	2.49	2.43	2.38	2.39	2.49	2.35
1904	1	6	2.42	0.05	2.44	2.37	2.40	2.37	2.48	2.47
1905	1	6	2.31	0.09	2.38	2.23	2.23	2.37	2.42	2.21
1906	1	6	2.71	0.03	2.72	2.66	2.72	2.68	2.73	2.73
1901	3	4	2.11	0.04	2.16	2.12	2.06	2.09		
1902	3	4	3.18	0.08	3.06	3.17	3.22	3.25		
1903	3	4	2.79	0.11	2.76	2.91	2.65	2.84		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	2.76	0.10	2.76	2.68	2.70	2.91
1905	3	4	2.60	0.07	2.67	2.50	2.63	2.58
1906	3	4	3.07	0.14	2.90	3.24	3.02	3.12
1901	5	4	2.16	0.04	2.15	2.21	2.12	2.16
1902	5	4	2.92	0.04	2.88	2.96	2.94	2.92
1903	5	4	2.48	0.05	2.49	2.53	2.40	2.49
1904	5	4	2.47	0.07	2.56	2.44	2.49	2.38
1905	5	4	2.33	0.09	2.35	2.23	2.31	2.44
1906	5	4	2.65	0.06	2.70	2.60	2.71	2.60
1901	6	4	2.25	0.03	2.27	2.21	2.26	2.27
1902	6	4	3.01	0.04	2.98	2.98	3.06	3.04
1903	6	4	2.66	0.03	2.65	2.62	2.69	2.69
1904	6	4	2.54	0.04	2.49	2.59	2.56	2.51
1905	6	4	2.46	0.06	2.46	2.37	2.50	2.49
1906	6	4	2.95	0.08	2.97	3.06	2.88	2.88
1901	7	4	2.25	0.17	2.30	2.35	2.00	2.37
1902	7	4	2.92	0.17	2.86	2.73	3.14	2.94
1903	7	4	2.40	0.17	2.40	2.63	2.23	2.35
1904	7	4	2.46	0.07	2.38	2.42	2.50	2.54
1905	7	4	2.16	0.09	2.10	2.07	2.23	2.25
1906	7	4	2.81	0.11	2.82	2.87	2.65	2.88
1901	8	4	2.35	0.05	2.33	2.40	2.38	2.30
1902	8	4	3.22	0.07	3.14	3.29	3.26	3.19
1903	8	4	3.06	0.18	3.30	2.98	2.86	3.09
1904	8	4	2.89	0.09	2.78	3.00	2.87	2.93
1905	8	4	2.88	0.09	2.96	2.94	2.75	2.87
1906	8	4	3.19	0.12	3.31	3.14	3.28	3.05
1901	9	4	2.36	0.05	2.39	2.39	2.36	2.29
1902	9	4	3.14	0.10	3.13	3.28	3.15	3.03
1903	9	4	2.61	0.06	2.64	2.67	2.54	2.58
1904	9	4	2.35	0.07	2.35	2.44	2.32	2.29
1905	9	4	2.32	0.04	2.31	2.38	2.29	2.31
1906	9	4	2.60	0.10	2.71	2.65	2.52	2.51
1901	10	4	2.18	0.05	2.17	2.16	2.15	2.25
1902	10	4	2.94	0.02	2.93	2.97	2.92	2.93
1903	10	4	2.48	0.04	2.46	2.47	2.45	2.54
1904	10	4	2.37	0.03	2.41	2.33	2.38	2.36
1905	10	4	2.36	0.04	2.35	2.32	2.34	2.41
1906	10	4	2.78	0.07	2.81	2.69	2.86	2.75
1901	14	4	2.17	0.02	2.16	2.20	2.16	2.15
1902	14	4	2.80	0.02	2.79	2.82	2.80	2.78
1903	14	4	2.41	0.05	2.37	2.40	2.39	2.48
1904	14	4	2.42	0.05	2.43	2.47	2.35	2.42
1905	14	4	2.33	0.06	2.25	2.36	2.36	2.36
1906	14	4	2.73	0.03	2.77	2.71	2.73	2.73
1901	15	4	2.33	0.10	2.22	2.35	2.46	2.28
1902	15	4	2.94	0.05	2.88	2.92	2.95	3.01
1903	15	4	2.37	0.04	2.38	2.39	2.32	2.41
1904	15	4	2.48	0.13	2.35	2.53	2.64	2.39
1905	15	4	2.44	0.12	2.56	2.51	2.38	2.29
1906	15	4	2.85	0.02	2.85	2.84	2.88	2.83
1901	16	4	2.04	0.04	2.01	2.11	2.03	2.02
1902	16	4	2.72	0.01	2.72	2.71	2.73	2.71

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	2.22	0.05	2.26	2.15	2.23	2.25
1904	16	4	2.29	0.07	2.21	2.38	2.29	2.29
1905	16	4	2.07	0.13	2.19	2.14	1.90	2.04
1906	16	4	2.60	0.08	2.61	2.55	2.54	2.71
1901	17	4	2.28	0.11	2.38	2.15	2.37	2.22
1902	17	4	2.98	0.09	2.96	2.90	2.95	3.11
1903	17	4	2.59	0.08	2.65	2.67	2.50	2.55
1904	17	4	2.68	0.08	2.58	2.65	2.72	2.76
1905	17	4	2.51	0.06	2.60	2.51	2.46	2.47
1906	17	4	3.01	0.04	3.02	2.96	3.04	3.03
1901	18	4	2.21	0.02	2.22	2.20	2.18	2.23
1902	18	4	2.88	0.01	2.86	2.90	2.88	2.89
1903	18	4	2.58	0.01	2.59	2.59	2.57	2.59
1904	18	4	2.49	0.02	2.51	2.48	2.47	2.48
1905	18	4	2.40	0.04	2.37	2.42	2.37	2.44
1906	18	4	2.60	0.07	2.69	2.63	2.56	2.54
1901	19	4	2.16	0.02	2.16	2.16	2.14	2.18
1902	19	4	2.82	0.02	2.80	2.81	2.83	2.84
1903	19	4	2.51	0.01	2.51	2.50	2.52	2.50
1904	19	4	2.45	0.04	2.49	2.46	2.45	2.40
1905	19	4	2.36	0.03	2.33	2.38	2.33	2.39
1906	19	4	2.56	0.05	2.62	2.58	2.54	2.51
1901	20	4	2.11	0.02	2.09	2.13	2.11	2.13
1902	20	4	2.76	0.02	2.74	2.77	2.78	2.77
1903	20	4	2.50	0.00	2.50	2.50	2.49	2.49
1904	20	4	2.43	0.01	2.41	2.44	2.43	2.42
1905	20	4	2.36	0.03	2.35	2.36	2.34	2.40
1906	20	4	2.55	0.06	2.58	2.61	2.52	2.49
1901	22	4	2.53	0.11	2.38	2.62	2.56	2.56
1902	22	4	3.43	0.02	3.42	3.41	3.42	3.45
1903	22	4	2.89	0.11	2.91	2.76	2.87	3.02
1904	22	4	2.86	0.07	2.83	2.92	2.92	2.78
1905	22	4	2.73	0.06	2.74	2.72	2.80	2.66
1906	22	4	3.19	0.09	3.21	3.13	3.12	3.31
1901	23	4	2.17	0.02	2.19	2.18	2.18	2.15
1902	23	4	2.89	0.01	2.89	2.90	2.88	2.89
1903	23	4	2.44	0.07	2.49	2.47	2.34	2.44
1904	23	4	2.42	0.02	2.45	2.44	2.41	2.40
1905	23	4	2.26	0.03	2.27	2.26	2.29	2.23
1906	23	4	2.66	0.04	2.61	2.68	2.68	2.68
1901	24	4	2.16	0.08	2.19	2.13	2.07	2.25
1902	24	4	2.89	0.08	2.79	2.97	2.89	2.91
1903	24	4	2.47	0.04	2.48	2.45	2.44	2.52
1904	24	4	2.43	0.03	2.45	2.38	2.42	2.45
1905	24	4	2.20	0.09	2.11	2.20	2.16	2.31
1906	24	4	2.73	0.04	2.67	2.73	2.74	2.77
1901	25	4	2.25	0.05	2.22	2.32	2.23	2.24
1902	25	4	2.97	0.03	2.94	2.98	2.96	3.00
1903	25	4	2.56	0.06	2.48	2.55	2.57	2.63
1904	25	4	2.59	0.07	2.51	2.60	2.67	2.56
1905	25	4	2.33	0.07	2.40	2.37	2.30	2.24
1906	25	4	2.75	0.11	2.83	2.82	2.75	2.59
1901	26	4	2.04	0.20C	1.99	1.89	1.93	2.34

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	2.81	0.17C	2.80	2.59	2.84	3.01
1903	26	4	2.46	0.10	2.44	2.53	2.54	2.32
1904	26	4	2.25	0.20	2.33	2.16	2.48	2.01
1905	26	4	2.44	0.10	2.32	2.40	2.50	2.54
1906	26	4	2.69	0.18 c	2.49	2.62	2.76	2.91
1901	27	4	2.21	0.05	2.23	2.25	2.23	2.15
1902	27	4	2.93	0.07	2.95	3.00	2.83	2.95
1903	27	4	2.47	0.07	2.53	2.52	2.38	2.47
1904	27	4	2.50	0.10	2.52	2.48	2.38	2.61
1905	27	4	2.37	0.15	2.42	2.54	2.36	2.17
1906	27	4	2.86	0.11	2.94	2.78	2.96	2.75
1901	29	4	1.98	0.13	2.15	1.96	1.84	1.97
1902	29	4	2.87	0.03	2.91	2.88	2.83	2.84
1903	29	4	2.62	0.05	2.63	2.58	2.69	2.58
1904	29	4	2.40	0.17	2.62	2.28	2.43	2.26
1905	29	4	2.30	0.13	2.33	2.12	2.32	2.43
1906	29	4	2.69	0.08	2.63	2.67	2.81	2.66
1901	30	4	2.44	0.03	2.43	2.46	2.40	2.47
1902	30	4	3.42	0.04	3.47	3.41	3.44	3.37
1905	30	4	2.67	0.03	2.69	2.66	2.70	2.64
1906	30	4	3.21	0.07	3.27	3.23	3.21	3.12
1901	31	4	2.27	0.19	2.24	2.54	2.16	2.13
1902	31	4	2.99	0.20C	2.91	3.28	2.94	2.84
1903	31	4	2.58	0.19 c	2.58	2.45	2.84	2.43
1904	31	4	2.56	0.12	2.63	2.50	2.69	2.42
1905	31	4	2.60	0.30C	2.44	2.40	3.03	2.51
1906	31	4	2.85	0.29C	2.76	3.25	2.80	2.57
1901	32	4	2.25	0.09	2.26	2.37	2.21	2.16
1902	32	4	3.20	0.08	3.28	3.24	3.10	3.21
1903	32	4	2.87	0.06	2.88	2.84	2.80	2.94
1904	32	4	2.78	0.08	2.90	2.78	2.75	2.70
1905	32	4	2.73	0.12	2.73	2.57	2.84	2.79
1906	32	4	3.09	0.07	3.03	3.19	3.09	3.04
1901	33	0	1.60B	0.11	1.52	1.68		
1902	33	4	2.42	0.08	2.32	2.42	2.52	2.45
1903	33	4	2.15	0.03	2.18	2.11	2.17	2.15
1904	33	4	2.03	0.16	2.10	2.22	1.93	1.87
1905	33	4	1.96	0.11	2.12	1.89	1.94	1.90
1906	33	4	2.33	0.05	2.27	2.33	2.39	2.33
1901	34	2	2.29	0.10	2.36	2.22		
1902	34	2	2.93	0.06	2.97	2.88		
1903	34	2	2.55	0.04	2.52	2.58		
1904	34	2	2.46	0.19	2.33	2.59		
1905	34	2	2.34	0.15	2.24	2.44		
1906	34	2	2.67	0.14	2.77	2.57		
1901	35	4	2.13	0.04	2.18	2.11	2.15	2.08
1902	35	4	2.76	0.12	2.63	2.81	2.69	2.90
1903	35	4	2.40	0.06	2.36	2.36	2.48	2.38
1904	35	4	2.31	0.01	2.31	2.29	2.31	2.31
1905	35	4	2.30	0.03	2.26	2.29	2.33	2.30
1906	35	4	2.47	0.03	2.49	2.49	2.45	2.44
1901	36	4	2.29	0.05	2.33	2.27	2.23	2.33
1902	36	4	3.16	0.04	3.15	3.13	3.16	3.22

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values								
1903	36	4	2.76	0.10	2.87	2.67	2.69	2.82					
1904	36	4	2.71	0.10	2.84	2.63	2.66	2.73					
1905	36	4	2.64	0.10	2.52	2.72	2.59	2.73					
1906	36	4	2.83	0.06	2.79	2.91	2.78	2.86					
1901	37	6	2.02	0.08	1.89	2.10	1.99	2.06	2.00	2.11			
1902	37	6	2.81	0.04	2.79	2.87	2.81	2.77	2.79	2.83			
1903	37	6	2.19	0.09	2.16	2.19	2.19	2.10	2.12	2.37			
1904	37	6	2.15	0.13	1.94	2.14	2.20	2.22	2.10	2.31			
1905	37	6	2.07	0.07	1.98	2.05	2.20	2.08	2.05	2.05			
1906	37	6	2.31	0.06	2.32	2.39	2.29	2.24	2.35	2.26			
1901	38	4	2.20	0.04	2.16	2.24	2.23	2.18					
1902	38	4	2.80	0.05	2.83	2.79	2.85	2.73					
1903	38	4	2.38	0.02	2.40	2.37	2.40	2.36					
1904	38	4	2.41	0.10	2.27	2.48	2.50	2.39					
1905	38	4	2.27	0.04	2.32	2.25	2.27	2.23					
1906	38	4	2.72	0.06	2.69	2.66	2.81	2.72					
1901	39	12	2.09	0.11	2.08	2.11	2.09	2.04	2.05	1.99	2.07	2.03	2.02
1902	39	11	2.89	0.04	2.93	2.95	2.91	2.93	2.91	2.88	2.86	2.85	2.85
1903	39	10	2.48	0.04	2.55	2.50	2.52	2.52	2.50	2.44	2.46	2.46	2.46
1904	39	9	2.43	0.03	2.49	2.40	2.47	2.39	2.46	2.42	2.40	2.45	2.43
1905	39	10	2.27	0.03	2.27	2.29	2.25	2.28	2.21	2.26	2.23	2.31	2.28
1906	39	10	2.64	0.04	2.64	2.69	2.64	2.67	2.63	2.65	2.62	2.62	2.55
1901	106	4	2.02	0.07	1.94	2.08	1.98	2.07					
1902	106	4	2.83	0.06	2.73	2.87	2.85	2.85					
1903	106	4	2.28	0.08	2.22	2.40	2.26	2.25					
1904	106	4	2.25	0.05	2.20	2.31	2.21	2.26					
1905	106	4	2.11	0.06	2.08	2.15	2.17	2.05					
1906	106	4	2.55	0.03	2.58	2.53	2.53	2.57					
1901	134	3	2.54	0.08	2.46	2.62	2.54						
1902	134	6	3.33	0.04	3.28	3.37	3.31	3.39	3.34	3.30			
1903	134	4	2.81	0.08	2.87	2.90	2.72	2.77					
1904	134	4	2.71	0.16	2.58	2.55	2.88	2.81					
1905	134	4	2.51	0.07	2.47	2.50	2.46	2.62					
1906	134	4	2.82	0.03	2.83	2.77	2.84	2.85					
1901	139	11	1.99	0.04	2.04	2.01	1.98	2.00	2.00	2.04	1.92	2.01	1.92
1902	139	11	2.78	0.05	2.89	2.78	2.79	2.78	2.81	2.81	2.74	2.74	2.76
1903	139	10	2.42	0.05	2.48	2.49	2.38	2.45	2.37	2.45	2.33	2.44	2.37
1904	139	10	2.35	0.05	2.36	2.37	2.28	2.43	2.29	2.36	2.31	2.39	2.32
1905	139	10	2.20	0.03	2.25	2.20	2.21	2.21	2.21	2.18	2.23	2.22	2.20
1906	139	10	2.54	0.03	2.59	2.52	2.59	2.53	2.57	2.53	2.58	2.50	2.51

18.5 Stärke / XS

18.5.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	1.36	1.02	0.79	0.86	1.11	0.76
3	2.97	1.45	0.96	0.94	0.85	1.30
5	-0.55	0.21	-0.02	-0.29	0.46	-0.55
6	0.26	0.15	0.05	-0.35	0.15	0.03
7	0.21	0.43	-0.02	-0.02	-0.39	0.11
8	-0.61	-0.03	0.26	-1.02	0.05	0.01
9	0.41	0.42	-0.13	1.74	0.50	-0.32
10	0.55	0.40	0.24	0.27	0.75	0.95
14	0.20	0.77	2.09	0.44	0.55	0.36
15	0.13	0.07	0.04	1.16	1.02	1.28
16	1.12	0.99	2.57	2.10	1.71	2.00
17	0.21	-0.00	0.36	0.38	0.00	-0.77
18	0.41	0.33	0.05	-0.00	-0.84	-0.36
19	0.42	0.23	-0.06	0.02	-0.87	-0.43
20	1.27	0.99	0.79	0.67	-0.12	0.27
22	-2.00	-1.79	-0.78	-1.93	-1.04	-1.27
23	-0.00	-0.15	-0.59	-0.34	-0.58	0.30
24	0.03	-0.34	-0.04	0.25	0.39	0.28
25	-0.03	-0.45	0.10	0.14	0.92	0.51
26	-0.89	-0.37	-0.39	0.04	0.07	-0.52
27	-0.22	0.11	0.15	-0.27	0.10	1.03
29	2.10	0.90	1.07	0.98	2.06	1.28
30	-1.98	-1.56			-3.12	-2.46
31	0.44	0.35	-1.09	0.05	0.23	0.31
32	0.04	0.04	-0.78	-0.18	0.08	0.35
33	-3.25	-3.32	-1.93	-2.28	-1.73	-2.24
34	0.77	0.42	0.33	0.66	0.36	1.01
35	-0.57	-0.70	-0.82	-0.91	-0.31	-1.42
36	-0.45	0.01	-0.20	-0.85	-0.87	-0.87
37	-1.27	0.61	1.35	1.86	2.56	0.81
38	0.20	-1.52	-0.83	-0.61	-0.58	0.15
39	0.18	-0.66	-1.16	-0.95	-1.49	-0.36
106	0.36	-0.57	-0.29	-0.80	0.50	-1.40
134	-1.77	-1.69	-1.54	-1.40	-1.60	-0.44
139	0.36	-0.08	-0.52	-0.34	-0.91	0.31

