Qualitätssicherung für
die NIRS/NIT-Analytik

VDLUFA

Auswertung VDLUFA-Ringversuch Silomais
NIRS-Methode 2020:
Report for VDLUFA Proficiency Test Forage Maize
NIRS method 2020:

VDLUFA

Raps
Erbsen
Silomais
Grassilage
Maissilage
Braugerste
Backweizen

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Nur für den internen Gebrauch der Teilnehmer an diesem Ring-versuch

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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

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2 Aufbau des Ringversuchs / Design of Proficiency Test

Material/Materials : 6 Proben/Samples: Silomais

		2001	2002	2003	2004	2005	2006
Trockenmasse / dry matter	[%]	90.09	90.04	90.38	90.30	90.48	90.36
Rohprotein / XP	[% TM]	6.73	6.09	7.11	6.95	6.50	6.37
Rohfaser / XF	[% TM]	27.13	18.01	16.01	15.92	16.24	16.69
Rohfett / XL	[% TM]	1.90	2.65	2.71	2.80	2.72	2.87
Stärke / XS	[% TM]	7.66	31.64	37.46	36.78	37.56	36.10
Zucker / XZ	[% TM]	11.73	8.43	5.71	6.67	6.95	7.11
aNDFom	[% TM]	55.85	38.76	35.54	34.97	34.92	36.66
ADFom	[% TM]	34.07	23.44	20.46	20.69	20.93	21.37
ADL	[% TM]	3.02	1.72	1.55	1.46	1.47	1.39
NDF	[% TM]	56.07	41.55	37.38	37.17	37.59	38.71
ADFom	[% TM]	34.37	23.04	20.04	19.94	20.35	20.91
Elos / Cellulase	[% TM]	53.45	68.56	72.12	72.73	72.58	72.49

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 2020

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

AG Fuko, Isernhagen
BfUL, Nossen
BSA, Hannover
Caussade Semences, Recainville, F
Corteva, Buxtehude
FH Kiel, Rendsburg
Inst. Nuss, Bad Kissingen
IS Forschung, Wahlstedt
KWS, Einbeck
LELF, Paulinenaue
LfL, Fresing
LfL, Grub
LfLG, Bernburg

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LHL, Kassel
LTZ Augustenberg, Karlsruhe
LUFA Nord-West, Oldenburg
LUFA NRW, Münster
LUFA Rheinland-Pfalz, Speyer
LUFA Rostock, Rostock
MAS Seeds, Neckarmühlbach
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-

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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.

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

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fao.org/ag/againfo/home/documents/2015_Announcemen Ring_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 und 36 nutzten für den Ringversuch ein Bruker MPA-Gerät, die Labor 20 und 113 ein Foss XDS-Gerät, die Labore 37 und 137 ein Foss DS2500-Gerät, die Labore 3, 29, 32 und 33 Unity Scientific SpectraStar-Geräte, die Labore 6, 34 und 38 nutzen ein BlueSun Phoenix 5000 (vormals: ITG M5). 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 and 36 used a Bruker MPA, the labs 20 and 113 a Foss XDS, the labs 37 and 137 a Foss DS2500, the labs 3, 29, 32 and 33 used Unity Scientific SpectraStar and labs 6, 34 and 38 a BlueSun Phoenix (previously: ITG M5) 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).

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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.

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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.

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Lab.	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	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	5 / 6
5	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	2 / 6	6 / 6	6 / 6	5 / 6	5 / 6	6 / 6
6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	4 / 6	6 / 6	6 / 6
7	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
8	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	0 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
9	6 / 6	6 / 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
13	5 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
14	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 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
17	6 / 6	6 / 6	5 / 6	6 / 6	3 / 6	4 / 6	4 / 6	3 / 6	6 / 6	5 / 6	6 / 6	2 / 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	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
22	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	0 / 6	6 / 6	6 / 6	3 / 6	6 / 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	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 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
28	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	6 / 6	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
30	5 / 6	0 / 6	6 / 6	5 / 6	6 / 6	0 / 6	5 / 6	6 / 6	1 / 6	3 / 6	4 / 6	6 / 6
31	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
32	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	2 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
33	6 / 6	5 / 6	6 / 6	6 / 6	5 / 6	0 / 6	6 / 6	5 / 6	0 / 6	6 / 6	6 / 6	6 / 6
34	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	4 / 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	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	1 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
37	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6
38	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	3 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
40	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6
113	6 / 6	5 / 6	4 / 6	6 / 6	6 / 6	6 / 6	4 / 6	4 / 6	6 / 6	6 / 6	6 / 6	3 / 6
137	6 / 6	5 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	6 / 6	5 / 6	6 / 6