18.5.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	25.40	0.64	26.25	25.12	24.58	25.25	26.08	25.11
1902	1	6	35.72	0.34	36.24	35.76	35.56	35.97	35.41	35.36
1903	1	6	38.20	1.20	38.17	39.54	39.24	36.34	37.33	38.55
1904	1	6	35.45	2.22	35.37	32.97	39.14	36.77	34.07	34.36
1905	1	6	36.98	1.58	38.97	38.33	37.16	35.29	35.05	37.06
1906	1	6	34.11	0.67	34.20	35.05	33.61	33.73	33.35	34.73
1901	3	4	28.63	0.36	28.50	28.97	28.19	28.87		
1902	3	4	36.58	0.31	36.27	36.65	36.98	36.41		
1903	3	4	38.54	0.69	38.25	37.95	38.42	39.54		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	35.60	1.49	36.54	37.20	34.40	34.27
1905	3	4	36.46	0.65	37.14	36.71	35.59	36.39
1906	3	4	35.17	0.84	34.97	35.69	35.96	34.07
1901	5	4	21.59	0.15	21.41	21.77	21.61	21.55
1902	5	4	34.09	0.26	34.01	34.25	34.34	33.77
1903	5	4	36.58	0.36	37.02	36.71	36.30	36.29
1904	5	4	33.14	0.58	33.79	33.44	32.81	32.52
1905	5	4	35.67	0.34	36.02	35.63	35.23	35.81
1906	5	4	31.48	0.31	31.57	31.50	31.79	31.06
1901	6	4	23.20	0.35	22.89	23.06	23.16	23.70
1902	6	4	33.98	0.35	34.01	33.76	33.69	34.46
1903	6	4	36.71	0.64	37.33	37.09	35.90	36.53
1904	6	4	33.01	0.76	34.11	32.91	32.38	32.65
1905	6	4	35.06	0.83	36.28	34.87	34.58	34.50
1906	6	4	32.65	0.56	33.21	33.04	32.23	32.12
1901	7	4	23.12	0.32	22.88	22.94	23.58	23.07
1902	7	4	34.53	0.32	34.24	34.30	34.66	34.92
1903	7	4	36.58	0.23	36.78	36.59	36.70	36.27
1904	7	4	33.68	0.59	33.06	33.93	33.37	34.38
1905	7	4	33.97	0.49	34.69	33.67	33.69	33.82
1906	7	4	32.80	0.48	33.41	32.40	32.45	32.97
1901	8	4	21.47	0.54	21.82	20.80	21.25	21.99
1902	8	4	33.62	0.28	33.37	33.89	33.38	33.84
1903	8	4	37.13	0.30	36.79	37.41	37.35	36.98
1904	8	4	31.68	0.39	32.13	31.84	31.56	31.21
1905	8	4	34.84	0.62	34.68	35.11	35.52	34.06
1906	8	4	32.59	0.45	32.13	32.30	32.83	33.11
1901	9	4	23.52	0.50	23.25	23.97	23.90	22.95
1902	9	4	34.52	0.37	34.06	34.84	34.79	34.40
1903	9	4	36.35	1.07	35.17	35.72	37.33	37.18
1904	9	4	37.20	1.29	39.01	36.27	37.22	36.29
1905	9	4	35.76	1.07	36.84	34.59	36.48	35.12
1906	9	4	31.94	0.33	31.99	31.46	32.13	32.19
1901	10	4	23.79	0.37	23.82	23.53	23.50	24.31
1902	10	4	34.48	0.31	34.38	34.17	34.47	34.91
1903	10	4	37.10	0.38	37.55	36.66	37.22	36.96
1904	10	4	34.26	0.40	34.84	33.98	34.20	34.04
1905	10	4	36.25	0.24	35.93	36.24	36.33	36.51
1906	10	4	34.48	0.84	34.30	33.37	35.21	35.03
1901	14	4	23.08	0.33	22.63	23.21	23.08	23.41
1902	14	4	35.21	0.30	35.65	34.98	35.03	35.18
1903	14	4	40.79 b	2.12 c	41.04	42.10	42.29	37.72
1904	14	4	34.60	1.09	32.98	34.87	35.21	35.32
1905	14	4	35.85	0.89	36.46	34.90	36.74	35.28
1906	14	4	33.30	0.27	33.01	33.42	33.16	33.62
1901	15	4	22.96	0.36	23.12	22.86	23.34	22.50
1902	15	4	33.82	0.36	33.64	33.41	34.15	34.08
1903	15	4	36.69	0.70	36.05	37.45	37.12	36.14
1904	15	4	36.03	0.71	36.97	35.24	36.03	35.89
1905	15	4	36.80	1.16	36.51	37.97	37.39	35.32
1906	15	4	35.14	0.29	34.96	34.87	35.20	35.51
1901	16	4	24.94	0.56	25.50	24.79	24.21	25.25
1902	16	4	35.66	0.43	36.02	35.04	35.85	35.72

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	41.75 b	1.31	43.10	42.38	40.06	41.48
1904	16	4	37.93	1.43	37.59	37.00	37.09	40.04
1905	16	4	38.17	2.42	38.91	36.11	41.27	36.38
1906	16	4	36.58	1.39	38.09	37.40	35.68	35.16
1901	17	4	23.10	0.50	22.37	23.22	23.30	23.52
1902	17	4	33.68	0.35	34.18	33.59	33.38	33.57
1903	17	4	37.33	0.54	36.62	37.68	37.21	37.82
1904	17	4	34.47	0.36	34.65	33.96	34.77	34.51
1905	17	4	34.76	0.34	34.34	34.64	34.99	35.09
1906	17	4	31.04	0.77	30.29	32.12	30.83	30.92
1901	18	4	23.52	0.66	23.41	24.25	22.66	23.74
1902	18	4	34.34	0.09	34.26	34.43	34.26	34.41
1903	18	4	36.71	0.22	36.62	36.91	36.85	36.43
1904	18	4	33.72	0.15	33.93	33.64	33.71	33.58
1905	18	4	33.08	1.12	31.47	33.23	33.66	33.97
1906	18	4	31.87	0.51	31.48	31.41	32.09	32.48
1901	19	4	23.54	0.71	23.39	24.34	22.65	23.76
1902	19	4	34.14	0.14	33.98	34.26	34.06	34.25
1903	19	4	36.48	0.21	36.30	36.73	36.59	36.32
1904	19	4	33.76	0.21	34.05	33.77	33.69	33.55
1905	19	4	33.02	1.16	31.37	33.10	33.58	34.03
1906	19	4	31.72	0.45	31.35	31.32	32.09	32.13
1901	20	4	25.23	0.99	24.72	26.50	24.23	25.47
1902	20	4	35.67	0.22	35.40	35.69	35.64	35.94
1903	20	4	38.20	0.22	38.50	38.03	38.24	38.04
1904	20	4	35.06	0.41	35.52	35.20	34.96	34.54
1905	20	4	34.51	1.10	33.09	34.23	35.24	35.49
1906	20	4	33.11	0.80	32.53	32.38	33.50	34.04
1901	22	4	18.69	0.35	18.19	18.78	18.83	18.97
1902	22	4	30.09	0.70	29.72	29.96	29.58	31.12
1903	22	4	35.05	0.29	35.47	34.96	34.78	34.98
1904	22	4	29.87	1.45	31.35	29.63	27.96	30.52
1905	22	4	32.67	0.50	32.09	32.90	32.44	33.22
1906	22	4	30.04	0.67	29.38	30.84	29.59	30.32
1901	23	4	22.68	0.17	22.75	22.48	22.63	22.88
1902	23	4	33.37	0.64	34.22	33.06	32.73	33.48
1903	23	4	35.43	0.39	35.95	35.02	35.30	35.44
1904	23	4	33.04	0.30	33.20	32.59	33.26	33.11
1905	23	4	33.60	1.41	32.68	32.88	33.14	35.70
1906	23	4	33.19	0.74	32.11	33.29	33.58	33.76
1901	24	4	22.76	0.54	23.21	23.22	22.18	22.41
1902	24	4	33.00	0.32	32.79	33.47	32.86	32.87
1903	24	4	36.54	0.50	36.11	37.17	36.17	36.70
1904	24	4	34.21	0.29	34.10	34.54	34.33	33.87
1905	24	4	35.53	0.35	35.96	35.17	35.65	35.36
1906	24	4	33.14	0.39	33.29	33.53	32.60	33.14
1901	25	4	22.63	0.60	22.79	22.98	23.00	21.74
1902	25	4	32.78	0.29	33.05	32.41	32.96	32.71
1903	25	4	36.82	1.47	35.10	37.50	36.22	38.47
1904	25	4	34.00	2.53 c	37.09	34.19	33.79	30.92
1905	25	4	36.60	1.45	34.70	36.23	37.82	37.64
1906	25	4	33.61	1.39	32.04	32.86	35.01	34.52
1901	26	4	20.90	0.77	21.69	20.19	20.30	21.44

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	32.93	0.45	33.27	32.37	32.78	33.31
1903	26	4	35.83	0.73	35.34	35.96	35.20	36.81
1904	26	4	33.79	0.98	32.80	33.48	33.75	35.13
1905	26	4	34.89	1.35	35.70	32.88	35.65	35.33
1906	26	4	31.55	1.49	29.81	30.87	33.09	32.43
1901	27	4	22.25	0.72	22.82	22.89	21.43	21.87
1902	27	4	33.90	0.45	33.77	34.44	33.38	34.02
1903	27	4	36.91	0.33	36.63	37.09	36.63	37.29
1904	27	4	33.17	0.60	33.92	33.41	32.67	32.69
1905	27	4	34.96	1.80	37.21	35.50	33.09	34.04
1906	27	4	34.65	1.50	35.87	35.98	33.69	33.06
1901	29	4	26.88	0.36	26.46	27.34	26.82	26.90
1902	29	4	35.48	0.56	35.01	35.81	35.00	36.08
1903	29	4	38.75	1.16	40.14	37.34	38.51	39.00
1904	29	4	35.67	2.24	38.32	35.40	36.09	32.88
1905	29	4	38.87	2.85 c	41.83	35.79	40.67	37.17
1906	29	4	35.14	2.31	37.80	32.74	36.25	33.74
1901	30	4	18.73	0.25	18.40	19.01	18.79	18.71
1902	30	4	30.56	0.29	30.59	30.32	30.96	30.38
1905	30	4	28.51	0.40	28.10	29.06	28.52	28.37
1906	30	4	27.67	0.10	27.70	27.80	27.58	27.60
1901	31	4	23.56	1.45	23.61	25.60	22.55	22.48
1902	31	4	34.38	1.41C	33.12	36.30	34.50	33.58
1903	31	4	34.44	1.30	35.31	33.46	33.20	35.79
1904	31	4	33.82	0.53	33.67	33.54	34.61	33.46
1905	31	4	35.21	2.56	32.78	34.68	38.82	34.57
1906	31	4	33.21	1.61	31.27	35.18	33.45	32.94
1901	32	4	22.76	0.25	22.96	22.76	22.92	22.41
1902	32	4	33.75	1.13C	32.18	34.62	34.53	33.69
1903	32	4	35.05	1.03	35.05	34.00	34.70	36.45
1904	32	4	33.35	0.50	33.20	32.72	33.85	33.65
1905	32	4	34.92	1.10	33.92	35.52	36.17	34.06
1906	32	4	33.27	0.67	32.34	33.60	33.88	33.27
1901	33	2	16.19	0.05	16.16	16.23		
1902	33	0	27.04B	0.22	27.31	26.96	26.80	27.09
1903	33	4	32.75	2.06	30.00	34.88	32.63	33.50
1904	33	4	29.16	0.77	30.03	28.79	28.30	29.53
1905	33	4	31.29	1.19	32.75	30.39	30.24	31.77
1906	33	4	28.10	1.76	29.98	27.65	28.87	25.88
1901	34	2	24.23	2.27C	25.84	22.62		
1902	34	2	34.53	0.45	34.85	34.21		
1903	34	2	37.28	0.24	37.10	37.45		
1904	34	2	35.04	1.36	36.00	34.08		
1905	34	2	35.48	0.32	35.26	35.71		
1906	34	2	34.60	1.78	35.86	33.34		
1901	35	4	21.56	0.82	22.44	20.90	20.81	22.08
1902	35	4	32.28	0.63	31.79	32.99	31.71	32.65
1903	35	4	34.97	0.85	34.09	35.32	35.99	34.49
1904	35	4	31.90	0.42	31.77	32.48	31.48	31.88
1905	35	4	34.13	0.44	34.49	33.72	33.77	34.53
1906	35	4	29.73	0.78	29.12	30.74	29.94	29.12
1901	36	4	21.78	0.38	21.57	22.15	21.36	22.05
1902	36	4	33.70	0.17	33.60	33.96	33.62	33.61

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	36.21	0.86	36.45	37.30	35.76	35.33				
1904	36	4	32.02	1.22	30.94	33.69	31.32	32.15				
1905	36	4	33.02	0.73	32.08	33.02	33.13	33.85				
1906	36	4	30.85	0.96	29.92	31.47	30.16	31.86				
1901	37	6	20.16	1.53	18.50	19.99	20.02	18.56	21.97	21.89		
1902	37	6	34.90	0.21	34.74	34.87	34.69	34.84	35.26	35.02		
1903	37	6	39.32	1.15	37.57	39.94	40.24	38.98	40.60	38.60		
1904	37	6	37.43	2.22	37.00	33.99	39.28	36.11	40.09	38.13		
1905	37	6	39.87	2.51	42.50	38.50	43.56	38.21	37.59	38.85		
1906	37	6	34.19	2.05	30.05	34.47	35.07	34.90	35.27	35.40		
1901	38	4	23.08	0.86	23.76	21.82	23.39	23.35				
1902	38	4	30.64	0.33	30.26	30.91	30.93	30.48				
1903	38	4	34.96	1.05	36.12	34.90	35.24	33.59				
1904	38	4	32.51	0.39	32.03	32.76	32.35	32.88				
1905	38	4	33.60	0.44	33.90	33.99	33.02	33.47				
1906	38	4	32.89	2.05	31.84	31.55	35.93	32.24				
1901	39	11	22.22	0.42	22.74	22.07	22.70	21.67	22.49	21.86	22.65	21.8
1902	39	11	32.37	0.16	32.45	32.56	32.42	32.65	32.11	32.17	32.26	32.4
1903	39	10	34.30	0.33	33.79	34.70	34.07	34.67	33.86	34.67	34.34	34.4
1904	39	9	31.81	0.47	31.42	32.56	31.39	32.23	31.36	31.43	32.28	31.5
1905	39	10	31.78	0.55	31.52	32.34	31.20	32.29	31.30	32.53	31.24	31.9
1906	39	10	31.86	0.24	32.33	31.87	31.63	31.59	32.05	31.67	32.08	31.7
1901	106	4	23.42	0.39	23.79	23.68	23.26	22.94				
1902	106	4	32.53	0.36	32.02	32.65	32.59	32.87				
1903	106	4	36.03	0.66	36.76	36.32	35.80	35.25				
1904	106	4	32.12	0.65	32.26	31.25	32.15	32.83				
1905	106	4	35.76	0.59	35.56	36.42	36.02	35.04				
1906	106	4	29.79	0.32	30.11	29.34	29.86	29.86				
1901	134	3	19.16	0.29	18.84	19.40	19.24					
1902	134	6	30.31	0.51	30.00	30.19	29.97	31.33	30.16	30.20		
1903	134	4	33.54	1.01	33.11	32.55	33.57	34.91				
1904	134	4	30.93	1.26	32.22	31.61	30.52	29.37				
1905	134	4	31.56	1.09	32.70	32.15	30.24	31.13				
1906	134	4	31.70	1.21	32.80	32.68	30.75	30.57				
1901	139	11	23.40	0.47	24.40	23.13	23.41	23.74	23.07	23.84	23.22	23.2
1902	139	11	33.53	0.34	34.26	33.54	33.49	33.36	33.47	33.33	33.15	33.9
1903	139	10	35.58	0.28	35.95	35.34	35.79	35.47	36.06	35.17	35.60	35.5
1904	139	10	33.04	0.37	33.20	32.55	33.55	32.96	33.32	32.64	33.44	32.9
1905	139	10	32.93	0.58	33.36	32.48	33.47	32.60	33.39	32.47	33.48	32.3
1906	139	10	33.20	0.36	33.45	33.56	33.11	33.71	32.82	33.30	32.97	33.1

18.6 Zucker / XZ

18.6.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	-0.19	-1.09	-1.01	-1.28	-1.11	-1.18
3	-4.47	-2.50	-1.84	-0.58	-1.65	-1.39
5	1.72	1.36	1.08	1.25	0.74	1.00
6	0.98	0.11	0.50	0.42	0.14	0.58
7	-0.48	0.46	-0.29	-0.15	-1.03	0.01
8	0.77	0.67	1.14	1.41	1.38	1.18
9	-1.12	-1.16	-1.22	-1.74	-1.43	-1.66
10	-0.74	-0.37	-0.44	-0.77	-0.62	-1.02
14	-0.33	-0.76	-1.59	-1.35	-1.23	-1.20
15	1.55	1.21	0.80	0.37	0.47	0.11
16	0.41	-0.54	-1.36	-1.32	-1.24	-1.18
17	-1.04	-0.22	0.42	0.24	1.26	1.33
18	-1.17	-1.80	-1.40	-1.57	-1.55	-1.13
19	-0.42	-1.04	-0.89	-1.30	-1.10	-1.00
20	0.92	-0.35	-0.29	-0.19	-0.03	-0.14
22	-1.22	-1.21	-1.13	-0.83	-1.52	-1.27
23	-0.05	-0.07	-0.41	-0.43	0.01	-0.86
24	1.47	1.25	1.25	1.07	1.00	0.81
25	1.34	1.73	1.87	1.60	1.62	1.28
26	1.20	1.99	0.41	1.47	2.49	1.71
27	1.25	0.32	0.58	0.45	0.62	0.31
29	-0.99	-0.21	0.38	-0.49	-0.28	0.47
30	1.24	1.37			1.08	1.71
31	-0.80	-0.61	-0.01	-0.12	-1.06	-1.11
32	0.16	2.26	2.05	2.82	2.52	3.19
33	3.05	3.43	3.27	2.34	2.83	1.90
34	-1.62	-2.37	-0.85	-2.11	-1.37	-1.48
35	1.59	-0.54	-0.26	0.06	0.31	-0.48
36	-0.06	0.35	0.11	1.38	0.62	0.45
37	1.72	1.03	-0.08	-0.52	-0.80	-0.10
38	-2.01	-1.77	-2.31	-1.19	-1.18	-1.30
39	1.96	1.92	2.53	2.10	1.84	1.45
106	-4.03	-3.46	-3.22	-3.23	-3.32	-2.17
134	-0.45	0.83	1.63	1.96	1.43	1.43
139	-0.16	-0.20	0.60	0.25	0.15	-0.28

18.6.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	5.16	0.11	5.11	5.35	5.22	5.08	5.06	5.12
1902	1	6	6.94	0.16	6.90	7.07	6.82	7.16	6.96	6.74
1903	1	6	4.31	0.18	4.58	4.39	4.37	4.18	4.30	4.05
1904	1	6	4.81	0.24	5.08	4.86	4.54	4.51	5.00	4.89
1905	1	6	5.10	0.16	5.16	5.16	5.02	4.96	5.36	4.96
1906	1	6	7.76	0.15	7.82	7.95	7.74	7.71	7.84	7.50
1901	3	4	3.02b	0.46	2.80	3.52	2.49	3.25		
1902	3	4	6.23	0.10	6.28	6.08	6.24	6.32		
1903	3	4	3.89	0.28	3.91	3.97	3.51	4.18		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	5.16	0.47	5.84	4.76	5.06	4.99
1905	3	4	4.83	0.19	4.56	4.95	4.97	4.86
1906	3	4	7.65	0.26	7.33	7.82	7.54	7.91
1901	5	4	6.11	0.11	6.11	6.17	5.96	6.20
1902	5	4	8.16	0.09	8.30	8.12	8.11	8.12
1903	5	4	5.36	0.08	5.36	5.33	5.27	5.46
1904	5	4	6.08	0.11	6.14	5.91	6.14	6.12
1905	5	4	6.03	0.16	5.97	6.04	5.85	6.23
1906	5	4	8.85	0.05	8.85	8.79	8.90	8.86
1901	6	4	5.74	0.10	5.81	5.84	5.66	5.64
1902	6	4	7.54	0.09	7.42	7.62	7.61	7.50
1903	6	4	5.06	0.09	5.03	4.96	5.13	5.13
1904	6	4	5.66	0.15	5.64	5.60	5.52	5.88
1905	6	4	5.73	0.34	5.80	5.25	5.81	6.05
1906	6	4	8.64	0.14	8.72	8.46	8.77	8.62
1901	7	4	5.01	0.48	4.66	5.72	4.86	4.81
1902	7	4	7.72	0.49	7.87	6.98	7.99	8.03
1903	7	4	4.67	0.48	4.92	4.51	4.07	5.17
1904	7	4	5.38	0.39	5.84	4.90	5.31	5.46
1905	7	4	5.14	0.28	4.79	5.05	5.39	5.34
1906	7	4	8.35	0.39	8.02	8.90	8.17	8.31
1901	8	4	5.63	0.35	5.99	5.83	5.21	5.49
1902	8	4	7.82	0.29	8.04	7.62	7.52	8.10
1903	8	4	5.39	0.20	5.57	5.26	5.54	5.17
1904	8	4	6.16	0.29	6.01	6.08	5.96	6.58
1905	8	4	6.35	0.28	6.70	6.43	6.12	6.13
1906	8	4	8.94	0.57	9.40	9.22	9.02	8.12
1901	9	4	4.69	0.22	4.79	4.37	4.76	4.84
1902	9	4	6.90	0.21	7.00	7.02	7.00	6.59
1903	9	4	4.20	0.14	4.40	4.18	4.06	4.17
1904	9	4	4.58	0.20	4.55	4.54	4.38	4.86
1905	9	4	4.94	0.11	5.05	4.82	4.90	5.00
1906	9	4	7.52	0.09	7.60	7.50	7.57	7.40
1901	10	4	4.88	0.07	4.83	4.98	4.84	4.87
1902	10	4	7.30	0.15	7.32	7.19	7.19	7.50
1903	10	4	4.60	0.17	4.57	4.59	4.41	4.82
1904	10	4	5.07	0.11	4.97	5.02	5.23	5.07
1905	10	4	5.35	0.19	5.33	5.16	5.30	5.62
1906	10	4	7.84	0.18	8.05	7.86	7.85	7.61
1901	14	4	5.09	0.08	5.12	5.15	4.97	5.10
1902	14	4	7.11	0.07	7.01	7.14	7.09	7.17
1903	14	4	4.02	0.15	4.07	3.80	4.06	4.14
1904	14	4	4.78	0.36	5.28	4.80	4.44	4.59
1905	14	4	5.04	0.18	4.79	5.04	5.22	5.13
1906	14	4	7.75	0.10	7.89	7.75	7.70	7.66
1901	15	4	6.02	0.11	5.88	5.99	6.10	6.13
1902	15	4	8.09	0.19	7.87	8.10	8.33	8.08
1903	15	4	5.21	0.11	5.34	5.18	5.08	5.26
1904	15	4	5.64	0.20	5.45	5.70	5.51	5.90
1905	15	4	5.89	0.10	5.82	5.97	5.98	5.80
1906	15	4	8.40	0.09	8.48	8.46	8.40	8.28
1901	16	4	5.46	0.11	5.47	5.59	5.44	5.32
1902	16	4	7.21	0.05	7.23	7.14	7.26	7.23

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	4.14	0.13	4.08	4.02	4.31	4.13
1904	16	4	4.79	0.12	4.80	4.87	4.87	4.62
1905	16	4	5.04	0.41	5.26	5.19	4.42	5.28
1906	16	4	7.76	0.12	7.64	7.75	7.72	7.92
1901	17	4	4.73	0.20	4.88	4.48	4.92	4.64
1902	17	4	7.38	0.14	7.38	7.21	7.56	7.36
1903	17	4	5.02	0.15	5.10	5.13	4.80	5.06
1904	17	4	5.57	0.09	5.61	5.67	5.47	5.54
1905	17	4	6.29	0.24	6.20	6.62	6.27	6.06
1906	17	4	9.02	0.07	9.11	8.98	8.94	9.04
1901	18	4	4.66	0.19	4.59	4.52	4.60	4.94
1902	18	4	6.58	0.07	6.54	6.63	6.51	6.66
1903	18	4	4.11	0.05	4.13	4.12	4.04	4.16
1904	18	4	4.67	0.12	4.70	4.49	4.69	4.78
1905	18	4	4.88	0.06	4.90	4.95	4.81	4.88
1906	18	4	7.78	0.13	7.67	7.98	7.77	7.72
1901	19	4	5.04	0.01	5.05	5.03	5.04	5.03
1902	19	4	6.96	0.13	6.83	7.01	6.89	7.12
1903	19	4	4.37	0.13	4.33	4.20	4.46	4.50
1904	19	4	4.80	0.12	4.88	4.69	4.71	4.93
1905	19	4	5.11	0.10	5.02	5.25	5.06	5.10
1906	19	4	7.85	0.11	7.81	8.01	7.78	7.78
1901	20	4	5.71	0.07	5.79	5.73	5.69	5.62
1902	20	4	7.31	0.09	7.30	7.19	7.39	7.35
1903	20	4	4.67	0.06	4.67	4.76	4.62	4.63
1904	20	4	5.36	0.15	5.38	5.22	5.27	5.55
1905	20	4	5.64	0.08	5.58	5.72	5.69	5.57
1906	20	4	8.28	0.33	8.21	8.75	8.15	8.00
1901	22	4	4.64	0.37	4.16	5.01	4.54	4.84
1902	22	4	6.88	0.13	6.71	6.86	7.04	6.91
1903	22	4	4.25	0.50	4.82	3.63	4.17	4.38
1904	22	4	5.04	0.26	4.91	5.41	5.03	4.80
1905	22	4	4.90	0.17	5.12	4.89	4.71	4.86
1906	22	4	7.71	0.32	7.78	7.40	7.54	8.14
1901	23	4	5.23	0.25	5.36	5.47	5.18	4.89
1902	23	4	7.45	0.12	7.28	7.50	7.57	7.44
1903	23	4	4.61	0.16	4.52	4.73	4.43	4.75
1904	23	4	5.24	0.11	5.27	5.37	5.19	5.13
1905	23	4	5.66	0.09	5.74	5.70	5.53	5.68
1906	23	4	7.92	0.08	8.00	7.93	7.94	7.81
1901	24	4	5.99	0.10	6.01	5.92	5.90	6.12
1902	24	4	8.11	0.11	8.00	8.04	8.16	8.24
1903	24	4	5.44	0.10	5.51	5.32	5.40	5.52
1904	24	4	5.99	0.07	6.08	5.96	5.95	5.96
1905	24	4	6.16	0.12	5.98	6.18	6.18	6.28
1906	24	4	8.75	0.07	8.69	8.76	8.85	8.71
1901	25	4	5.92	0.18	5.65	6.01	6.00	6.01
1902	25	4	8.35	0.21	8.16	8.28	8.65	8.30
1903	25	4	5.75	0.05	5.79	5.70	5.71	5.80
1904	25	4	6.25	0.40	5.87	6.05	6.80	6.29
1905	25	4	6.47	0.13	6.65	6.47	6.41	6.34
1906	25	4	8.99	0.29	9.30	9.03	9.02	8.60
1901	26	4	5.85	0.78C	7.00	5.67	5.38	5.35

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	8.48	0.72C	7.96	9.07	9.13	7.76
1903	26	4	5.02	0.54 c	4.63	4.56	5.15	5.73
1904	26	4	6.19	1.57C	7.41	4.81	7.68	4.85
1905	26	4	6.91	1.10C	7.77	6.94	5.35	7.57
1906	26	4	9.21	1.16C	9.92	9.00	10.24	7.66
1901	27	4	5.88	0.11	5.92	5.77	6.01	5.80
1902	27	4	7.64	0.14	7.85	7.57	7.61	7.54
1903	27	4	5.10	0.14	5.21	5.07	4.91	5.22
1904	27	4	5.68	0.27	5.84	5.95	5.54	5.37
1905	27	4	5.97	0.13	6.08	6.07	5.84	5.89
1906	27	4	8.50	0.17	8.31	8.69	8.59	8.43
1901	29	4	4.76	0.50	5.49	4.39	4.53	4.60
1902	29	4	7.38	0.18	7.52	7.33	7.51	7.15
1903	29	4	5.00	0.35	4.83	5.12	5.43	4.63
1904	29	4	5.21	0.57	5.92	5.31	5.04	4.55
1905	29	4	5.52	0.31	5.18	5.77	5.32	5.79
1906	29	4	8.58	0.60 c	7.88	9.29	8.82	8.36
1901	30	4	5.87	0.06	5.85	5.82	5.86	5.95
1902	30	4	8.17	0.19	8.02	8.23	8.41	8.03
1905	30	4	6.20	0.18	6.18	5.96	6.38	6.27
1906	30	4	9.20	0.13	9.03	9.22	9.20	9.36
1901	31	4	4.85	0.53	4.72	4.22	5.50	4.96
1902	31	4	7.18	0.65C	7.43	6.21	7.61	7.46
1903	31	4	4.81	0.22	5.03	4.69	4.96	4.55
1904	31	4	5.39	0.44	5.84	5.66	4.88	5.17
1905	31	4	5.13	0.89C	5.60	5.37	3.81	5.73
1906	31	4	7.79	0.59	8.34	6.97	8.06	7.80
1901	32	4	5.33	0.38	4.96	5.66	5.03	5.66
1902	32	4	8.62	0.41	9.12	8.29	8.28	8.79
1903	32	4	5.84	0.74C	6.66	5.14	5.28	6.26
1904	32	4	6.86	0.52	6.92	7.33	7.07	6.13
1905	32	4	6.92	0.49	6.93	6.57	6.57	7.60
1906	32	4	9.94	0.45	9.40	10.40	10.21	9.78
1901	33	2	6.78	0.13	6.87	6.69		
1902	33	4	9.20	0.17	9.15	9.01	9.23	9.42
1903	33	4	6.45	0.36	6.53	6.28	6.91	6.07
1904	33	4	6.62	0.36	6.54	6.74	7.03	6.18
1905	33	4	7.07	0.20	7.18	6.90	7.29	6.92
1906	33	4	9.30	0.38	8.74	9.53	9.37	9.54
1901	34	2	4.44	0.20	4.58	4.29		
1902	34	2	6.30	0.01	6.31	6.29		
1903	34	2	4.39	0.34	4.15	4.63		
1904	34	2	4.40	0.08	4.35	4.45		
1905	34	2	4.98	0.20	5.11	4.84		
1906	34	2	7.61	0.21	7.76	7.47		
1901	35	4	6.05	0.33	6.54	5.91	5.86	5.88
1902	35	4	7.21	0.41	6.72	7.31	7.12	7.70
1903	35	4	4.68	0.30	4.64	4.28	4.83	4.98
1904	35	4	5.48	0.24	5.25	5.31	5.67	5.70
1905	35	4	5.81	0.25	5.83	5.75	5.53	6.13
1906	35	4	8.11	0.29	8.33	7.76	8.37	7.99
1901	36	4	5.22	0.17	5.41	5.26	5.00	5.22
1902	36	4	7.66	0.23	7.75	7.43	7.52	7.94

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values								
1903	36	4	4.87	0.20	4.62	4.84	4.89	5.12					
1904	36	4	6.14	0.22	5.84	6.14	6.26	6.33					
1905	36	4	5.97	0.33	5.81	6.16	5.59	6.32					
1906	36	4	8.58	0.17	8.78	8.62	8.39	8.51					
1901	37	6	6.11	0.17	6.07	6.29	6.20	6.29	5.96	5.87			
1902	37	6	8.00	0.22	7.72	8.03	8.28	8.13	8.10	7.75			
1903	37	6	4.77	0.25	4.68	4.81	4.82	4.97	4.33	5.02			
1904	37	6	5.19	0.31	4.96	5.36	5.16	5.27	4.76	5.64			
1905	37	6	5.26	0.16	5.06	5.23	5.07	5.39	5.45	5.33			
1906	37	6	8.30	0.15	8.26	8.19	8.49	8.08	8.39	8.39			
1901	38	4	4.24	0.47	4.28	3.60	4.70	4.40					
1902	38	4	6.60	0.43	6.21	6.72	7.15	6.31					
1903	38	4	3.66	0.33	3.26	3.94	3.91	3.52					
1904	38	4	4.86	0.31	4.41	4.93	4.98	5.12					
1905	38	4	5.07	0.37	5.46	5.21	5.03	4.58					
1906	38	4	7.70	0.38	7.96	7.76	7.93	7.15					
1901	39	12	6.23	0.25	6.18	6.04	6.24	5.95	6.34	6.00	5.99	6.04	6.34
1902	39	11	8.45	0.13	8.25	8.36	8.45	8.67	8.28	8.57	8.51	8.60	8.43
1903	39	10	6.08	0.10	6.04	6.23	6.21	6.04	6.07	6.19	5.99	5.97	5.90
1904	39	9	6.50	0.17	6.41	6.49	6.78	6.14	6.60	6.49	6.47	6.48	6.62
1905	39	10	6.58	0.18	6.31	6.61	6.47	6.91	6.58	6.37	6.47	6.70	6.50
1906	39	10	9.07	0.17	9.11	9.24	8.86	9.10	8.84	9.06	8.90	9.36	9.14
1901	106	4	3.24b	0.16	3.42	3.09	3.12	3.31					
1902	106	4	5.75	0.14	5.71	5.69	5.65	5.96					
1903	106	4	3.20	0.04	3.18	3.21	3.16	3.26					
1904	106	4	3.84	0.16	4.07	3.78	3.71	3.78					
1905	106	4	4.00	0.05	4.00	4.06	3.99	3.95					
1906	106	4	7.27	0.08	7.20	7.29	7.20	7.37					
1901	134	3	5.02	0.33	5.30	4.66	5.11						
1902	134	6	7.90	0.25	7.49	7.84	7.96	7.80	8.19	8.11			
1903	134	4	5.63	0.31	5.68	5.84	5.18	5.81					
1904	134	4	6.43	0.43	6.31	5.87	6.79	6.75					
1905	134	4	6.38	0.09	6.30	6.47	6.31	6.42					
1906	134	4	9.07	0.21	9.08	9.00	9.34	8.84					
1901	139	11	5.17	0.17	4.97	5.24	5.19	5.12	5.29	5.40	4.93	5.39	4.94
1902	139	11	7.39	0.18	7.36	7.30	7.34	7.10	7.40	7.65	7.45	7.22	7.70
1903	139	10	5.12	0.20	5.26	5.14	4.88	5.37	5.08	5.42	4.80	4.97	5.15
1904	139	10	5.58	0.23	5.41	5.77	5.49	5.94	5.15	5.58	5.62	5.44	5.53
1905	139	10	5.73	0.09	5.90	5.54	5.75	5.76	5.72	5.75	5.73	5.74	5.75
1906	139	10	8.21	0.16	8.23	7.85	8.31	8.15	8.14	8.16	8.40	8.20	8.38

18.7 aNDFom

18.7.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	0.30	0.66	0.51	0.52	0.41	0.63
3	-2.34	-1.71	-1.00	-1.65	-0.85	-1.19
5	1.75	0.59	0.94	1.03	0.77	1.88
6	0.06	0.12	0.38	0.78	0.55	0.71
7	1.15	0.31	0.70	0.79	1.31	0.97
8	0.77	0.00	-0.02	0.93	0.24	0.21
9	-0.41	-0.87	0.13	-1.02	0.10	0.96
10	-0.18	-0.21	-0.13	0.18	-0.16	-0.36
14	0.28	-0.52	-1.44	0.20	-0.05	-0.17
15	0.37	-0.20	-0.52	-0.93	-0.60	-0.87
16	0.89	0.77	-0.77	-0.66	-0.25	-0.50
17	0.39	0.04	-0.34	-0.77	-0.05	-0.25
18	0.27	0.40	0.65	0.72	1.98	1.13
19	0.28	0.34	0.62	0.72	1.88	1.19
20	0.38	0.57	0.85	0.99	2.14	1.38
22	-4.32	-4.12	-4.47	-3.52	-4.00	-4.00
23	0.13	-0.08	0.48	0.41	0.59	0.14
24	0.01	-0.16	-0.09	-0.37	-0.20	-0.37
25	0.65	0.51	-0.39	-0.23	-0.71	-0.14
26	0.48	-0.18	0.39	-0.37	-0.32	0.68
27	0.42	-0.20	0.11	1.10	0.50	-0.42
29	-1.55	-0.82	-1.26	0.23	-1.48	-0.92
30	-4.04	-4.44			-2.56	-3.23
31	-0.51	-0.52	0.41	-0.94	-0.43	-0.60
32	-0.43	-1.06	-0.62	-1.42	-1.36	-1.51
33	3.38	3.15	1.94	2.47	1.94	2.79
34	0.67	0.19	0.33	-0.44	0.83	0.08
35	0.17	-0.01	0.62	0.47	0.63	1.77
36	0.65	-0.32	-0.22	0.20	0.59	0.97
37	3.18	0.99	0.79	0.53	0.05	2.28
38	0.69	1.75	0.23	0.00	0.59	-0.61
39	-0.19	-0.13	0.51	0.34	1.51	0.47
106	0.40	0.91	-0.17	-0.11	-1.28	0.96
134	-3.91	-3.69	-3.57	-4.34	-3.21	-3.83
139	-0.32	-0.63	-0.07	-0.19	0.89	-0.23

18.7.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	56.11	0.54	55.65	56.34	56.61	56.40	55.24	56.41
1902	1	6	43.22	0.46	42.77	43.07	43.60	42.68	43.32	43.85
1903	1	6	43.79	0.93	43.60	42.85	42.84	45.03	44.75	43.70
1904	1	6	46.39	2.07	46.13	48.79	43.05	45.16	47.66	47.58
1905	1	6	44.28	1.49	42.54	42.77	43.99	46.30	45.54	44.51
1906	1	6	43.86	0.79	43.67	42.50	44.41	44.32	44.65	43.59
1901	3	4	51.47	0.50	51.42	51.28	52.18	51.02		
1902	3	4	39.06	0.40	39.55	38.68	38.78	39.22		
1903	3	4	41.15	0.85	41.45	41.98	41.19	39.97		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	42.59	1.18	41.13	42.14	43.67	43.41
1905	3	4	42.07	0.48	42.03	41.90	42.74	41.63
1906	3	4	40.68	0.57	41.50	40.29	40.30	40.65
1901	5	4	58.63	0.26	58.49	58.96	58.38	58.70
1902	5	4	43.09	0.13	43.19	43.18	43.08	42.91
1903	5	4	44.55	0.25	44.18	44.64	44.69	44.69
1904	5	4	47.28	0.39	47.51	46.75	47.25	47.63
1905	5	4	44.91	0.38	44.55	44.62	45.35	45.10
1906	5	4	46.05	0.64	45.82	45.72	45.66	47.01
1901	6	4	55.69	0.27	55.90	55.71	55.84	55.31
1902	6	4	42.26	0.37	42.42	42.63	42.22	41.77
1903	6	4	43.56	0.77	42.93	43.41	44.67	43.22
1904	6	4	46.84	0.94	45.48	47.25	47.60	47.03
1905	6	4	44.54	0.54	43.84	44.42	45.07	44.82
1906	6	4	44.00	0.68	43.06	44.66	44.25	44.03
1901	7	4	57.60	0.28	57.66	57.29	57.49	57.95
1902	7	4	42.60	0.40	42.62	42.11	43.09	42.57
1903	7	4	44.13	0.14	44.23	44.10	44.24	43.95
1904	7	4	46.86	0.35	47.23	47.08	46.62	46.51
1905	7	4	45.87	0.48	45.39	45.54	46.37	46.17
1906	7	4	44.45	0.12	44.41	44.44	44.62	44.32
1901	8	4	56.93	0.69	56.45	57.62	57.42	56.23
1902	8	4	42.06	0.17	42.25	42.04	41.85	42.10
1903	8	4	42.86	0.52	42.41	43.48	42.46	43.10
1904	8	4	47.11	0.37	47.02	46.70	47.60	47.11
1905	8	4	43.99	0.90	43.22	44.23	43.34	45.15
1906	8	4	43.13	0.41	42.85	43.16	42.81	43.71
1901	9	4	54.85	0.28	54.96	54.60	54.65	55.21
1902	9	4	40.53	0.50	40.76	40.19	40.05	41.13
1903	9	4	43.13	0.80	44.03	43.57	42.45	42.46
1904	9	4	43.70	1.02	42.25	44.63	43.86	44.05
1905	9	4	43.74	1.12	42.65	44.89	42.92	44.50
1906	9	4	44.44	0.36	44.02	44.81	44.65	44.26
1901	10	4	55.26	0.38	55.05	54.88	55.73	55.40
1902	10	4	41.68	0.25	41.93	41.84	41.37	41.58
1903	10	4	42.67	0.60	41.79	43.12	42.82	42.94
1904	10	4	45.79	0.58	45.14	46.03	45.52	46.47
1905	10	4	43.29	0.33	42.87	43.60	43.51	43.19
1906	10	4	42.13	0.46	41.89	42.82	41.99	41.83
1901	14	4	56.06	0.24	56.42	56.01	55.94	55.88
1902	14	4	41.15	0.26	40.76	41.34	41.20	41.29
1903	14	4	40.38	1.91	40.26	39.62	38.58	43.06
1904	14	4	45.83	0.73	46.91	45.34	45.58	45.47
1905	14	4	43.48	0.43	43.42	43.90	42.90	43.69
1906	14	4	42.47	0.22	42.25	42.74	42.33	42.56
1901	15	4	56.22	0.38	55.90	56.25	55.98	56.74
1902	15	4	41.71	0.52	41.44	42.36	41.86	41.17
1903	15	4	41.99	0.44	42.43	41.49	41.75	42.28
1904	15	4	43.85	0.79	42.69	44.12	44.17	44.42
1905	15	4	42.51	0.93	42.90	41.76	41.74	43.66
1906	15	4	41.24	0.45	40.62	41.61	41.54	41.16
1901	16	4	57.13	0.52	56.60	57.02	57.85	57.05
1902	16	4	43.40	0.38	43.13	43.88	43.52	43.08