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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.

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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

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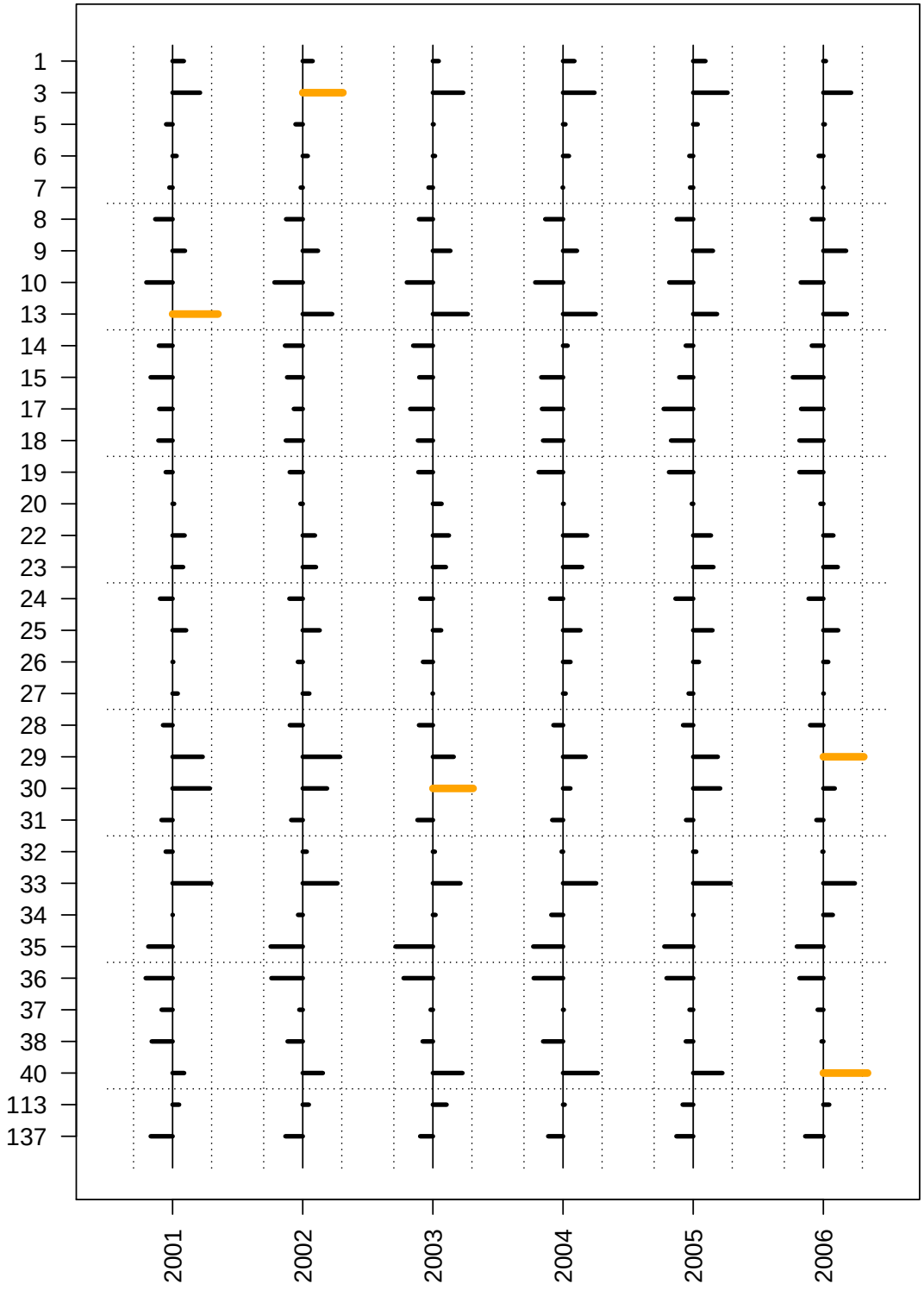
Trockenmasse / dry matter