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	41.56	1.07	40.62	40.73	42.86	42.02
1904	16	4	44.32	1.32	43.84	45.49	45.27	42.67
1905	16	4	43.12	1.70	41.96	44.62	41.36	44.53
1906	16	4	41.88	1.29	40.87	40.67	43.14	42.85
1901	17	4	56.26	0.47	56.75	56.42	55.64	56.23
1902	17	4	42.12	0.38	41.56	42.36	42.39	42.17
1903	17	4	42.30	0.41	42.84	42.20	42.31	41.84
1904	17	4	44.13	0.42	44.46	44.44	43.56	44.04
1905	17	4	43.48	0.25	43.59	43.78	43.23	43.33
1906	17	4	42.31	0.65	42.94	41.43	42.62	42.27
1901	18	4	56.05	0.63	56.18	55.29	56.81	55.90
1902	18	4	42.75	0.18	42.77	42.66	42.99	42.56
1903	18	4	44.03	0.06	44.01	43.96	44.07	44.10
1904	18	4	46.73	0.44	46.29	47.34	46.65	46.66
1905	18	4	47.04	1.02	48.47	47.01	46.49	46.17
1906	18	4	44.73	0.39	45.28	44.74	44.50	44.41
1901	19	4	56.06	0.57	56.09	55.40	56.78	55.97
1902	19	4	42.65	0.15	42.60	42.56	42.88	42.57
1903	19	4	43.98	0.13	44.14	43.82	44.01	43.94
1904	19	4	46.74	0.34	46.36	47.17	46.76	46.66
1905	19	4	46.86	0.97	48.23	46.80	46.39	46.01
1906	19	4	44.85	0.34	45.29	44.94	44.59	44.58
1901	20	4	56.24	0.95	56.41	54.95	57.24	56.37
1902	20	4	43.05	0.32	43.37	43.23	42.98	42.63
1903	20	4	44.39	0.27	43.98	44.51	44.54	44.53
1904	20	4	47.21	0.37	46.75	47.63	47.10	47.35
1905	20	4	47.30	1.09	48.65	47.70	46.63	46.23
1906	20	4	45.17	0.53	45.83	45.35	44.87	44.63
1901	22	4	48.02 b	0.55	48.46	47.22	48.18	48.21
1902	22	0	34.85B	0.34	34.74	35.17	35.06	34.42
1903	22	0	35.07B	0.31	34.82	35.39	35.28	34.79
1904	22	4	39.31B	1.00	38.21	39.09	40.63	39.30
1905	22	4	36.57 b	0.47	36.54	36.81	37.02	35.92
1906	22	4	35.77 b	0.55	36.06	35.16	36.37	35.48
1901	23	4	55.81	0.48	55.10	56.11	56.09	55.95
1902	23	4	41.91	0.23	41.62	41.82	42.10	42.11
1903	23	4	43.73	0.49	43.52	43.59	44.45	43.37
1904	23	4	46.19	0.15	46.13	46.24	46.02	46.37
1905	23	4	44.59	0.93	45.23	45.09	44.84	43.22
1906	23	4	43.01	0.59	43.80	43.09	42.48	42.66
1901	24	4	55.60	0.27	55.59	55.46	55.37	55.98
1902	24	4	41.77	0.22	41.73	42.00	41.49	41.88
1903	24	4	42.73	0.20	42.84	42.74	42.90	42.44
1904	24	4	44.82	0.22	45.16	44.67	44.73	44.74
1905	24	4	43.22	0.58	42.85	43.24	42.76	44.02
1906	24	4	42.11	0.26	41.91	41.87	42.33	42.34
1901	25	4	56.71	0.58	56.40	56.52	56.35	57.58
1902	25	4	42.95	0.33	42.94	43.33	42.53	43.00
1903	25	4	42.21	1.21	43.61	42.01	42.53	40.70
1904	25	4	45.07	2.00	43.41	44.77	44.15	47.94
1905	25	4	42.31	0.61	43.13	42.24	41.66	42.23
1906	25	4	42.52	1.03	43.37	43.08	41.05	42.56
1901	26	4	56.42	1.99	53.56	56.78	57.14	58.18

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	41.73	1.06C	41.84	40.65	41.31	43.14
1903	26	4	43.59	1.53	44.79	43.94	44.26	41.35
1904	26	4	44.83	1.27	43.86	46.43	43.76	45.27
1905	26	4	43.01	1.97	40.67	45.06	44.14	42.17
1906	26	4	43.94	2.53C	43.88	46.25	40.43	45.20
1901	27	4	56.31	0.66	56.09	55.77	57.28	56.09
1902	27	4	41.70	0.23	41.68	41.40	41.79	41.94
1903	27	4	43.09	0.63	43.60	43.31	43.27	42.17
1904	27	4	47.40	0.16	47.28	47.34	47.63	47.33
1905	27	4	44.43	1.61	42.69	43.52	46.21	45.32
1906	27	4	42.03	0.98	40.87	41.66	42.42	43.16
1901	29	4	52.86	0.62	53.10	52.05	52.77	53.51
1902	29	4	40.61	0.35	40.31	40.31	40.91	40.91
1903	29	4	40.70	0.85	39.60	41.55	40.49	41.16
1904	29	4	45.87	2.54 c	43.06	45.68	45.52	49.23
1905	29	4	40.98	1.57	39.90	42.81	39.47	41.73
1906	29	4	41.15	1.70	39.14	41.30	40.90	43.28
1901	30	4	48.50 b	0.17	48.68	48.32	48.41	48.61
1902	30	0	34.29B	0.29	34.41	34.18	33.95	34.63
1905	30	4	39.08	0.33	39.44	39.00	38.66	39.22
1906	30	4	37.10	0.14	37.29	36.95	37.05	37.10
1901	31	4	54.68	0.60	54.52	54.25	54.40	55.57
1902	31	4	41.14	0.80	42.06	40.47	40.48	41.56
1903	31	4	43.62	1.35	42.46	44.55	45.00	42.46
1904	31	4	43.83	0.73	42.87	43.79	44.03	44.63
1905	31	4	42.82	1.60	44.25	42.90	40.56	43.57
1906	31	4	41.71	1.20	43.04	40.15	41.60	42.05
1901	32	4	54.83	0.24	54.93	54.93	54.46	54.98
1902	32	4	40.19	0.84	41.05	40.28	39.04	40.38
1903	32	4	41.80	1.36	41.03	43.14	42.74	40.30
1904	32	4	42.98	0.49	43.35	42.74	42.41	43.43
1905	32	4	41.18	1.42	42.90	41.16	39.43	41.24
1906	32	4	40.11	1.70	42.21	39.59	38.16	40.47
1901	33	2	61.49	0.36	61.24	61.75		
1902	33	4	47.57	0.43	47.02	47.75	48.03	47.49
1903	33	4	46.30	1.46	48.32	44.85	46.17	45.86
1904	33	4	49.80	0.48	50.02	50.37	49.39	49.40
1905	33	4	46.95	1.25	45.46	48.35	47.51	46.49
1906	33	4	47.65	0.98	46.62	47.84	47.22	48.91
1901	34	2	56.74	2.07C	55.28	58.21		
1902	34	2	42.39	0.32	42.62	42.16		
1903	34	2	43.48	0.00	43.48	43.48		
1904	34	2	44.71	0.39	44.44	44.98		
1905	34	2	45.01	0.48	44.67	45.35		
1906	34	2	42.89	1.20	42.05	43.74		
1901	35	4	55.88	0.55	55.78	56.17	56.40	55.15
1902	35	4	42.04	0.63	42.95	41.85	41.86	41.52
1903	35	4	43.98	0.59	44.34	43.67	43.31	44.60
1904	35	4	46.30	0.47	46.61	45.60	46.49	46.51
1905	35	4	44.67	0.75	44.31	45.05	45.51	43.82
1906	35	4	45.86	0.63	46.51	45.18	45.48	46.26
1901	36	4	56.72	0.41	57.31	56.54	56.63	56.39
1902	36	4	41.50	0.25	41.22	41.38	41.62	41.78

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	42.51	0.83	42.00	41.60	43.19	43.25				
1904	36	4	45.83	1.06	46.89	44.52	46.47	45.46				
1905	36	4	44.60	0.74	45.62	44.49	44.47	43.84				
1906	36	4	44.45	1.02	45.27	44.04	45.29	43.21				
1901	37	6	61.15	1.48	62.52	61.47	61.29	62.79	59.11	59.69		
1902	37	6	43.79	0.24	44.12	43.57	43.88	43.99	43.54	43.62		
1903	37	6	44.27	0.93	45.67	43.47	43.47	45.13	43.72	44.17		
1904	37	6	46.41	2.29	47.14	49.67	44.76	48.23	44.81	43.85		
1905	37	6	43.66	2.18	41.11	43.88	40.97	45.73	45.95	44.31		
1906	37	6	46.75	1.79	50.30	46.01	46.40	46.39	46.12	45.28		
1901	38	4	56.78	1.07	56.13	58.37	56.37	56.24				
1902	38	4	45.12	0.65	45.51	44.72	44.44	45.83				
1903	38	4	43.30	0.80	42.29	43.58	43.13	44.19				
1904	38	4	45.48	0.45	45.79	44.95	45.90	45.27				
1905	38	4	44.60	0.49	44.22	44.15	44.90	45.15				
1906	38	4	41.68	1.97	42.16	43.05	38.78	42.75				
1901	39	11	56.11	0.62	55.51	56.48	55.48	57.22	55.70	56.74	55.68	56.3
1902	39	11	41.82	0.16	41.83	41.89	41.83	41.64	42.02	42.04	41.57	41.7
1903	39	10	43.78	0.12	43.78	43.66	43.73	43.65	43.72	43.93	43.94	43.6
1904	39	9	46.07	0.28	46.42	45.83	46.09	45.88	46.21	46.45	45.78	46.2
1905	39	10	46.21	0.55	46.55	45.73	46.58	45.63	46.69	45.48	46.80	45.9
1906	39	10	43.58	0.13	43.45	43.70	43.77	43.70	43.57	43.68	43.45	43.4
1901	106	4	56.27	1.49	54.25	56.44	57.84	56.57				
1902	106	4	43.64	1.21C	44.35	44.60	43.69	41.91				
1903	106	4	42.60	1.68	41.85	41.16	42.36	45.01				
1904	106	4	45.29	2.08	44.51	47.93	45.71	43.01				
1905	106	4	41.33	1.44	41.13	40.32	40.46	43.43				
1906	106	4	44.43	0.64	43.77	45.19	44.06	44.71				
1901	134	3	48.74	0.20	48.87	48.84	48.51					
1902	134	6	35.59B	0.34	36.01	35.89	35.68	35.08	35.41	35.47		
1903	134	4	36.65B	0.64	36.98	36.93	36.99	35.69				
1904	134	0	37.88B	0.43	37.54	38.41	37.52	38.02				
1905	134	4	37.95 b	0.99	37.24	37.02	39.12	38.42				
1906	134	4	36.05 b	1.59	34.91	34.54	36.86	37.88				
1901	139	11	55.01	0.47	54.44	55.51	54.59	54.70	55.37	54.89	55.41	54.4
1902	139	11	40.95	0.10	40.91	40.92	41.15	40.85	40.96	40.86	41.02	40.8
1903	139	10	42.78	0.14	42.80	43.02	42.78	42.67	42.62	42.69	42.66	42.7
1904	139	10	45.14	0.18	45.11	45.39	45.10	45.25	45.01	45.25	44.82	44.9
1905	139	10	45.13	0.52	44.76	45.66	44.48	45.55	44.86	45.53	44.52	45.6
1906	139	10	42.36	0.27	42.24	42.55	42.44	41.83	42.43	42.22	42.48	42.1

18.8 ADFom

18.8.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	-0.77	-0.66	-0.43	-0.46	-0.95	-0.37
3	-2.31	-1.75	-0.73	-1.65	-1.16	-1.66
5	1.00	0.04	0.40	0.65	-0.22	1.03
6	0.06	0.33	0.54	1.09	0.22	0.55
7	-0.10	-0.15	0.54	0.42	0.87	0.27
8	0.40	-0.12	-0.34	0.78	-0.42	-0.29
9	0.00	0.16	1.01	-0.90	0.37	1.53
10	-0.16	-0.04	0.04	0.23	-0.51	-0.56
14	0.38	-0.48	-2.15	0.23	-0.28	-0.15
15	0.13	-0.16	-0.19	-0.96	-0.86	-1.01
16	-0.67	-0.74	-2.43	-1.84	-1.82	-1.85
17	-0.58	-0.10	-0.93	-1.16	-0.63	-0.35
18	-0.37	-0.31	0.20	0.12	1.16	0.26
19	-0.46	-0.34	0.13	0.09	1.17	0.33
20	-0.70	-0.61	-0.14	0.03	0.98	0.20
22	1.08	1.08	0.36	1.22	0.39	0.70
23	0.68	0.79	1.11	0.78	1.09	0.32
24	0.12	0.48	0.06	-0.23	-0.53	-0.35
25	0.52	0.92	0.04	0.38	-0.89	-0.16
26	1.35	1.09	0.90	0.32	0.85	1.61
27	0.50	0.24	0.38	1.23	0.39	-0.57
29	-2.79	-1.42	-1.58	-0.40	-2.25	-1.46
30	1.11	1.00			2.55	1.71
31	0.18	0.40	1.49	0.20	0.24	0.05
32	-1.25	-1.04	-0.43	-1.32	-1.11	-1.18
33	-0.48	-0.17	-1.02	-0.29	-0.95	-0.53
34	0.56	-0.26	0.34	-0.21	0.36	-0.49
35	0.39	0.77	0.66	0.43	0.04	0.91
36	-0.02	-0.51	-0.48	-0.14	0.27	0.16
37	2.75	0.16	-0.25	-0.39	-1.21	1.21
38	0.05	0.99	-0.02	-0.48	-0.61	-1.13
39	-1.34	-0.49	0.27	-0.03	0.81	-0.42
106	0.25	0.85	1.30	1.91	0.71	2.10
134	1.41	1.19	1.72	1.01	1.70	0.63
139	-1.43	-1.12	-0.36	-0.66	0.22	-1.06

18.8.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	29.41	0.42	28.88	29.62	30.01	29.45	28.97	29.51
1902	1	6	21.28	0.20	20.95	21.48	21.36	21.19	21.23	21.48
1903	1	6	22.01	0.82	22.15	21.08	21.26	23.33	22.36	21.84
1904	1	6	22.39	1.43	22.30	24.27	20.21	21.40	23.10	23.07
1905	1	6	22.26	1.06	21.01	21.41	22.06	23.49	23.59	22.03
1906	1	6	22.74	0.44	22.74	22.01	22.87	23.07	23.24	22.53
1901	3	4	27.71	0.48	27.50	27.52	28.42	27.41		
1902	3	4	20.08	0.13	19.92	20.09	20.06	20.23		
1903	3	4	21.68	0.64	21.79	22.13	22.04	20.75		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	21.09	0.41	20.49	21.17	21.26	21.43
1905	3	4	22.03	0.29	21.88	21.77	22.44	22.02
1906	3	4	21.33	0.23	21.54	21.08	21.19	21.50
1901	5	4	31.36	0.10	31.45	31.29	31.25	31.43
1902	5	4	22.05	0.28	22.22	21.90	21.72	22.34
1903	5	4	22.92	0.15	22.77	22.85	23.11	22.97
1904	5	4	23.61	0.23	23.32	23.60	23.68	23.86
1905	5	4	23.06	0.27	22.87	22.82	23.42	23.11
1906	5	4	24.29	0.15	24.12	24.31	24.23	24.49
1901	6	4	30.32	0.28	30.54	30.46	30.37	29.91
1902	6	4	22.36	0.34	22.48	22.46	22.64	21.87
1903	6	4	23.07	0.44	22.81	22.67	23.65	23.17
1904	6	4	24.11	0.57	23.30	24.26	24.65	24.21
1905	6	4	23.54	0.59	22.66	23.77	23.86	23.86
1906	6	4	23.76	0.23	23.49	23.67	23.84	24.04
1901	7	4	30.15	0.08	30.16	30.26	30.10	30.08
1902	7	4	21.84	0.24	22.18	21.62	21.81	21.75
1903	7	4	23.08	0.42	23.17	23.32	22.46	23.36
1904	7	4	23.36	0.38	23.82	23.52	23.14	22.97
1905	7	4	24.26	0.34	23.90	24.07	24.41	24.65
1906	7	4	23.45	0.23	23.20	23.38	23.75	23.50
1901	8	4	30.70	0.50	30.30	31.15	31.11	30.23
1902	8	4	21.87	0.20	21.62	21.83	21.96	22.09
1903	8	4	22.11	0.62	22.16	22.66	21.23	22.37
1904	8	4	23.76	0.47	23.31	23.48	24.38	23.85
1905	8	4	22.84	0.53	22.59	23.00	22.28	23.51
1906	8	4	22.83	0.20	23.06	22.82	22.88	22.57
1901	9	4	30.26	0.41	30.77	30.30	29.78	30.19
1902	9	4	22.18	0.07	22.25	22.08	22.18	22.21
1903	9	4	23.59	0.63	24.21	24.06	23.07	23.03
1904	9	4	21.91	0.82	20.74	22.60	21.98	22.33
1905	9	4	23.71	0.61	22.96	24.38	23.52	23.96
1906	9	4	24.84	0.37	24.45	25.27	24.99	24.65
1901	10	4	30.08	0.22	29.90	30.23	30.30	29.88
1902	10	4	21.96	0.21	21.95	22.22	21.96	21.70
1903	10	4	22.53	0.34	22.12	22.94	22.44	22.60
1904	10	4	23.16	0.20	22.87	23.32	23.19	23.24
1905	10	4	22.75	0.15	22.92	22.79	22.73	22.55
1906	10	4	22.54	0.44	22.51	23.18	22.19	22.29
1901	14	4	30.67	0.29	31.05	30.66	30.61	30.36
1902	14	4	21.47	0.21	21.23	21.70	21.58	21.37
1903	14	4	20.12b	1.48 c	19.85	19.25	19.09	22.28
1904	14	4	23.15	0.59	23.91	23.26	22.90	22.53
1905	14	4	22.99	0.65	22.64	23.84	22.37	23.11
1906	14	4	22.99	0.07	22.94	23.02	23.07	22.92
1901	15	4	30.40	0.30	30.08	30.42	30.31	30.79
1902	15	4	21.82	0.25	21.85	22.16	21.60	21.67
1903	15	4	22.28	0.53	22.54	21.79	21.88	22.89
1904	15	4	21.85	0.63	21.00	22.50	22.11	21.79
1905	15	4	22.36	0.78	22.59	21.69	21.79	23.37
1906	15	4	22.04	0.22	21.88	22.36	22.05	21.89
1901	16	4	29.52	0.48	28.87	29.68	30.01	29.51
1902	16	4	21.19	0.27	21.02	21.56	20.98	21.21

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	19.81b	0.58	19.19	19.46	20.39	20.21
1904	16	4	20.88	0.86	20.65	21.68	21.42	19.76
1905	16	4	21.30	1.62	20.81	22.72	19.24	22.44
1906	16	4	21.11	1.05	19.91	20.60	21.72	22.23
1901	17	4	29.61	0.34	30.06	29.70	29.34	29.36
1902	17	4	21.89	0.21	21.65	21.99	22.12	21.81
1903	17	4	21.46	0.32	21.86	21.38	21.52	21.08
1904	17	4	21.62	0.27	21.84	21.84	21.27	21.55
1905	17	4	22.61	0.23	22.92	22.38	22.52	22.61
1906	17	4	22.77	0.38	23.17	22.28	22.91	22.71
1901	18	4	29.85	0.53	29.93	29.27	30.53	29.66
1902	18	4	21.66	0.10	21.69	21.69	21.73	21.52
1903	18	4	22.70	0.18	22.73	22.51	22.62	22.93
1904	18	4	23.04	0.15	22.91	23.26	22.97	23.01
1905	18	4	24.58	0.78	25.68	24.52	24.25	23.88
1906	18	4	23.44	0.29	23.84	23.45	23.29	23.18
1901	19	4	29.75	0.57	29.72	29.15	30.53	29.59
1902	19	4	21.62	0.13	21.74	21.62	21.69	21.44
1903	19	4	22.62	0.17	22.75	22.43	22.55	22.77
1904	19	4	23.00	0.22	22.73	23.26	23.07	22.93
1905	19	4	24.59	0.82	25.75	24.56	24.18	23.89
1906	19	4	23.51	0.21	23.75	23.61	23.35	23.33
1901	20	4	29.48	0.75	29.62	28.54	30.37	29.41
1902	20	4	21.34	0.21	21.58	21.39	21.29	21.08
1903	20	4	22.33	0.19	22.11	22.43	22.23	22.54
1904	20	4	22.94	0.22	22.61	23.03	23.04	23.07
1905	20	4	24.39	0.83	25.42	24.68	23.85	23.60
1906	20	4	23.38	0.32	23.73	23.56	23.16	23.06
1901	22	4	31.44	0.31	31.69	31.00	31.64	31.43
1902	22	4	23.19	0.21	23.14	23.47	23.18	22.96
1903	22	4	22.88	0.37	22.41	22.91	23.32	22.87
1904	22	4	24.25	0.79	23.38	24.12	25.29	24.19
1905	22	4	23.74	0.40	23.85	23.52	24.24	23.34
1906	22	4	23.93	0.30	24.30	23.58	23.99	23.84
1901	23	4	31.00	0.13	30.91	31.16	30.88	31.03
1902	23	4	22.87	0.41	22.31	23.03	23.28	22.86
1903	23	4	23.71	0.32	23.26	24.00	23.86	23.70
1904	23	4	23.76	0.28	23.55	24.15	23.55	23.80
1905	23	4	24.50	0.73	24.91	24.88	24.80	23.40
1906	23	4	23.51	0.46	24.18	23.46	23.20	23.20
1901	24	4	30.39	0.29	30.12	30.21	30.78	30.45
1902	24	4	22.53	0.20	22.64	22.23	22.57	22.68
1903	24	4	22.55	0.38	22.69	22.04	22.93	22.55
1904	24	4	22.65	0.26	22.85	22.28	22.67	22.81
1905	24	4	22.72	0.33	22.23	22.88	22.88	22.89
1906	24	4	22.77	0.20	22.69	22.52	23.00	22.86
1901	25	4	30.82	0.47	30.63	30.52	30.62	31.52
1902	25	4	23.01	0.21	23.17	23.01	22.72	23.15
1903	25	4	22.53	0.86	23.65	22.10	22.70	21.67
1904	25	4	23.32	1.26	21.93	23.29	23.07	24.98
1905	25	4	22.32	0.70	23.18	22.59	21.79	21.73
1906	25	4	22.97	0.73	23.71	23.32	22.02	22.85
1901	26	4	31.74	1.06	30.50	31.80	31.57	33.09

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	23.20	0.69C	22.74	22.51	23.61	23.95
1903	26	4	23.48	1.05	24.27	23.61	24.07	21.96
1904	26	4	23.25	1.02	23.67	23.52	24.05	21.75
1905	26	4	24.24	1.59	22.47	26.33	24.12	24.04
1906	26	4	24.93	1.29	24.95	26.44	23.29	25.01
1901	27	4	30.80	0.50	30.47	30.32	31.39	31.02
1902	27	4	22.27	0.31	22.25	21.89	22.63	22.30
1903	27	4	22.90	0.24	23.17	22.95	22.90	22.59
1904	27	4	24.25	0.21	23.97	24.29	24.29	24.46
1905	27	4	23.73	1.08	22.55	23.10	24.83	24.45
1906	27	4	22.52	0.87	21.69	21.85	23.30	23.24
1901	29	4	27.19	0.31	27.06	27.18	26.88	27.62
1902	29	4	20.44	0.13	20.49	20.57	20.46	20.26
1903	29	4	20.74	0.43	20.41	21.05	20.33	21.17
1904	29	4	22.46	1.49	20.56	22.40	22.67	24.21
1905	29	4	20.83	1.36	19.59	22.08	19.71	21.94
1906	29	4	21.55	0.70	20.68	21.75	21.40	22.35
1901	30	4	31.47	0.10	31.60	31.34	31.47	31.47
1902	30	4	23.11	0.07	23.06	23.18	23.03	23.15
1905	30	4	26.11	0.23	26.42	25.88	26.01	26.12
1906	30	4	25.04	0.09	25.07	24.91	25.10	25.07
1901	31	4	30.46	0.56	30.27	29.76	30.74	31.05
1902	31	4	22.45	0.81C	23.29	21.43	22.19	22.87
1903	31	4	24.12	0.94	23.46	24.81	25.03	23.16
1904	31	4	23.12	0.18	23.17	23.07	22.92	23.34
1905	31	4	23.57	1.25	24.91	23.81	21.88	23.69
1906	31	4	23.21	0.71	24.20	22.58	22.85	23.21
1901	32	4	28.88	0.32	28.69	28.71	28.75	29.36
1902	32	4	20.85	0.49	21.46	20.48	20.44	21.03
1903	32	4	22.01	1.02	21.67	22.90	22.75	20.72
1904	32	4	21.45	0.25	21.11	21.41	21.59	21.69
1905	32	4	22.08	0.79	23.16	21.87	21.28	22.00
1906	32	4	21.86	0.77	22.98	21.21	21.55	21.69
1901	33	2	29.72	0.01	29.73	29.71		
1902	33	4	21.81	0.08	21.80	21.70	21.86	21.89
1903	33	4	21.36	1.07	22.74	20.15	21.39	21.17
1904	33	4	22.58	0.31	22.75	22.14	22.83	22.60
1905	33	4	22.25	0.98	21.13	23.24	22.89	21.75
1906	33	4	22.57	0.83	21.57	23.29	22.23	23.21
1901	34	2	30.87	1.98C	29.46	32.27		
1902	34	2	21.72	0.25	21.90	21.54		
1903	34	2	22.85	0.08	22.80	22.91		
1904	34	2	22.67	0.71	22.17	23.17		
1905	34	2	23.70	0.24	23.54	23.87		
1906	34	2	22.61	0.28	22.41	22.81		
1901	35	4	30.68	0.49	30.02	31.15	30.92	30.64
1902	35	4	22.85	0.45	23.14	22.23	23.20	22.81
1903	35	4	23.21	0.49	23.63	22.81	22.77	23.64
1904	35	4	23.38	0.27	23.60	23.00	23.37	23.55
1905	35	4	23.35	0.32	23.17	23.55	23.68	22.99
1906	35	4	24.16	0.58	24.76	23.64	23.68	24.55
1901	36	4	30.23	0.19	30.15	30.25	30.48	30.05
1902	36	4	21.44	0.06	21.41	21.44	21.39	21.52

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	21.95	0.79	22.06	20.92	22.01	22.83				
1904	36	4	22.74	0.70	23.40	21.79	23.11	22.67				
1905	36	4	23.60	0.52	24.33	23.44	23.54	23.10				
1906	36	4	23.32	0.40	23.56	22.89	23.75	23.09				
1901	37	6	33.28	0.94	34.35	33.63	33.34	34.03	31.95	32.36		
1902	37	6	22.18	0.33	22.58	22.21	22.46	22.05	21.66	22.12		
1903	37	6	22.21	0.63	23.14	21.76	21.72	22.61	21.55	22.47		
1904	37	6	22.48	1.64 c	23.00	25.17	21.12	23.25	21.34	20.98		
1905	37	6	21.97	1.50	20.34	22.22	19.99	23.46	23.47	22.35		
1906	37	6	24.48	1.37 c	27.21	24.09	24.09	24.26	23.67	23.54		
1901	38	4	30.30	0.84	29.57	31.44	30.42	29.79				
1902	38	4	23.09	0.22	23.18	22.77	23.12	23.30				
1903	38	4	22.47	0.42	22.00	22.45	22.39	23.02				
1904	38	4	22.38	0.34	22.03	22.34	22.84	22.30				
1905	38	4	22.63	0.17	22.43	22.55	22.75	22.78				
1906	38	4	21.91	1.00	22.23	22.92	20.53	21.96				
1901	39	11	29.36	0.36	28.82	29.51	28.89	29.75	29.25	29.67	29.05	29.7
1902	39	11	21.46	0.11	21.27	21.33	21.48	21.37	21.64	21.52	21.41	21.4
1903	39	10	22.79	0.23	23.00	22.44	23.05	22.58	22.98	22.55	23.00	22.6
1904	39	9	22.87	0.36	23.15	22.26	23.11	22.64	23.26	23.14	22.57	23.1
1905	39	10	24.20	0.27	24.34	24.06	24.37	23.71	24.38	23.85	24.38	24.2
1906	39	10	22.69	0.10	22.50	22.62	22.78	22.60	22.76	22.81	22.69	22.6
1901	106	4	30.52	0.28	30.24	30.34	30.76	30.76				
1902	106	4	22.93	0.03	22.98	22.91	22.91	22.94				
1903	106	4	23.91	0.33	23.48	23.80	24.17	24.18				
1904	106	4	25.01	0.28	24.90	25.15	25.30	24.67				
1905	106	4	24.08	0.12	24.08	23.91	24.16	24.16				
1906	106	4	25.46	0.10	25.58	25.47	25.46	25.34				
1901	134	3	31.80	0.33	31.58	32.18	31.65					
1902	134	6	23.31	0.26	23.73	23.46	23.36	23.08	23.05	23.17		
1903	134	4	24.37	0.54	24.44	24.53	24.89	23.62				
1904	134	4	24.01	0.67	23.27	23.65	24.37	24.74				
1905	134	4	25.17	0.79	24.42	24.56	25.77	25.93				
1906	134	4	23.84	0.86	23.24	23.23	23.85	25.05				
1901	139	11	28.68	0.34	28.09	28.95	28.39	28.50	28.97	28.42	28.89	28.5
1902	139	11	20.78	0.06	20.75	20.66	20.80	20.82	20.83	20.81	20.79	20.7
1903	139	10	22.09	0.25	21.77	22.40	21.85	22.17	21.86	22.39	21.93	22.3
1904	139	10	22.18	0.33	21.86	22.45	21.83	22.28	21.92	22.47	21.69	22.4
1905	139	10	23.55	0.30	23.09	23.73	23.32	23.79	23.32	23.66	23.55	23.7
1906	139	10	21.98	0.17	21.99	21.86	22.07	21.70	22.12	21.85	22.26	21.8

18.9 ADL

18.9.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	0.37	0.16	0.02	0.10	0.04	0.11
3	0.24	0.79	0.62	0.84	0.77	0.62
5	-0.49	-0.90	-0.46	-0.77	-0.57	-0.53
6	-0.47	-0.88	-0.74	-0.70	-0.94	-0.79
7	-1.35	-1.23	-0.95	-0.87	-1.35	-0.99
8	0.30	0.16	-0.41	-0.04	-0.04	-0.12
9	-0.93	-1.08	-0.47	0.08	-0.14	0.26
10	-0.20	-0.16	-0.00	0.17	-0.07	-0.13
14	0.05	0.69	0.41	0.30	0.36	-0.15
15	-0.51	-0.81	-0.38	-0.46	-0.58	-0.78
16	0.20	-0.24	-0.23	-0.35	0.07	-0.26
17	-0.33	-0.58	-0.47	-0.83	-1.07	-1.06
18	-0.12	-0.25	-0.28	-0.38	-0.25	-0.25
19	-0.65	-0.58	-0.70	-0.49	-0.30	-0.32
20	-0.04	-0.33	-0.49	-0.30	-0.15	0.02
22	1.42	2.34	1.70	1.57	1.59	1.52
23	-1.23	-1.31	-0.55	-0.82	-0.89	-0.57
24	-0.78	-1.10	0.01	-0.32	-0.19	-0.43
25	0.38	0.24	-0.10	-0.37	-0.02	-0.08
26	-1.62	-0.14	-1.78	-1.26	-0.41	-0.62
27	-0.38	-0.49	0.02	0.14	-0.13	-0.43
29	1.00	1.70	1.45	1.79	1.31	1.40
30	1.68	1.76			1.65	1.25
31	-0.55	-0.54	-0.19	-0.61	-0.64	-0.58
32	0.33	0.86	0.67	0.60	0.31	0.01
33	6.34	9.53	6.40	6.77	6.30	5.79
34	0.11	-0.09	-0.36	0.05	-0.48	-0.25
35	-1.07	-1.22	-0.71	-0.68	-0.81	-0.38
36	-0.33	-0.92	-0.13	-0.33	-0.20	-0.09
37	3.00	0.05	3.47	3.25	3.17	3.68
38	-0.18	-0.06	0.26	-0.32	-0.44	-0.74
39	0.37	0.94	0.01	0.06	-0.06	0.03
106	0.85	1.37	0.51	0.38	0.10	0.19
134	0.71	1.54	0.61	0.89	0.94	0.78
139	0.24	0.31	-0.38	-0.31	-0.60	-0.33

18.9.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	2.45	0.04	2.44	2.42	2.53	2.45	2.42	2.45
1902	1	6	1.43	0.04	1.44	1.43	1.43	1.39	1.50	1.41
1903	1	6	1.80	0.06	1.78	1.78	1.86	1.88	1.73	1.78
1904	1	6	1.79	0.09	1.80	1.93	1.67	1.79	1.73	1.81
1905	1	6	1.91	0.11	1.75	2.03	1.95	1.83	1.88	2.04
1906	1	6	1.66	0.05	1.67	1.74	1.66	1.59	1.65	1.62
1901	3	4	2.42	0.07	2.44	2.33	2.50	2.40		
1902	3	4	1.55	0.09	1.66	1.50	1.47	1.57		
1903	3	4	1.94	0.06	1.96	2.01	1.87	1.94		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	1.97	0.04	1.92	2.03	1.96	1.95
1905	3	4	2.09	0.05	2.14	2.06	2.03	2.13
1906	3	4	1.79	0.04	1.85	1.80	1.78	1.75
1901	5	4	2.21	0.07	2.19	2.30	2.15	2.22
1902	5	4	1.24	0.05	1.25	1.29	1.24	1.17
1903	5	4	1.68	0.05	1.62	1.67	1.70	1.73
1904	5	4	1.58	0.07	1.66	1.50	1.58	1.56
1905	5	4	1.76	0.06	1.85	1.70	1.75	1.75
1906	5	4	1.48	0.03	1.48	1.47	1.46	1.52
1901	6	4	2.22	0.06	2.15	2.25	2.29	2.18
1902	6	4	1.24	0.05	1.25	1.29	1.17	1.25
1903	6	4	1.61	0.06	1.56	1.68	1.65	1.56
1904	6	4	1.59	0.06	1.61	1.51	1.59	1.66
1905	6	4	1.67	0.11	1.68	1.51	1.76	1.74
1906	6	4	1.41	0.11	1.31	1.54	1.46	1.34
1901	7	4	1.98	0.10	1.89	1.94	2.13	1.94
1902	7	4	1.17	0.09	1.25	1.05	1.16	1.24
1903	7	4	1.56	0.19 c	1.74	1.44	1.70	1.36
1904	7	4	1.56	0.07	1.61	1.61	1.47	1.53
1905	7	4	1.57	0.09	1.61	1.45	1.58	1.65
1906	7	4	1.36	0.05	1.40	1.33	1.31	1.40
1901	8	4	2.43	0.06	2.44	2.36	2.43	2.50
1902	8	4	1.43	0.08	1.33	1.52	1.44	1.45
1903	8	4	1.69	0.09	1.56	1.74	1.75	1.73
1904	8	4	1.75	0.10	1.88	1.67	1.68	1.78
1905	8	4	1.89	0.08	1.92	1.80	1.99	1.86
1906	8	4	1.59	0.08	1.50	1.63	1.56	1.68
1901	9	4	2.09	0.09	2.08	2.01	2.06	2.22
1902	9	4	1.20	0.11	1.28	1.07	1.17	1.29
1903	9	4	1.68	0.07	1.69	1.58	1.69	1.74
1904	9	4	1.78	0.11	1.81	1.63	1.86	1.83
1905	9	4	1.87	0.07	1.83	1.79	1.89	1.96
1906	9	4	1.69	0.06	1.76	1.69	1.72	1.61
1901	10	4	2.29	0.07	2.32	2.23	2.37	2.25
1902	10	4	1.37	0.03	1.40	1.33	1.37	1.39
1903	10	4	1.79	0.04	1.77	1.83	1.82	1.75
1904	10	4	1.81	0.06	1.82	1.72	1.80	1.87
1905	10	4	1.89	0.14	1.70	1.91	1.92	2.02
1906	10	4	1.59	0.05	1.59	1.52	1.61	1.65
1901	14	4	2.36	0.03	2.39	2.35	2.38	2.33
1902	14	4	1.53	0.04	1.51	1.51	1.53	1.59
1903	14	4	1.89	0.03	1.86	1.88	1.90	1.94
1904	14	4	1.84	0.06	1.85	1.80	1.91	1.79
1905	14	4	1.99	0.02	2.02	2.01	1.97	1.97
1906	14	4	1.58	0.05	1.55	1.65	1.54	1.59
1901	15	4	2.21	0.03	2.18	2.23	2.24	2.18
1902	15	4	1.25	0.05	1.33	1.25	1.22	1.21
1903	15	4	1.70	0.02	1.73	1.70	1.69	1.67
1904	15	4	1.65	0.07	1.70	1.71	1.57	1.63
1905	15	4	1.76	0.07	1.67	1.79	1.84	1.75
1906	15	4	1.41	0.05	1.36	1.48	1.42	1.40
1901	16	4	2.40	0.09	2.35	2.31	2.51	2.44
1902	16	4	1.36	0.06	1.39	1.41	1.37	1.28

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	1.74	0.11	1.63	1.89	1.71	1.72
1904	16	4	1.68	0.10	1.81	1.60	1.61	1.70
1905	16	4	1.92	0.10	1.77	1.98	1.99	1.95
1906	16	4	1.55	0.05	1.54	1.58	1.61	1.49
1901	17	4	2.26	0.08	2.21	2.36	2.18	2.28
1902	17	4	1.30	0.07	1.32	1.34	1.33	1.19
1903	17	4	1.68	0.05	1.61	1.68	1.72	1.70
1904	17	4	1.56	0.04	1.61	1.52	1.55	1.57
1905	17	4	1.64	0.08	1.63	1.54	1.69	1.71
1906	17	4	1.34	0.06	1.30	1.43	1.29	1.33
1901	18	4	2.31	0.02	2.32	2.28	2.34	2.31
1902	18	4	1.36	0.02	1.33	1.36	1.39	1.35
1903	18	4	1.73	0.04	1.68	1.78	1.71	1.73
1904	18	4	1.67	0.01	1.69	1.66	1.66	1.68
1905	18	4	1.84	0.06	1.90	1.87	1.82	1.76
1906	18	4	1.56	0.02	1.52	1.56	1.57	1.58
1901	19	4	2.17	0.04	2.18	2.12	2.21	2.16
1902	19	4	1.30	0.03	1.30	1.30	1.32	1.26
1903	19	4	1.62	0.05	1.62	1.68	1.62	1.57
1904	19	4	1.64	0.04	1.59	1.65	1.69	1.65
1905	19	4	1.83	0.06	1.92	1.83	1.81	1.76
1906	19	4	1.54	0.03	1.50	1.56	1.55	1.55
1901	20	4	2.34	0.09	2.36	2.23	2.44	2.31
1902	20	4	1.34	0.01	1.36	1.35	1.33	1.33
1903	20	4	1.67	0.05	1.62	1.72	1.66	1.70
1904	20	4	1.69	0.04	1.69	1.64	1.72	1.72
1905	20	4	1.87	0.07	1.93	1.91	1.83	1.79
1906	20	4	1.63	0.04	1.58	1.62	1.64	1.67
1901	22	4	2.74	0.07	2.78	2.67	2.69	2.82
1902	22	4	1.84	0.05	1.80	1.89	1.78	1.89
1903	22	4	2.21	0.06	2.12	2.22	2.27	2.22
1904	22	4	2.14	0.13	2.04	2.07	2.33	2.14
1905	22	4	2.29	0.10	2.22	2.19	2.40	2.36
1906	22	4	2.03	0.09	2.04	2.00	2.15	1.94
1901	23	4	2.01	0.04	1.97	1.99	2.00	2.07
1902	23	4	1.16	0.06	1.23	1.09	1.14	1.17
1903	23	4	1.66	0.06	1.67	1.60	1.73	1.64
1904	23	4	1.57	0.05	1.60	1.50	1.55	1.61
1905	23	4	1.68	0.07	1.79	1.66	1.64	1.65
1906	23	4	1.47	0.07	1.40	1.52	1.43	1.54
1901	24	4	2.13	0.08	2.25	2.12	2.04	2.13
1902	24	4	1.20	0.03	1.21	1.24	1.18	1.18
1903	24	4	1.80	0.08	1.76	1.88	1.84	1.71
1904	24	4	1.69	0.07	1.71	1.72	1.74	1.59
1905	24	4	1.86	0.08	1.88	1.75	1.94	1.86
1906	24	4	1.51	0.05	1.52	1.55	1.44	1.51
1901	25	4	2.45	0.02	2.44	2.44	2.46	2.47
1902	25	4	1.45	0.01	1.46	1.43	1.46	1.45
1903	25	4	1.77	0.15	1.95	1.77	1.76	1.59
1904	25	4	1.67	0.07	1.66	1.66	1.77	1.60
1905	25	4	1.90	0.07	1.87	1.83	1.91	1.99
1906	25	4	1.60	0.08	1.61	1.51	1.58	1.71
1901	26	4	1.90	0.27C	1.86	1.75	1.70	2.29