z-Werte / z Scores



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Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Trockenmasse / dry matter

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	90.49	0.39	90.34	0.30	90.59	0.21	90.64	0.34	90.86	0.38	90.46	0.09	**0.28**	**0.33**
3	91.05	0.96	91.26	1.22	91.45	1.07	91.24	0.94	91.54	1.06	91.40	1.04	**1.05**	**1.15**
5	89.87	-0.23	89.82	-0.22	90.41	0.03	90.38	0.07	90.62	0.14	90.42	0.05	**-0.03**	**0.16**
6	90.23	0.14	90.19	0.15	90.45	0.07	90.48	0.18	90.37	-0.12	90.19	-0.17	**0.04**	**0.16**
7	89.98	-0.11	89.98	-0.06	90.23	-0.15	90.29	-0.01	90.39	-0.10	90.35	-0.01	**-0.07**	**0.10**
8	89.49	-0.61	89.54	-0.50	89.89	-0.49	89.77	-0.53	89.98	-0.51	89.93	-0.43	**-0.51**	**0.56**
9	90.53	0.43	90.50	0.46	91.00	0.62	90.72	0.42	91.09	0.61	91.21	0.85	**0.56**	**0.64**
10	89.18	-0.92	89.19	-0.86	89.46	-0.92	89.47	-0.83	89.75	-0.74	89.52	-0.84	**-0.85**	**0.93**
13	91.68	1.59	90.93	0.89	91.61	1.23	91.28	0.98	91.22	0.73	91.24	0.88	**1.05**	**1.19**
14	89.61	-0.48	89.50	-0.54	89.68	-0.70	90.44	0.14	90.26	-0.23	89.93	-0.43	**-0.37**	**0.50**
15	89.32	-0.77	89.57	-0.47	89.90	-0.48	89.65	-0.65	90.06	-0.43	89.22	-1.14	**-0.66**	**0.77**
17	89.63	-0.47	89.77	-0.27	89.58	-0.80	89.67	-0.63	89.57	-0.91	89.53	-0.83	**-0.65**	**0.75**
18	89.60	-0.50	89.53	-0.51	89.85	-0.53	89.71	-0.60	89.80	-0.68	89.47	-0.89	**-0.62**	**0.69**
19	89.85	-0.24	89.65	-0.39	89.87	-0.51	89.57	-0.73	89.74	-0.75	89.47	-0.89	**-0.59**	**0.69**
20	90.14	0.05	89.97	-0.07	90.69	0.31	90.32	0.02	90.44	-0.04	90.25	-0.11	**0.03**	**0.15**
22	90.51	0.42	90.41	0.37	90.95	0.57	91.02	0.72	91.03	0.55	90.73	0.37	**0.50**	**0.56**
23	90.46	0.37	90.44	0.40	90.84	0.46	90.88	0.57	91.11	0.62	90.90	0.54	**0.49**	**0.55**
24	89.65	-0.44	89.64	-0.40	89.94	-0.44	89.92	-0.39	89.94	-0.55	89.81	-0.55	**-0.46**	**0.51**
25	90.57	0.47	90.55	0.51	90.67	0.29	90.82	0.52	91.08	0.59	90.91	0.55	**0.49**	**0.55**
26	90.11	0.02	89.89	-0.15	90.03	-0.35	90.53	0.22	90.66	0.18	90.54	0.18	**0.02**	**0.23**
27	90.27	0.18	90.24	0.20	90.37	-0.01	90.38	0.08	90.34	-0.14	90.38	0.01	**0.05**	**0.14**
28	89.76	-0.33	89.65	-0.39	89.89	-0.49	90.02	-0.29	90.17	-0.31	89.87	-0.49	**-0.38**	**0.43**
29	91.15	1.05	91.17	1.13	91.12	0.74	90.98	0.67	91.24	0.76	91.87	1.51	**0.98**	**1.12**
30	91.40	1.31	90.78	0.74	91.80	1.42	90.52	0.22	91.32	0.83	90.78	0.42	**0.82**	**1.02**
31	89.71	-0.39	89.69	-0.35	89.84	-0.54	89.98	-0.32	90.26	-0.22	90.10	-0.26	**-0.35**	**0.40**
32	89.85	-0.24	90.16	0.12	90.45	0.07	90.26	-0.04	90.58	0.09	90.33	-0.03	**-0.01**	**0.13**
33	91.45	1.35	91.09	1.05	91.36	0.97	91.30	0.99	91.64	1.16	91.54	1.18	**1.12**	**1.23**
34	90.10	0.01	89.90	-0.14	90.47	0.09	89.95	-0.35	90.50	0.01	90.71	0.35	**-0.00**	**0.23**
35	89.24	-0.85	89.07	-0.97	89.06	-1.32	89.41	-0.89	89.59	-0.89	89.37	-0.99	**-0.99**	**1.09**
36	89.15	-0.94	89.09	-0.95	89.35	-1.03	89.43	-0.88	89.66	-0.82	89.47	-0.89	**-0.92**	**1.01**
37	89.71	-0.38	89.94	-0.10	90.30	-0.08	90.33	0.02	90.37	-0.11	90.15	-0.21	**-0.14**	**0.21**
38	89.36	-0.73	89.58	-0.46	90.02	-0.36	89.71	-0.60	90.26	-0.23	90.30	-0.06	**-0.41**	**0.51**
40	90.50	0.40	90.65	0.61	91.43	1.05	91.34	1.04	91.38	0.90	92.01	1.65	**0.94**	**1.12**
113	90.32	0.23	90.23	0.18	90.86	0.48	90.35	0.05	90.16	-0.33	90.58	0.22	**0.14**	**0.31**
137	89.33	-0.77	89.52	-0.52	89.93	-0.45	89.86	-0.44	89.97	-0.52	89.68	-0.68	**-0.56**	**0.63**