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	1.38	0.21C	1.30	1.14	1.45	1.63
1903	26	4	1.36	0.15	1.47	1.33	1.48	1.16
1904	26	4	1.46	0.20	1.57	1.36	1.68	1.23
1905	26	4	1.80	0.19	1.60	2.06	1.78	1.77
1906	26	4	1.46	0.20C	1.18	1.61	1.43	1.61
1901	27	4	2.24	0.06	2.20	2.29	2.19	2.30
1902	27	4	1.31	0.10	1.30	1.40	1.18	1.37
1903	27	4	1.80	0.09	1.91	1.76	1.70	1.82
1904	27	4	1.80	0.06	1.83	1.79	1.85	1.72
1905	27	4	1.87	0.20	1.86	1.76	1.70	2.16
1906	27	4	1.51	0.07	1.45	1.45	1.54	1.60
1901	29	4	2.63	0.06	2.56	2.63	2.62	2.70
1902	29	4	1.72	0.05	1.75	1.78	1.67	1.69
1903	29	4	2.15	0.06	2.06	2.17	2.21	2.14
1904	29	4	2.20	0.14	2.07	2.08	2.32	2.31
1905	29	4	2.23	0.08	2.23	2.19	2.34	2.14
1906	29	4	2.00	0.19	2.09	1.79	1.91	2.23
1901	30	4	2.81	0.02	2.82	2.81	2.84	2.79
1902	30	4	1.73	0.02	1.75	1.75	1.73	1.71
1905	30	4	2.31	0.03	2.31	2.32	2.27	2.33
1906	30	4	1.96	0.04	2.02	1.95	1.93	1.95
1901	31	4	2.20	0.23	2.05	2.52	2.02	2.19
1902	31	4	1.30	0.14C	1.22	1.51	1.25	1.23
1903	31	4	1.75	0.08	1.84	1.68	1.78	1.69
1904	31	4	1.62	0.13	1.46	1.62	1.77	1.61
1905	31	4	1.75	0.06	1.74	1.73	1.69	1.83
1906	31	4	1.47	0.11	1.43	1.38	1.44	1.62
1901	32	4	2.44	0.06	2.41	2.40	2.42	2.52
1902	32	4	1.56	0.04	1.57	1.62	1.52	1.54
1903	32	4	1.96	0.07	1.90	2.05	1.97	1.90
1904	32	4	1.91	0.06	1.93	1.93	1.82	1.95
1905	32	4	1.98	0.07	1.96	2.06	1.89	2.01
1906	32	4	1.63	0.12	1.57	1.73	1.49	1.73
1901	33	0	4.10B	0.10	4.03	4.17		
1902	33	0	3.18B	0.05	3.15	3.24	3.18	3.14
1903	33	0	3.36B	0.13	3.55	3.31	3.24	3.33
1904	33	0	3.40B	0.08	3.43	3.49	3.36	3.31
1905	33	0	3.45B	0.06	3.53	3.40	3.44	3.42
1906	33	0	3.19B	0.09	3.14	3.23	3.09	3.29
1901	34	2	2.38	0.14	2.28	2.48		
1902	34	2	1.39	0.04	1.36	1.42		
1903	34	2	1.71	0.13	1.61	1.80		
1904	34	2	1.78	0.24 c	1.95	1.61		
1905	34	2	1.78	0.26C	1.97	1.60		
1906	34	2	1.56	0.26C	1.37	1.74		
1901	35	4	2.05	0.08	2.17	2.00	2.00	2.04
1902	35	4	1.18	0.07	1.13	1.28	1.15	1.15
1903	35	4	1.62	0.09	1.65	1.62	1.50	1.70
1904	35	4	1.60	0.07	1.60	1.67	1.62	1.51
1905	35	4	1.71	0.12	1.53	1.74	1.81	1.74
1906	35	4	1.52	0.04	1.48	1.51	1.57	1.53
1901	36	4	2.26	0.04	2.28	2.20	2.25	2.29
1902	36	4	1.23	0.09	1.11	1.23	1.31	1.27

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values								
1903	36	4	1.76	0.05	1.83	1.70	1.76	1.75					
1904	36	4	1.68	0.07	1.61	1.76	1.72	1.65					
1905	36	4	1.85	0.08	1.87	1.74	1.92	1.89					
1906	36	4	1.60	0.04	1.66	1.58	1.59	1.57					
1901	37	6	3.18B	0.12	3.33	3.17	3.21	3.26	3.07	3.02			
1902	37	6	1.41	0.05	1.50	1.39	1.41	1.42	1.40	1.35			
1903	37	6	2.64B	0.10	2.63	2.57	2.59	2.76	2.76	2.52			
1904	37	6	2.55B	0.22	2.73	2.76	2.52	2.50	2.62	2.16			
1905	37	6	2.68B	0.14	2.69	2.53	2.54	2.86	2.84	2.62			
1906	37	6	2.62B	0.13	2.77	2.50	2.69	2.74	2.46	2.54			
1901	38	4	2.30	0.10	2.26	2.43	2.32	2.18					
1902	38	4	1.39	0.11	1.49	1.37	1.25	1.45					
1903	38	4	1.86	0.07	1.95	1.84	1.79	1.85					
1904	38	4	1.69	0.11	1.72	1.81	1.67	1.56					
1905	38	4	1.80	0.06	1.73	1.85	1.75	1.85					
1906	38	4	1.42	0.15	1.35	1.60	1.27	1.48					
1901	39	12	2.45	0.23C	2.47	2.46	2.50	2.56	2.49	2.59	2.48	2.54	2.54
1902	39	11	1.58	0.03	1.60	1.52	1.56	1.57	1.60	1.61	1.53	1.59	1.56
1903	39	10	1.79	0.03	1.78	1.80	1.82	1.82	1.80	1.81	1.78	1.82	1.72
1904	39	9	1.78	0.04	1.80	1.70	1.78	1.78	1.75	1.81	1.81	1.80	1.77
1905	39	10	1.89	0.06	1.97	1.91	1.93	1.87	1.93	1.80	1.90	1.83	1.96
1906	39	10	1.63	0.04	1.56	1.58	1.67	1.64	1.65	1.63	1.63	1.63	1.71
1901	106	4	2.58	0.07	2.50	2.55	2.65	2.63					
1902	106	4	1.66	0.03	1.64	1.62	1.70	1.67					
1903	106	4	1.92	0.11	1.87	1.80	1.95	2.06					
1904	106	4	1.86	0.07	1.86	1.77	1.86	1.94					
1905	106	4	1.93	0.06	1.91	1.90	1.90	2.02					
1906	106	4	1.68	0.07	1.62	1.70	1.77	1.61					
1901	134	3	2.54	0.14	2.60	2.38	2.65						
1902	134	6	1.69	0.06	1.73	1.68	1.72	1.57	1.75	1.70			
1903	134	4	1.94	0.07	1.96	1.84	2.01	1.96					
1904	134	4	1.98	0.15	2.10	2.10	1.80	1.91					
1905	134	4	2.13	0.18	2.34	2.20	2.06	1.93					
1906	134	4	1.84	0.06	1.79	1.78	1.92	1.86					
1901	139	11	2.41	0.05	2.40	2.46	2.33	2.36	2.46	2.37	2.41	2.38	2.49
1902	139	11	1.46	0.05	1.48	1.40	1.44	1.45	1.48	1.38	1.47	1.52	1.46
1903	139	10	1.70	0.05	1.68	1.61	1.78	1.68	1.76	1.74	1.72	1.66	1.70
1904	139	10	1.69	0.04	1.68	1.72	1.61	1.73	1.70	1.68	1.64	1.69	1.74
1905	139	10	1.76	0.06	1.71	1.84	1.72	1.80	1.70	1.81	1.75	1.78	1.66
1906	139	10	1.54	0.03	1.55	1.55	1.53	1.55	1.54	1.56	1.51	1.52	1.58

18.10 NDF

18.10.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	-0.08	0.27	0.29	0.32	0.05	0.35
3	-1.30	-1.12	-0.30	-1.00	-0.29	-0.87
5	1.31	0.22	0.56	0.71	0.24	1.49
6	0.05	0.14	0.27	0.79	0.34	0.63
7	0.76	0.13	0.59	0.57	1.12	0.71
8	0.62	-0.37	-0.65	0.48	-0.45	-0.51
9	0.51	0.16	0.99	-0.52	0.71	1.70
10	-0.03	0.03	0.06	0.20	-0.13	-0.23
14	0.39	-0.32	-1.46	0.26	0.01	0.02
15	0.47	0.05	-0.04	-0.74	-0.44	-0.66
16	0.24	0.28	-1.19	-0.91	-0.61	-0.80
17	-0.09	-0.09	-0.84	-1.11	-0.51	-0.47
18	0.02	0.24	0.38	0.54	1.60	0.96
19	0.08	0.27	0.48	0.50	1.58	0.99
20	-0.17	0.09	0.33	0.54	1.43	0.87
22	-3.15	-3.12	-3.60	-2.66	-3.19	-3.12
23	0.62	0.49	0.96	0.75	1.05	0.46
24	0.13	0.15	0.02	-0.24	-0.20	-0.26
25	0.63	0.69	-0.04	0.20	-0.50	0.13
26	0.83	0.39	0.44	-0.34	0.34	1.06
27	0.52	0.03	0.02	1.02	0.24	-0.45
29	-1.60	-0.97	-1.24	-0.08	-1.50	-1.15
30	-2.86	-3.34			-1.46	-2.31
31	0.09	0.16	0.99	-0.30	0.22	0.09
32	-0.37	-0.70	-0.17	-1.02	-0.85	-1.17
33	0.85	0.73	-0.28	0.29	-0.08	0.68
34	0.54	0.07	0.53	0.05	1.02	0.38
35	0.42	0.57	0.73	0.51	0.55	1.56
36	0.66	-0.26	-0.41	0.16	0.51	0.70
37	2.62	0.48	0.06	-0.14	-0.72	1.44
38	0.50	1.33	0.30	-0.15	0.31	-0.77
39	-0.41	-0.32	0.49	0.31	1.34	0.13
106	-0.09	1.20	0.78	1.39	-0.21	2.14
134	-2.52	-3.04	-2.40	-3.21	-2.17	-3.03
139	-0.67	-0.98	-0.25	-0.36	0.63	-0.70

18.10.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	54.68	0.47	54.14	55.02	55.10	54.89	54.01	54.91
1902	1	6	42.08	0.35	41.73	42.09	42.40	41.61	42.14	42.51
1903	1	6	43.81	0.96	43.92	42.77	42.80	45.17	44.57	43.61
1904	1	6	45.55	1.99	45.37	48.16	42.42	44.40	46.56	46.40
1905	1	6	43.85	1.39	42.13	42.64	43.65	45.65	45.23	43.81
1906	1	6	43.36	0.68	43.23	42.19	43.90	43.73	44.03	43.09
1901	3	4	52.54	0.59	52.39	52.30	53.40	52.07		
1902	3	4	39.65	0.30	39.91	39.32	39.47	39.88		
1903	3	4	42.77	0.96	42.99	43.78	42.83	41.47		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	43.24	1.04	41.96	42.92	44.35	43.74
1905	3	4	43.27	0.41	43.13	43.03	43.89	43.03
1906	3	4	41.21	0.53	41.67	41.06	40.54	41.59
1901	5	4	57.11	0.07	57.01	57.15	57.17	57.10
1902	5	4	41.98	0.21	42.09	41.78	41.84	42.22
1903	5	4	44.28	0.14	44.09	44.28	44.34	44.41
1904	5	4	46.24	0.29	46.13	45.89	46.38	46.56
1905	5	4	44.18	0.25	43.90	44.06	44.49	44.27
1906	5	4	45.35	0.40	45.06	45.22	45.17	45.94
1901	6	4	54.90	0.38	55.28	54.98	54.96	54.38
1902	6	4	41.85	0.42	41.97	42.09	42.11	41.22
1903	6	4	43.76	0.64	43.29	43.47	44.71	43.57
1904	6	4	46.37	0.88	45.08	46.82	46.98	46.61
1905	6	4	44.36	0.62	43.43	44.59	44.78	44.62
1906	6	4	43.85	0.38	43.29	44.02	43.96	44.13
1901	7	4	56.15	0.21	56.00	56.41	55.96	56.23
1902	7	4	41.84	0.22	42.15	41.67	41.68	41.84
1903	7	4	44.32	0.39	44.38	44.61	43.76	44.55
1904	7	4	46.00	0.51	46.64	46.13	45.44	45.80
1905	7	4	45.72	0.49	45.24	45.39	45.97	46.29
1906	7	4	43.98	0.36	43.45	44.20	44.12	44.14
1901	8	4	55.90	0.76	55.63	56.44	56.59	54.95
1902	8	4	40.95	0.19	41.05	40.86	40.73	41.14
1903	8	4	42.16	0.58	41.80	42.85	41.57	42.40
1904	8	4	45.84	0.57	45.35	45.36	46.44	46.20
1905	8	4	42.99	0.88	42.21	43.44	42.31	44.00
1906	8	4	41.86	0.06	41.82	41.82	41.84	41.95
1901	9	4	55.71	0.30	56.12	55.72	55.41	55.59
1902	9	4	41.88	0.37	41.94	41.51	41.70	42.37
1903	9	4	45.02	0.86	45.83	45.67	44.46	44.12
1904	9	4	44.08	1.18	42.40	45.15	44.34	44.43
1905	9	4	45.01	1.07	43.91	46.30	44.38	45.45
1906	9	4	45.71	0.32	45.44	46.16	45.72	45.52
1901	10	4	54.76	0.27	54.60	54.55	55.15	54.72
1902	10	4	41.65	0.35	41.83	42.05	41.49	41.25
1903	10	4	43.39	0.49	42.69	43.80	43.46	43.64
1904	10	4	45.35	0.42	44.85	45.64	45.16	45.75
1905	10	4	43.55	0.21	43.49	43.56	43.82	43.31
1906	10	4	42.34	0.54	42.10	43.14	42.00	42.10
1901	14	4	55.49	0.32	55.92	55.48	55.40	55.17
1902	14	4	41.04	0.26	40.70	41.33	41.10	41.03
1903	14	4	40.75	1.91	40.58	39.92	39.04	43.44
1904	14	4	45.45	0.62	46.36	45.20	45.29	44.96
1905	14	4	43.79	0.54	43.66	44.41	43.13	43.95
1906	14	4	42.79	0.14	42.61	42.94	42.77	42.84
1901	15	4	55.64	0.41	55.29	55.47	55.58	56.23
1902	15	4	41.69	0.57	41.69	42.29	41.85	40.92
1903	15	4	43.21	0.52	43.63	42.65	42.90	43.68
1904	15	4	43.70	0.77	42.56	44.26	43.93	44.03
1905	15	4	43.00	1.08	43.53	42.09	42.10	44.27
1906	15	4	41.58	0.28	41.25	41.84	41.79	41.45
1901	16	4	55.24	0.47	54.67	55.46	55.74	55.07
1902	16	4	42.10	0.33	41.83	42.57	42.03	41.97

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	41.21	1.05	40.20	40.43	42.35	41.84
1904	16	4	43.41	1.43	43.00	44.56	44.49	41.56
1905	16	4	42.71	1.75	41.88	44.24	40.64	44.07
1906	16	4	41.34	1.26	40.14	40.37	42.47	42.39
1901	17	4	54.66	0.48	55.22	54.75	54.06	54.60
1902	17	4	41.44	0.27	41.04	41.59	41.60	41.52
1903	17	4	41.83	0.44	42.43	41.59	41.86	41.41
1904	17	4	43.06	0.26	43.15	43.33	42.70	43.03
1905	17	4	42.87	0.41	43.25	43.20	42.46	42.58
1906	17	4	41.92	0.60	42.47	41.07	42.16	42.00
1901	18	4	54.85	0.73	54.91	54.06	55.81	54.64
1902	18	4	42.02	0.24	42.18	41.90	42.25	41.75
1903	18	4	43.96	0.15	43.98	43.78	43.93	44.15
1904	18	4	45.94	0.40	45.50	46.45	45.98	45.82
1905	18	4	46.56	1.03	48.06	46.30	46.14	45.75
1906	18	4	44.43	0.40	45.00	44.42	44.17	44.13
1901	19	4	54.95	0.62	54.97	54.23	55.74	54.84
1902	19	4	42.07	0.21	42.20	41.93	42.29	41.86
1903	19	4	44.14	0.10	44.24	43.99	44.16	44.15
1904	19	4	45.88	0.36	45.45	46.29	46.02	45.74
1905	19	4	46.54	0.94	47.90	46.42	46.02	45.83
1906	19	4	44.47	0.31	44.89	44.52	44.30	44.18
1901	20	4	54.51	1.01	54.75	53.20	55.65	54.44
1902	20	4	41.76	0.40	42.23	41.78	41.77	41.27
1903	20	4	43.87	0.21	43.57	43.98	43.90	44.05
1904	20	4	45.93	0.37	45.44	46.34	45.96	46.00
1905	20	4	46.27	1.07	47.64	46.57	45.58	45.28
1906	20	4	44.27	0.58	45.02	44.41	43.92	43.72
1901	22	4	49.31 b	0.36	49.77	48.98	49.41	49.07
1902	22	0	36.15B	0.52	36.06	36.61	36.47	35.45
1903	22	0	36.99B	0.33	36.67	37.41	37.07	36.79
1904	22	4	40.34B	1.05	39.21	40.21	41.76	40.19
1905	22	4	38.19 b	0.60	38.36	38.10	38.86	37.42
1906	22	4	37.29	0.55	37.71	36.75	37.81	36.89
1901	23	4	55.90	0.25	55.56	56.05	56.11	55.85
1902	23	4	42.45	0.38	41.91	42.65	42.78	42.47
1903	23	4	44.98	0.44	44.53	45.14	45.52	44.72
1904	23	4	46.31	0.19	46.18	46.57	46.16	46.35
1905	23	4	45.60	0.99	46.16	46.14	46.00	44.12
1906	23	4	43.55	0.63	44.45	43.52	43.10	43.12
1901	24	4	55.04	0.15	54.97	54.86	55.15	55.19
1902	24	4	41.87	0.21	42.15	41.80	41.64	41.90
1903	24	4	43.33	0.38	43.55	42.90	43.73	43.13
1904	24	4	44.58	0.25	44.81	44.25	44.51	44.75
1905	24	4	43.42	0.44	43.19	43.60	42.95	43.94
1906	24	4	42.28	0.27	42.22	41.92	42.53	42.45
1901	25	4	55.92	0.60	55.66	55.71	55.51	56.81
1902	25	4	42.81	0.28	42.90	43.13	42.46	42.75
1903	25	4	43.22	1.22	44.75	42.95	43.39	41.79
1904	25	4	45.35	1.93	43.57	45.29	44.49	48.04
1905	25	4	42.90	0.73	43.83	43.12	42.34	42.30
1906	25	4	42.97	1.04	43.95	43.50	41.56	42.85
1901	26	4	56.27	2.10C	53.69	56.64	55.96	58.78

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	42.28	1.62C	41.80	40.48	42.48	44.37
1903	26	4	44.07	2.04 c	45.54	44.70	44.98	41.05
1904	26	4	44.40	1.02	43.78	45.80	44.49	43.54
1905	26	4	44.37	2.41 c	41.32	46.93	45.45	43.79
1906	26	4	44.60	2.70C	44.15	47.14	41.00	46.10
1901	27	4	55.72	0.66	55.48	55.05	56.62	55.74
1902	27	4	41.66	0.46	41.60	41.11	42.23	41.68
1903	27	4	43.33	0.62	43.87	43.28	43.67	42.47
1904	27	4	46.77	0.10	46.70	46.93	46.74	46.73
1905	27	4	44.19	1.55	42.51	43.35	45.94	44.94
1906	27	4	41.96	0.93	40.80	41.66	42.46	42.92
1901	29	4	52.02	0.64	52.52	51.29	51.68	52.60
1902	29	4	39.91	0.39	39.82	39.40	40.12	40.30
1903	29	4	41.13	0.61	40.38	41.71	40.88	41.53
1904	29	4	44.85	2.29	42.34	44.74	44.41	47.90
1905	29	4	41.14	2.26	40.09	43.77	38.61	42.08
1906	29	4	40.73	1.70	38.57	41.23	40.47	42.66
1901	30	4	49.81 b	0.19	49.88	49.62	49.71	50.04
1902	30	0	35.75B	0.18	35.72	35.63	35.65	36.02
1905	30	4	41.22	0.29	41.59	41.03	40.95	41.32
1906	30	4	38.71	0.08	38.75	38.64	38.80	38.64
1901	31	4	54.97	0.46	54.76	54.56	54.95	55.63
1902	31	4	41.89	0.64	42.36	41.60	41.13	42.47
1903	31	4	45.02	1.32	43.84	46.11	46.21	43.91
1904	31	4	44.47	0.56	43.84	44.20	44.71	45.12
1905	31	4	44.15	0.87	45.28	44.09	43.16	44.06
1906	31	4	42.90	0.69	43.88	42.43	42.38	42.91
1901	32	4	54.16	0.45	54.15	54.02	53.72	54.77
1902	32	4	40.38	0.77	40.93	40.55	39.24	40.79
1903	32	4	42.99	1.36	42.14	44.38	43.89	41.56
1904	32	4	43.21	0.35	43.05	42.84	43.27	43.66
1905	32	4	42.28	1.08	43.78	42.08	41.20	42.08
1906	32	4	40.70	1.59	42.75	40.49	38.88	40.69
1901	33	2	56.31	0.03	56.33	56.28		
1902	33	4	42.88	0.12	42.72	42.97	42.86	42.97
1903	33	4	42.80	1.44	44.64	41.13	42.84	42.59
1904	33	4	45.50	0.38	45.95	45.68	45.21	45.17
1905	33	4	43.64	1.45	41.81	44.93	44.66	43.15
1906	33	4	43.93	1.10	42.80	44.43	43.28	45.23
1901	34	2	55.76	2.03	54.32	57.20		
1902	34	2	41.72	0.54	42.10	41.34		
1903	34	2	44.23	0.80	44.79	43.66		
1904	34	2	45.08	1.45	44.05	46.10		
1905	34	2	45.56	0.37	45.29	45.82		
1906	34	2	43.41	0.95	42.74	44.08		
1901	35	4	55.55	0.57	55.27	55.98	56.05	54.88
1902	35	4	42.60	0.55	43.41	42.22	42.48	42.30
1903	35	4	44.57	0.49	44.93	44.31	44.01	45.02
1904	35	4	45.89	0.59	46.30	45.01	46.08	46.16
1905	35	4	44.74	0.59	44.38	45.06	45.38	44.12
1906	35	4	45.47	0.58	46.10	45.23	44.79	45.75
1901	36	4	55.96	0.34	56.31	55.87	56.14	55.53
1902	36	4	41.15	0.24	40.98	40.90	41.35	41.36

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	42.58	0.89	42.28	41.45	43.20	43.39				
1904	36	4	45.27	1.05	46.40	43.99	45.80	44.91				
1905	36	4	44.67	0.78	45.69	44.61	44.60	43.79				
1906	36	4	43.96	1.00	44.76	43.38	44.84	42.85				
1901	37	6	59.39	1.54	61.02	59.81	59.59	60.81	57.23	57.88		
1902	37	6	42.45	0.30	42.89	42.33	42.67	42.40	42.01	42.38		
1903	37	6	43.40	0.94	44.98	42.58	42.75	43.89	42.65	43.56		
1904	37	6	44.75	2.34 c	45.54	48.21	42.91	46.46	42.98	42.43		
1905	37	6	42.51	2.15	40.08	42.91	39.72	44.47	44.78	43.13		
1906	37	6	45.26	1.92	49.11	44.72	44.73	44.70	44.49	43.81		
1901	38	4	55.69	1.08	55.04	57.30	55.29	55.12				
1902	38	4	43.92	0.43	44.45	43.45	43.72	44.07				
1903	38	4	43.81	0.70	42.82	44.29	43.81	44.32				
1904	38	4	44.73	0.31	45.00	44.43	45.00	44.50				
1905	38	4	44.31	0.33	44.22	43.89	44.66	44.47				
1906	38	4	41.40	1.95 c	41.66	42.97	38.59	42.38				
1901	39	11	54.90	0.60	53.99	54.97	54.16	55.82	54.52	55.42	54.53	55.2
1902	39	11	41.04	0.20	40.78	40.95	41.04	40.68	41.19	41.29	41.07	40.9
1903	39	10	44.14	0.24	44.05	43.63	44.18	43.99	44.36	44.07	44.37	44.1
1904	39	9	45.53	0.38	45.59	44.91	45.49	45.34	45.87	46.12	45.19	45.8
1905	39	10	46.11	0.53	46.30	45.64	46.40	45.41	46.52	45.54	46.66	45.9
1906	39	10	42.98	0.19	42.58	43.06	43.24	43.15	42.82	43.00	42.84	43.0
1901	106	4	54.65	1.02	53.30	54.55	55.74	55.00				
1902	106	4	43.70	0.82 c	44.27	44.32	43.68	42.55				
1903	106	4	44.66	0.98	44.32	43.45	45.18	45.68				
1904	106	4	47.42	0.93	47.49	48.70	46.96	46.54				
1905	106	4	43.41	0.88	43.56	42.54	42.98	44.56				
1906	106	4	46.48	0.48	45.78	46.66	46.88	46.61				
1901	134	3	50.40	0.80	50.12	51.30	49.78					
1902	134	6	36.28B	0.37	36.65	36.70	36.27	36.30	35.73	36.03		
1903	134	4	39.09 b	0.65	38.89	39.36	39.82	38.30				
1904	134	0	39.38B	0.58	38.59	39.49	39.44	39.99				
1905	134	4	39.97	1.21	38.96	39.00	41.42	40.52				
1906	134	4	37.45	1.60	36.24	36.22	37.71	39.61				
1901	139	11	53.64	0.53	52.64	53.66	53.06	53.31	54.12	53.62	53.97	53.5
1902	139	11	39.89	0.18	39.67	39.84	39.72	39.81	40.04	39.74	39.94	39.8
1903	139	10	42.85	0.22	42.62	42.98	42.63	42.75	42.57	42.87	42.84	43.0
1904	139	10	44.37	0.28	44.01	44.51	44.03	44.64	44.15	44.61	44.07	44.3
1905	139	10	44.88	0.56	44.20	45.24	44.21	45.36	44.61	45.32	44.35	45.4
1906	139	10	41.52	0.29	41.21	41.46	41.60	41.01	41.61	41.43	41.77	41.4

18.11 ADFom

18.11.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	-0.57	-0.72	-0.57	-0.52	-0.95	-0.54
3	-1.77	-0.63	0.14	-0.39	0.08	-0.36
5	1.48	0.69	0.72	0.89	0.16	1.39
6	0.41	0.54	0.37	1.04	0.12	0.49
7	0.65	0.61	0.96	0.82	1.34	0.69
8	1.12	0.47	-0.07	1.23	0.04	0.01
9	0.05	0.13	0.94	-0.64	0.59	1.95
10	-0.05	0.28	0.41	0.58	-0.13	-0.22
14	0.31	-0.15	-1.90	0.17	-0.16	0.15
15	0.38	0.13	0.42	-0.66	-0.40	-0.59
16	-0.44	-0.50	-2.28	-1.96	-1.53	-1.81
17	-0.40	0.06	-1.24	-1.61	-0.78	-0.85
18	-0.72	-0.32	-0.30	-0.35	0.79	0.24
19	-0.55	-0.19	-0.22	-0.25	0.86	0.27
20	-0.64	-0.74	-0.82	-0.56	0.45	-0.17
22	-1.83	-1.57	-1.63	-0.82	-1.50	-1.06
23	0.72	0.86	1.17	0.76	1.12	0.31
24	0.49	0.96	0.54	0.21	0.20	0.17
25	1.08	1.37	0.68	0.78	-0.03	0.75
26	1.75	1.27	0.84	0.68	0.62	1.54
27	0.76	0.45	0.61	1.41	0.71	-0.57
29	-1.88	-0.79	-0.94	0.16	-1.65	-0.99
30	-1.88	-2.21			0.06	-1.00
31	0.25	0.22	1.90	0.35	0.21	0.14
32	-0.25	-0.44	0.74	-0.23	-0.25	-0.61
33	1.97	2.47	1.23	1.98	1.25	2.20
34	0.10	-0.45	0.07	-0.28	0.50	-0.33
35	0.81	1.10	0.74	0.43	0.14	1.40
36	0.38	0.03	-0.37	0.13	0.55	0.69
37	3.79	0.84	0.53	0.23	-0.69	1.89
38	-0.34	0.40	-0.38	-0.79	-0.62	-1.42
39	-0.70	-0.22	0.51	0.29	1.38	-0.18
106	-2.08	-1.30	-1.24	-0.69	-2.13	-0.68
134	-2.17	-1.95	-1.46	-2.13	-1.16	-2.12
139	-0.81	-0.71	-0.09	-0.26	0.80	-0.80

18.11.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	31.72	0.36	31.39	32.05	32.10	31.88	31.22	31.67
1902	1	6	21.79	0.22	21.42	22.07	21.81	21.67	21.91	21.86
1903	1	6	23.56	0.75	23.65	22.76	22.89	24.81	23.86	23.37
1904	1	6	23.91	1.56C	23.88	26.07	21.50	22.98	24.64	24.42
1905	1	6	23.91	0.98	22.60	23.20	23.77	24.99	25.08	23.84
1906	1	6	22.98	0.34	23.04	22.46	23.07	23.21	23.40	22.73
1901	3	4	30.40	0.37	30.18	30.50	30.86	30.04		
1902	3	4	21.89	0.33	22.33	21.61	21.67	21.95		
1903	3	4	24.34	0.69	24.72	24.99	24.24	23.42		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	24.05	0.34	23.75	23.77	24.32	24.39
1905	3	4	25.05	0.51	24.57	25.18	25.70	24.73
1906	3	4	23.18	0.19	23.33	23.07	22.97	23.37
1901	5	4	33.97	0.12	34.06	34.09	33.83	33.92
1902	5	4	23.34	0.21	23.56	23.21	23.13	23.47
1903	5	4	24.98	0.25	24.86	24.76	25.32	24.98
1904	5	4	25.47	0.30	25.11	25.43	25.51	25.84
1905	5	4	25.14	0.27	24.88	25.11	25.51	25.06
1906	5	4	25.11	0.26	24.92	25.15	24.92	25.46
1901	6	4	32.79	0.32	33.04	32.98	32.81	32.33
1902	6	4	23.18	0.30	23.35	23.32	23.30	22.73
1903	6	4	24.59	0.42	24.33	24.36	25.21	24.46
1904	6	4	25.63	0.42	25.08	25.54	26.02	25.88
1905	6	4	25.09	0.53	24.35	25.09	25.43	25.52
1906	6	4	24.12	0.32	23.71	24.03	24.39	24.35
1901	7	4	33.05	0.34	32.63	33.35	33.29	32.93
1902	7	4	23.26	0.30	23.64	23.20	22.90	23.30
1903	7	4	25.24	0.57	25.61	25.00	24.55	25.78
1904	7	4	25.39	0.43	26.02	25.22	25.07	25.26
1905	7	4	26.44	0.36	26.15	26.11	26.65	26.84
1906	7	4	24.34	0.30	23.89	24.49	24.48	24.48
1901	8	4	33.57	0.39	33.30	33.97	33.84	33.17
1902	8	4	23.10	0.19	23.25	22.87	23.27	23.02
1903	8	4	24.11	0.21	24.05	24.37	23.87	24.14
1904	8	4	25.84	0.33	25.57	25.55	26.19	26.07
1905	8	4	25.01	0.58	24.86	25.03	24.37	25.76
1906	8	4	23.59	0.24	23.52	23.75	23.27	23.81
1901	9	4	32.40	0.36	32.87	32.14	32.09	32.50
1902	9	4	22.73	0.29	22.90	22.32	22.72	22.97
1903	9	4	25.22	0.50	25.79	25.47	24.84	24.77
1904	9	4	23.78	0.69	22.76	24.27	23.96	24.12
1905	9	4	25.60	0.51	24.96	26.03	25.44	25.99
1906	9	4	25.72	0.31	25.38	26.13	25.76	25.62
1901	10	4	32.29	0.24	32.28	32.40	32.51	31.96
1902	10	4	22.89	0.26	23.03	23.13	22.86	22.54
1903	10	4	24.64	0.29	24.25	24.96	24.65	24.68
1904	10	4	25.13	0.30	24.79	25.30	24.98	25.45
1905	10	4	24.81	0.16	24.73	25.01	24.87	24.65
1906	10	4	23.33	0.52	23.27	24.07	22.87	23.13
1901	14	4	32.68	0.23	33.00	32.62	32.65	32.45
1902	14	4	22.41	0.16	22.19	22.57	22.48	22.42
1903	14	4	22.10	1.32	21.83	21.37	21.16	24.03
1904	14	4	24.68	0.56	25.38	24.69	24.63	24.01
1905	14	4	24.78	0.62	24.64	25.50	24.02	24.96
1906	14	4	23.75	0.12	23.57	23.83	23.82	23.77
1901	15	4	32.75	0.24	32.48	32.68	32.80	33.06
1902	15	4	22.73	0.26	22.84	23.03	22.56	22.48
1903	15	4	24.65	0.51	25.00	24.12	24.32	25.16
1904	15	4	23.76	0.47	23.32	24.34	23.43	23.94
1905	15	4	24.52	0.84	24.68	23.67	24.13	25.61
1906	15	4	22.92	0.24	22.91	23.26	22.76	22.77
1901	16	4	31.86	0.44	31.31	31.97	32.38	31.76
1902	16	4	22.03	0.21	21.86	22.34	21.91	22.00

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	21.67	0.74	20.68	21.55	22.23	22.23
1904	16	4	22.33	0.91	22.31	23.09	22.87	21.06
1905	16	4	23.28	1.55	22.33	24.74	21.59	24.45
1906	16	4	21.58	0.86	20.50	21.28	22.19	22.36
1901	17	4	31.90	0.39	32.15	32.23	31.37	31.85
1902	17	4	22.65	0.22	22.44	22.81	22.87	22.48
1903	17	4	22.82	0.33	23.13	22.46	23.07	22.60
1904	17	4	22.71	0.29	22.96	22.93	22.35	22.60
1905	17	4	24.10	0.25	24.24	24.38	23.94	23.83
1906	17	4	22.64	0.28	23.01	22.32	22.68	22.56
1901	18	4	31.55	0.49	31.57	31.05	32.21	31.38
1902	18	4	22.23	0.16	22.39	22.24	22.28	22.01
1903	18	4	23.86	0.13	23.81	23.83	23.75	24.05
1904	18	4	24.10	0.21	23.88	24.38	24.08	24.07
1905	18	4	25.82	0.78	26.95	25.64	25.54	25.17
1906	18	4	23.85	0.15	24.08	23.80	23.78	23.74
1901	19	4	31.74	0.55	31.70	31.16	32.48	31.62
1902	19	4	22.37	0.15	22.47	22.39	22.48	22.15
1903	19	4	23.94	0.08	24.01	23.90	23.86	24.00
1904	19	4	24.21	0.24	23.91	24.48	24.28	24.16
1905	19	4	25.90	0.74	26.97	25.78	25.57	25.28
1906	19	4	23.87	0.16	24.10	23.84	23.75	23.79
1901	20	4	31.64	0.78	31.79	30.67	32.57	31.52
1902	20	4	21.77	0.35	22.14	21.87	21.77	21.30
1903	20	4	23.28	0.24	23.00	23.53	23.18	23.43
1904	20	4	23.87	0.25	23.50	24.06	23.99	23.94
1905	20	4	25.45	0.84	26.50	25.75	24.92	24.64
1906	20	4	23.39	0.34	23.84	23.46	23.20	23.06
1901	22	4	30.33	0.17	30.43	30.12	30.50	30.25
1902	22	4	20.86	0.37	20.90	21.23	20.96	20.36
1903	22	4	22.40	0.33	22.02	22.47	22.81	22.28
1904	22	4	23.58	0.98	22.54	23.55	24.90	23.35
1905	22	4	23.30	0.44	23.60	23.09	23.74	22.79
1906	22	4	22.41	0.36	22.76	21.92	22.58	22.39
1901	23	4	33.13	0.11	32.98	33.14	33.24	33.17
1902	23	4	23.53	0.33	23.07	23.63	23.87	23.54
1903	23	4	25.47	0.29	25.12	25.54	25.80	25.40
1904	23	4	25.32	0.16	25.22	25.52	25.17	25.37
1905	23	4	26.20	0.74	26.73	26.60	26.36	25.11
1906	23	4	23.92	0.39	24.44	23.99	23.64	23.59
1901	24	4	32.88	0.24	32.71	32.77	33.24	32.81
1902	24	4	23.64	0.16	23.83	23.45	23.60	23.66
1903	24	4	24.78	0.38	25.01	24.30	25.14	24.65
1904	24	4	24.72	0.17	24.91	24.49	24.73	24.75
1905	24	4	25.18	0.12	25.11	25.25	25.04	25.31
1906	24	4	23.77	0.16	23.71	23.57	23.87	23.93
1901	25	4	33.53	0.42	33.26	33.34	33.36	34.15
1902	25	4	24.09	0.19	24.28	24.14	23.83	24.13
1903	25	4	24.93	1.08	26.31	24.57	25.09	23.73
1904	25	4	25.34	1.41	23.82	25.18	25.13	27.25
1905	25	4	24.93	0.68	25.82	25.07	24.55	24.28
1906	25	4	24.40	0.71	25.09	24.64	23.42	24.45
1901	26	4	34.26	0.65	33.31	34.74	34.44	34.56

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	23.98	0.23	23.64	24.09	24.06	24.13
1903	26	4	25.11	0.72	25.69	25.14	25.52	24.08
1904	26	4	25.24	0.62	25.49	25.86	25.20	24.41
1905	26	4	25.64	1.39	24.42	27.63	25.22	25.29
1906	26	4	25.27	1.36	25.88	26.76	23.61	24.83
1901	27	4	33.17	0.44	32.74	32.86	33.50	33.60
1902	27	4	23.08	0.35	23.07	22.65	23.50	23.10
1903	27	4	24.86	0.19	25.13	24.74	24.85	24.70
1904	27	4	26.04	0.29	25.68	26.15	26.35	25.98
1905	27	4	25.74	1.19	24.58	24.85	26.85	26.69
1906	27	4	22.95	0.75	22.07	22.61	23.51	23.63
1901	29	4	30.27	0.12	30.31	30.10	30.32	30.37
1902	29	4	21.71	0.25	21.82	21.63	21.99	21.41
1903	29	4	23.15	0.36	22.89	23.65	22.90	23.14
1904	29	4	24.66	1.25	23.23	24.30	24.90	26.22
1905	29	4	23.15	1.28	21.92	24.32	22.17	24.17
1906	29	4	22.49	1.08	21.48	22.31	22.17	24.02
1901	30	4	30.27	0.15	30.10	30.22	30.34	30.44
1902	30	4	20.16	0.15	19.94	20.27	20.18	20.23
1905	30	4	25.03	0.23	25.27	24.79	24.88	25.18
1906	30	4	22.48	0.19	22.41	22.27	22.73	22.50
1901	31	4	32.61	0.97	32.40	31.36	33.10	33.60
1902	31	4	22.82	1.08C	23.82	21.36	22.71	23.40
1903	31	4	26.27	0.89	25.75	26.99	27.05	25.29
1904	31	4	24.87	0.44	24.76	25.00	24.34	25.38
1905	31	4	25.19	1.92 c	26.73	25.96	22.38	25.67
1906	31	4	23.73	1.22	24.90	22.07	23.69	24.28
1901	32	4	32.06	0.51	31.80	31.80	31.83	32.83
1902	32	4	22.10	0.57C	22.80	21.85	21.48	22.28
1903	32	4	25.00	1.02	24.74	26.08	25.47	23.72
1904	32	4	24.23	0.09	24.23	24.12	24.34	24.21
1905	32	4	24.69	0.98	25.84	24.78	23.44	24.69
1906	32	4	22.91	0.85	23.92	22.90	21.83	23.00
1901	33	2	34.51	0.09	34.57	34.45		
1902	33	4	25.30	0.11	25.21	25.45	25.23	25.31
1903	33	4	25.54	1.29	27.22	24.08	25.41	25.43
1904	33	4	26.66	0.53	27.17	26.99	26.50	25.99
1905	33	4	26.33	0.64	25.67	26.93	26.82	25.89
1906	33	4	26.00	1.03	24.70	26.84	25.64	26.81
1901	34	2	32.45	1.85C	31.14	33.76		
1902	34	2	22.09	0.16	22.20	21.98		
1903	34	2	24.26	0.04	24.23	24.29		
1904	34	2	24.18	0.62	23.75	24.62		
1905	34	2	25.51	0.04	25.54	25.48		
1906	34	2	23.21	0.66	22.75	23.68		
1901	35	4	33.23	0.33	32.89	33.63	33.35	33.05
1902	35	4	23.80	0.27	24.06	23.42	23.87	23.84
1903	35	4	25.00	0.62	25.43	24.66	24.30	25.61
1904	35	4	24.96	0.31	25.25	24.51	25.05	25.03
1905	35	4	25.12	0.34	24.90	25.37	25.44	24.76
1906	35	4	25.12	0.51	25.62	24.45	25.04	25.37
1901	36	4	32.75	0.33	33.01	32.76	32.97	32.28
1902	36	4	22.61	0.07	22.70	22.64	22.52	22.60