[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*

VDLUFA

Trockenmasse / dry matter

6.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006
n	144	144	145	145	145	144
p	35	35	35	35	35	35
n_1	144	144	145	145	145	144
p_1	35	35	35	35	35	35
m	90.09	90.04	90.38	90.30	90.48	90.36
s_r	0.17	0.16	0.19	0.17	0.15	0.21
CV_r	0.18	0.18	0.21	0.19	0.17	0.24
r	0.47	0.45	0.53	0.47	0.44	0.60
s_R	0.68	0.59	0.69	0.58	0.60	0.73
CV_R	0.76	0.66	0.76	0.65	0.67	0.81
R	1.93	1.67	1.95	1.65	1.71	2.06
HORRAT[1]	0.37	0.32	0.37	0.32	0.33	0.40

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Trockenmasse / dry matter

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 flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

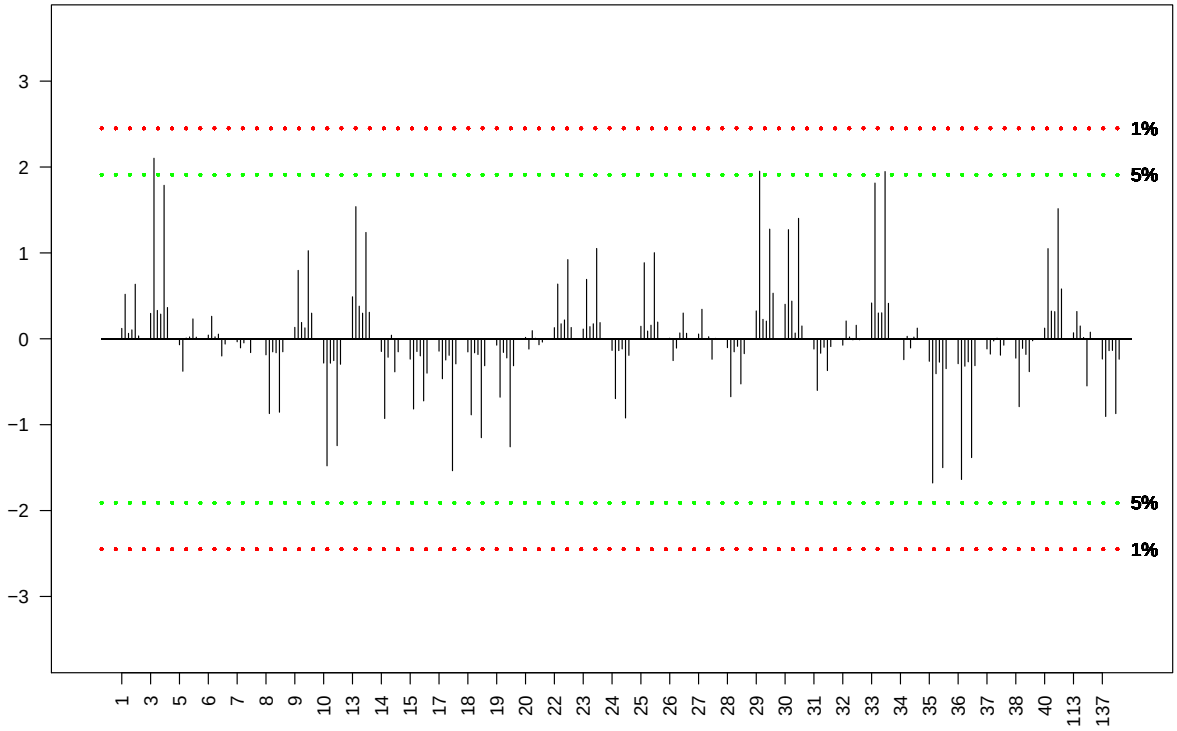
Trockenmasse / dry matter

Labor	2001	2002	2003	2004	2005	2006
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17			C			
18						
19						
20						
22						
23						
24						
25						
26						
27						
28						
29						C
30						
31	C	c				
32						
33						
34						
35						
36						
37						
38						
40				C		c
113						
137						

VDLUFA

Trockenmasse / dry matter

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.

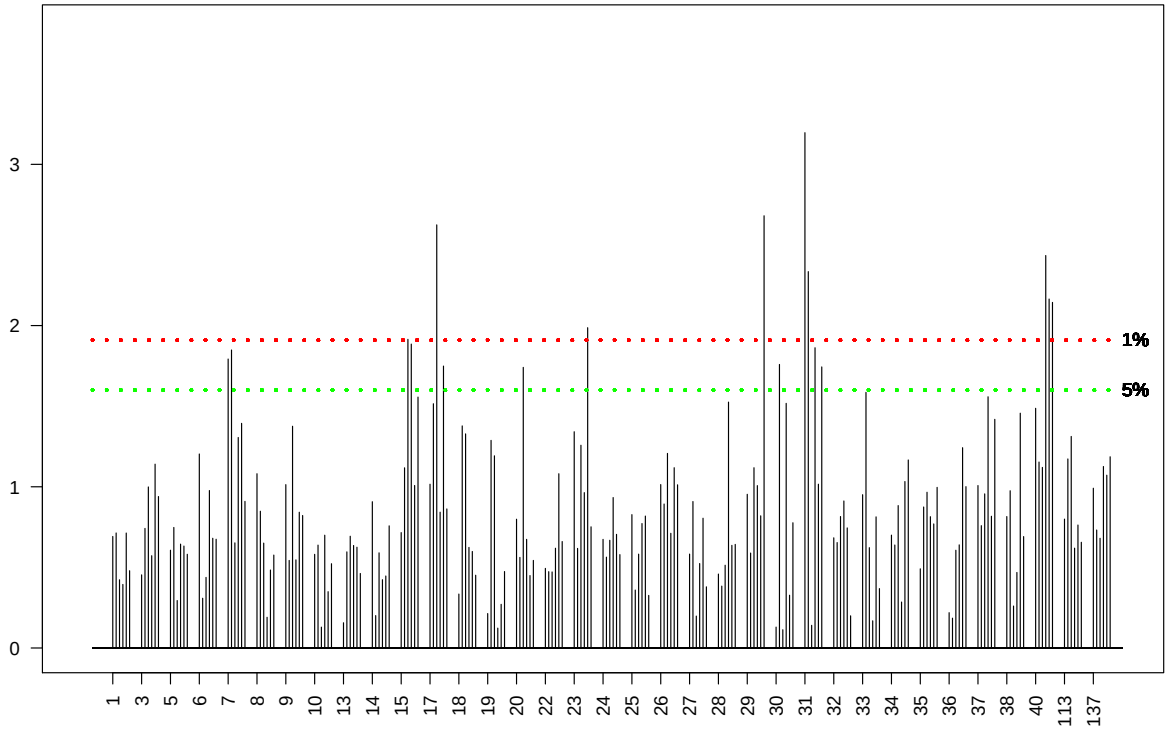
The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