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	23.78	0.53	23.67	23.07	24.16	24.23				
1904	36	4	24.63	0.66	25.15	23.79	25.16	24.39				
1905	36	4	25.57	0.66	26.50	25.28	25.50	24.99				
1906	36	4	24.33	0.54	24.73	23.97	24.85	23.77				
1901	37	6	36.51b	1.13	37.90	36.64	36.78	37.37	35.04	35.30		
1902	37	6	23.51	0.22	23.77	23.57	23.66	23.51	23.14	23.42		
1903	37	6	24.77	0.69	25.84	24.11	24.23	25.29	24.31	24.85		
1904	37	6	24.74	1.78C	25.60	27.39	23.31	25.78	23.41	22.94		
1905	37	6	24.20	1.72	22.62	24.47	21.72	25.77	26.06	24.56		
1906	37	6	25.66	1.45 c	28.56	25.15	25.41	25.33	24.69	24.80		
1901	38	4	31.97	0.70	31.29	32.86	32.16	31.56				
1902	38	4	23.03	0.14	22.97	22.85	23.16	23.13				
1903	38	4	23.77	0.68	22.78	24.15	23.85	24.29				
1904	38	4	23.62	0.15	23.65	23.60	23.80	23.43				
1905	38	4	24.28	0.20	24.36	24.17	24.51	24.06				
1906	38	4	22.01	1.13	22.04	23.45	20.69	21.87				
1901	39	11	32.21	0.42	31.60	32.20	31.64	32.79	31.98	32.60	31.97	32.4
1902	39	11	22.34	0.17	22.15	22.05	22.35	22.21	22.36	22.41	22.46	22.2
1903	39	10	24.75	0.22	24.80	24.27	24.88	24.49	25.00	24.70	24.87	24.8
1904	39	9	24.81	0.36	24.91	24.34	25.03	24.42	25.26	25.12	24.44	25.1
1905	39	10	26.47	0.36	26.52	26.07	26.66	26.18	26.80	26.00	26.88	26.3
1906	39	10	23.38	0.16	23.06	23.33	23.55	23.38	23.33	23.39	23.47	23.4
1901	106	4	30.05	0.19	30.16	29.78	30.06	30.19				
1902	106	4	21.15	0.13	21.33	21.03	21.09	21.15				
1903	106	4	22.82	0.30	22.52	22.96	23.18	22.64				
1904	106	4	23.73	0.12	23.83	23.61	23.84	23.64				
1905	106	4	22.62	0.30	23.02	22.33	22.66	22.47				
1906	106	4	22.83	0.20	22.99	22.99	22.61	22.71				
1901	134	3	29.95	0.15	29.88	30.12	29.85					
1902	134	6	20.44	0.24	20.78	20.64	20.50	20.18	20.33	20.19		
1903	134	4	22.57	0.36	22.47	22.61	23.04	22.18				
1904	134	4	22.15	0.28	22.04	22.42	21.81	22.32				
1905	134	4	23.68	0.57	23.30	23.35	24.52	23.57				
1906	134	4	21.24	0.79	20.67	20.65	21.34	22.32				
1901	139	11	31.45	0.42	30.69	31.58	30.97	31.14	31.84	31.31	31.91	31.2
1902	139	11	21.80	0.17	21.44	21.82	21.70	21.74	21.96	21.62	21.81	21.9
1903	139	10	24.08	0.17	23.81	24.14	23.98	24.09	23.94	24.20	24.02	24.2
1904	139	10	24.20	0.27	23.80	24.41	23.95	24.28	24.01	24.40	23.95	24.1
1905	139	10	25.84	0.38	25.29	26.12	25.49	26.14	25.61	26.09	25.68	26.2
1906	139	10	22.70	0.21	22.60	22.67	22.71	22.45	22.84	22.49	22.99	22.6

18.12 Elos / Cellulase

18.12.1 z-Werte / z Scores

Labor/Lab	1901	1902	1903	1904	1905	1906
1	0.78	1.14	1.09	0.83	1.23	0.92
3	3.68	0.85	0.75	0.20	0.37	-0.04
5	-1.15	-0.51	-0.30	-0.35	0.15	-0.46
6	-0.76	-0.86	-0.60	-1.06	-0.22	-0.36
7	-1.20	-0.94	-1.14	-0.95	-1.21	-0.84
8	-1.38	-0.97	-0.52	-1.58	-0.56	-0.58
9	0.58	0.41	0.02	0.50	-0.10	-1.00
10	0.26	0.17	0.05	-0.00	0.57	0.77
14	0.17	0.44	0.96	-0.17	0.07	-0.01
15	-0.22	0.26	-0.74	0.12	-0.18	0.27
16	0.26	0.28	1.64	1.41	0.84	1.35
17	-0.42	-0.41	0.62	0.87	0.33	0.73
18	0.19	0.24	0.67	0.80	-0.44	0.43
19	0.08	-0.01	0.24	0.44	-0.77	0.02
20	0.53	0.91	1.36	1.34	0.07	1.01
22	0.29	-0.26	-0.90	-1.44	-1.17	-1.52
23	-0.01	-0.07	0.07	0.57	0.57	1.03
24	-0.26	-0.49	-0.02	0.28	0.29	0.41
25	-0.55	-0.70	-0.37	-0.60	-0.25	-0.75
26	-0.74	-0.40	-0.10	-0.11	0.17	-0.43
27	-0.57	-0.13	-0.64	-1.23	-0.84	0.00
29	2.38	1.03	0.98	0.13	2.14	1.32
30	1.14	1.71			-0.78	0.16
31	0.08	-0.04	-2.10	-0.58	-0.47	-0.39
32	0.34	0.96	-0.90	-0.15	0.51	0.92
33	-5.43	-5.77	-4.49	-5.37	-4.05	-5.30
34	1.08	0.33	1.39	0.95	0.68	-0.02
35	-0.74	-1.08	-0.36	-0.32	0.05	-0.81
36	-1.10	-0.74	-0.58	-0.84	-1.41	-1.02
37	-3.49	-0.59	-1.47	-1.01	-0.68	-2.67
38	0.32	-0.40	0.28	1.12	1.17	1.76
39	-0.51	-0.96	-1.02	-1.12	-1.73	-0.84
106	-0.07	-0.31	0.23	0.16	1.28	-0.05
134	1.20	1.18	1.39	1.88	0.95	1.43
139	0.25	-0.05	0.04	-0.07	-0.62	0.07

18.12.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values					
1901	1	6	59.61	0.55	60.00	59.40	58.90	59.40	60.49	59.49
1902	1	6	73.53	0.41	74.34	73.13	73.48	73.51	73.36	73.39
1903	1	6	70.14	1.16	70.46	71.48	70.45	68.00	70.00	70.48
1904	1	6	69.25	2.05	69.45	66.12	72.28	70.34	68.55	68.74
1905	1	6	68.90	1.37	70.68	69.98	68.73	67.42	67.28	69.31
1906	1	6	70.84	0.52	70.62	71.36	71.06	70.18	70.38	71.44
1901	3	4	64.68 b	0.43	64.07	65.05	64.83	64.78		
1902	3	4	73.03	0.42	72.44	73.30	73.37	73.01		
1903	3	4	69.54	0.93	68.87	68.72	70.70	69.89		

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1904	3	4	68.14	1.12	68.01	69.64	67.97	66.95
1905	3	4	67.40	0.32	67.10	67.68	67.13	67.67
1906	3	4	69.17	0.61	69.41	68.47	69.89	68.93
1901	5	4	56.24	0.30	56.42	55.83	56.50	56.22
1902	5	4	70.65	0.25	70.87	70.75	70.69	70.30
1903	5	4	67.71	0.45	68.12	68.08	67.30	67.35
1904	5	4	67.19	0.45	67.53	67.16	67.50	66.56
1905	5	4	67.00	0.42	67.14	66.85	66.50	67.50
1906	5	4	68.44	0.62	68.98	67.86	68.96	67.95
1901	6	4	56.92	0.58	56.32	56.65	57.06	57.65
1902	6	4	70.03	0.33	69.87	69.78	69.96	70.52
1903	6	4	67.19	0.60	67.34	67.44	66.32	67.67
1904	6	4	65.95	0.42	66.44	65.94	65.41	66.01
1905	6	4	66.35	0.74	67.21	66.73	65.84	65.63
1906	6	4	68.60	0.66	69.56	68.15	68.14	68.56
1901	7	4	56.15	0.17	56.32	56.23	55.93	56.10
1902	7	4	69.91	0.43	69.51	69.85	69.76	70.51
1903	7	4	66.25	0.21	66.06	66.50	66.33	66.09
1904	7	4	66.13	0.27	65.74	66.36	66.17	66.25
1905	7	4	64.62	0.44	64.49	65.11	64.08	64.80
1906	7	4	67.77	0.33	67.31	67.89	67.77	68.09
1901	8	4	55.83	0.58	56.13	55.49	55.22	56.49
1902	8	4	69.85	0.31	70.20	70.01	69.54	69.66
1903	8	4	67.33	0.53	67.97	67.11	66.74	67.50
1904	8	4	65.03	0.53	65.20	65.18	64.26	65.48
1905	8	4	65.77	0.73	65.37	66.32	66.45	64.95
1906	8	4	68.22	0.74	68.86	67.80	68.84	67.39
1901	9	4	59.27	0.51	58.57	59.64	59.64	59.21
1902	9	4	72.27	0.66	71.97	73.22	72.17	71.71
1903	9	4	68.27	0.72	67.28	68.23	68.63	68.93
1904	9	4	68.68	0.58	69.51	68.53	68.16	68.53
1905	9	4	66.56	0.83	67.74	65.86	66.54	66.11
1906	9	4	67.49	0.35	67.77	66.98	67.53	67.69
1901	10	4	58.71	0.26	58.74	58.66	58.41	59.03
1902	10	4	71.83	0.40	71.71	71.49	71.73	72.41
1903	10	4	68.33	0.38	68.72	67.83	68.27	68.52
1904	10	4	67.79	0.65	68.07	67.99	68.28	66.83
1905	10	4	67.73	0.23	68.00	67.46	67.81	67.66
1906	10	4	70.58	0.61	70.77	69.72	71.16	70.66
1901	14	4	58.55	0.52	57.95	58.69	58.38	59.18
1902	14	4	72.31	0.13	72.40	72.20	72.20	72.44
1903	14	4	69.92	1.33	70.42	70.62	70.71	67.94
1904	14	4	67.51	0.66	66.74	67.47	67.47	68.35
1905	14	4	66.87	0.76	66.93	66.11	67.89	66.55
1906	14	4	69.22	0.12	69.26	69.37	69.14	69.09
1901	15	4	57.87	0.31	58.19	58.06	57.52	57.71
1902	15	4	72.01	0.62	71.56	71.51	72.84	72.11
1903	15	4	66.94	0.61	66.68	67.63	67.21	66.22
1904	15	4	68.01	0.70	67.99	67.15	68.86	68.03
1905	15	4	66.43	0.86	66.62	67.24	66.67	65.21
1906	15	4	69.71	0.39	69.77	69.21	69.71	70.17
1901	16	4	58.69	0.65	59.42	58.73	57.85	58.77
1902	16	4	72.04	0.32	71.98	71.61	72.21	72.36

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1903	16	4	71.10	1.01	72.50	70.95	70.86	70.10
1904	16	4	70.27	1.07	69.90	69.56	69.76	71.87
1905	16	4	68.22	1.96	69.89	66.23	69.93	66.83
1906	16	4	71.61	0.94	72.92	71.63	71.05	70.83
1901	17	4	57.52	0.59	56.80	57.26	58.07	57.93
1902	17	4	70.83	0.24	71.15	70.77	70.57	70.83
1903	17	4	69.32	0.56	68.96	69.82	68.73	69.78
1904	17	4	69.33	0.38	69.05	69.27	69.88	69.11
1905	17	4	67.32	0.68	66.97	66.55	67.79	67.97
1906	17	4	70.51	0.45	70.05	71.12	70.44	70.42
1901	18	4	58.58	0.66	58.89	59.05	57.61	58.78
1902	18	4	71.96	0.26	71.79	71.77	71.93	72.34
1903	18	4	69.40	0.27	69.58	69.25	69.68	69.11
1904	18	4	69.20	0.18	69.30	68.97	69.37	69.16
1905	18	4	65.97	0.92	64.67	66.26	66.11	66.84
1906	18	4	70.00	0.25	69.84	70.29	70.11	69.74
1901	19	4	58.39	0.86	58.47	59.29	57.23	58.60
1902	19	4	71.54	0.30	71.41	71.44	71.32	71.98
1903	19	4	68.67	0.21	68.69	68.42	68.93	68.62
1904	19	4	68.56	0.20	68.82	68.37	68.45	68.61
1905	19	4	65.40	1.16	63.76	65.56	65.80	66.47
1906	19	4	69.27	0.41	69.12	69.58	69.62	68.77
1901	20	4	59.17	1.01	58.95	60.49	58.04	59.20
1902	20	4	73.13	0.42	72.84	72.79	73.22	73.69
1903	20	4	70.62	0.41	71.01	70.21	70.96	70.33
1904	20	4	70.15	0.41	70.75	70.03	69.83	69.99
1905	20	4	66.86	1.18	65.40	66.45	67.61	68.00
1906	20	4	71.01	0.35	70.50	71.21	71.27	71.05
1901	22	4	58.75	0.41	58.16	58.93	59.09	58.80
1902	22	4	71.08	0.74	70.78	70.55	70.81	72.19
1903	22	4	66.66	0.48	67.10	66.14	66.36	67.03
1904	22	4	65.28	1.10	66.71	65.28	64.03	65.10
1905	22	4	64.69	0.84	64.72	64.47	63.78	65.80
1906	22	4	66.58	1.19	65.10	67.88	66.22	67.11
1901	23	4	58.23	0.22	58.42	58.39	58.19	57.94
1902	23	4	71.41	0.39	71.85	71.40	70.90	71.50
1903	23	4	68.37	0.35	68.53	68.56	67.84	68.54
1904	23	4	68.79	0.32	68.94	68.34	69.08	68.81
1905	23	4	67.74	1.03	67.20	67.22	67.27	69.28
1906	23	4	71.05	0.63	70.27	70.84	71.67	71.40
1901	24	4	57.79	0.40	58.32	57.84	57.39	57.61
1902	24	4	70.70	0.42	70.46	71.16	70.93	70.24
1903	24	4	68.20	0.36	68.14	68.73	67.94	68.00
1904	24	4	68.29	0.17	68.10	68.43	68.43	68.18
1905	24	4	67.24	0.45	66.92	67.13	67.90	67.02
1906	24	4	69.95	0.34	70.34	70.08	69.85	69.54
1901	25	4	57.28	0.60	57.62	57.70	57.40	56.40
1902	25	4	70.32	0.50	69.85	70.39	70.98	70.05
1903	25	4	67.59	1.29	65.86	67.86	67.66	68.97
1904	25	4	66.74	1.46	68.06	66.71	67.49	64.71
1905	25	4	66.30	0.40	65.90	66.38	66.81	66.10
1906	25	4	67.93	0.89	67.51	68.12	69.08	67.02
1901	26	4	56.95	1.05	58.48	56.09	56.70	56.54

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
1902	26	4	70.84	0.46	71.54	70.64	70.59	70.60
1903	26	4	68.07	0.89	67.14	68.41	67.59	69.14
1904	26	4	67.61	0.93	67.36	66.66	67.54	68.89
1905	26	4	67.04	2.01	68.44	64.08	67.50	68.16
1906	26	4	68.48	1.38	67.90	66.94	70.13	68.96
1901	27	4	57.24	0.33	57.58	57.23	57.36	56.80
1902	27	4	71.32	0.30	71.38	71.71	71.04	71.14
1903	27	4	67.11	0.59	66.58	67.62	66.63	67.62
1904	27	4	65.64	0.18	65.80	65.69	65.67	65.39
1905	27	4	65.27	1.56	66.98	66.16	64.24	63.69
1906	27	4	69.24	0.52	69.42	69.86	69.03	68.66
1901	29	4	62.41	0.42	62.32	62.15	62.13	63.01
1902	29	4	73.35	0.93	72.82	73.20	72.68	74.71
1903	29	4	69.96	0.66	70.41	69.15	69.69	70.57
1904	29	4	68.03	1.10	68.96	68.98	66.91	67.27
1905	29	4	70.48	0.70	71.06	71.12	69.83	69.92
1906	29	4	71.54	1.14	71.25	72.25	72.61	70.06
1901	30	4	60.24	0.18	60.17	60.51	60.14	60.14
1902	30	4	74.54	0.17	74.46	74.52	74.79	74.41
1905	30	4	65.38	0.24	65.36	65.56	65.57	65.05
1906	30	4	69.51	0.48	69.38	69.94	68.88	69.83
1901	31	4	58.38	1.46	59.37	59.80	57.65	56.70
1902	31	4	71.47	1.05 c	70.49	72.92	71.48	70.98
1903	31	4	64.57	1.37	65.65	63.81	63.02	65.78
1904	31	4	66.78	0.63	66.75	66.88	67.51	65.97
1905	31	4	65.91	2.48 c	64.02	64.86	69.55	65.23
1906	31	4	68.55	1.44	67.21	70.40	68.95	67.65
1901	32	4	58.85	0.44	58.37	59.38	59.00	58.64
1902	32	4	73.23	0.61	72.36	73.48	73.78	73.31
1903	32	4	66.66	1.13	67.05	65.03	66.93	67.64
1904	32	4	67.54	1.19	65.87	67.50	68.50	68.29
1905	32	4	67.63	1.17	67.07	67.87	69.14	66.43
1906	32	4	70.85	1.17	70.76	70.80	72.34	69.49
1901	33	0	48.75B	0.08	48.81	48.70		
1902	33	0	61.45B	0.61	62.02	60.84	61.02	61.93
1903	33	0	60.38B	1.98	57.72	62.46	60.98	60.37
1904	33	0	58.40B	1.89	57.78	56.13	59.09	60.58
1905	33	0	59.66B	0.76	58.94	59.08	60.23	60.40
1906	33	0	59.97B	1.44	62.09	59.12	59.61	59.05
1901	34	2	60.13	1.70C	61.33	58.93		
1902	34	2	72.11	0.52	72.48	71.74		
1903	34	2	70.67	3.65C	68.08	73.25		
1904	34	2	69.46	2.53C	71.25	67.67		
1905	34	2	67.93	0.54	67.55	68.31		
1906	34	2	69.19	1.12	69.99	68.40		
1901	35	4	56.95	0.81	57.63	55.85	56.84	57.48
1902	35	4	69.66	0.85	69.24	70.78	68.81	69.81
1903	35	4	67.60	0.87	67.28	68.18	68.42	66.53
1904	35	4	67.23	0.19	67.09	67.12	67.51	67.20
1905	35	4	66.82	0.44	67.37	66.32	66.69	66.91
1906	35	4	67.81	0.82	66.84	68.82	67.98	67.61
1901	36	4	56.32	0.29	56.12	56.65	56.03	56.47
1902	36	4	70.25	0.55	70.88	69.54	70.30	70.27

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values							
1903	36	4	67.23	0.69	67.00	68.22	67.07	66.62				
1904	36	4	66.32	0.82	66.13	67.36	65.38	66.43				
1905	36	4	64.28	1.22	62.66	65.40	64.07	64.99				
1906	36	4	67.45	0.77	67.12	68.08	66.52	68.07				
1901	37	6	52.13	1.44	50.36	52.12	51.58	51.08	53.95	53.72		
1902	37	6	70.51	0.29	70.11	70.44	70.55	70.47	71.00	70.51		
1903	37	6	65.66	0.82	64.54	66.37	66.53	64.81	65.90	65.84		
1904	37	6	66.03	2.28C	64.27	62.62	67.83	65.61	67.34	68.51		
1905	37	6	65.55	1.99	66.88	65.35	68.75	63.69	63.52	65.11		
1906	37	6	64.56	1.70	61.24	65.29	65.01	64.45	65.90	65.46		
1901	38	4	58.80	0.42	59.32	58.45	58.97	58.47				
1902	38	4	70.84	0.56	70.48	71.27	71.38	70.25				
1903	38	4	68.72	0.87	69.71	68.76	68.83	67.59				
1904	38	4	69.75	1.17	68.56	71.13	70.29	69.02				
1905	38	4	68.78	0.54	69.17	68.62	69.26	68.09				
1906	38	3	70.88	0.12	70.84	71.02	76.64A	70.79				
1901	39	11	56.60	0.54	57.44	56.62	57.01	55.76	56.69	55.91	56.55	56
1902	39	11	69.86	0.20	69.99	69.95	69.87	70.11	69.72	69.97	69.99	69
1903	39	10	66.46	0.30	66.29	66.97	66.22	66.75	66.16	66.72	66.23	66
1904	39	9	65.83	0.46	65.49	66.04	65.51	66.37	65.45	65.75	66.29	65
1905	39	10	63.71	0.60	63.89	64.17	63.63	64.26	62.87	64.39	63.02	64
1906	39	10	67.76	0.23	68.04	67.89	67.46	68.02	67.63	67.64	67.43	67
1901	106	4	58.12	0.62	59.02	57.97	57.62	57.87				
1902	106	4	71.00	0.36	70.76	71.12	70.67	71.47				
1903	106	4	68.63	0.61	69.39	68.85	68.28	68.02				
1904	106	4	68.09	1.25	68.50	66.53	67.81	69.51				
1905	106	4	68.98	0.33	68.79	69.31	69.19	68.61				
1906	106	4	69.14	0.54	68.85	68.53	69.69	69.48				
1901	134	3	60.35	0.30	60.28	60.09	60.67					
1902	134	6	73.61	0.44	73.21	73.22	73.55	74.35	73.44	73.91		
1903	134	4	70.67	0.64	71.15	70.86	69.73	70.95				
1904	134	4	71.08	1.10	70.34	70.14	72.55	71.31				
1905	134	4	68.41	1.06	67.83	68.01	67.80	69.99				
1906	134	4	71.73	1.06	72.58	72.53	71.49	70.33				
1901	139	11	58.68	0.50	59.55	58.30	59.35	58.78	58.27	59.13	58.08	58
1902	139	11	71.47	0.29	71.97	71.31	71.63	71.41	71.04	71.88	71.30	71
1903	139	10	68.31	0.31	68.79	68.39	68.02	68.60	68.37	68.19	68.40	67
1904	139	10	67.68	0.27	67.84	67.22	67.25	67.87	67.92	67.92	67.73	67
1905	139	10	65.65	0.58	66.14	65.28	66.11	65.32	65.95	65.65	65.83	64
1906	139	10	69.35	0.34	69.66	68.88	69.40	69.63	69.25	69.58	69.46	69