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.

VDLUFA

Trockenmasse / dry matter

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.

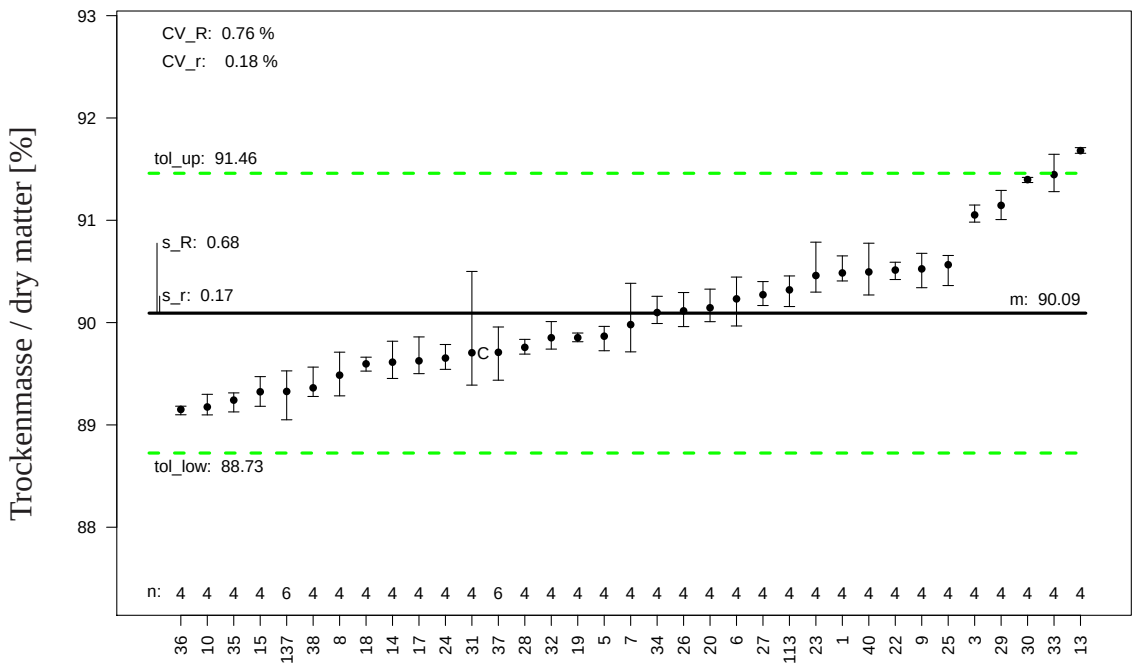
VDLUFA

6.4 Einzelproben / Single Samples

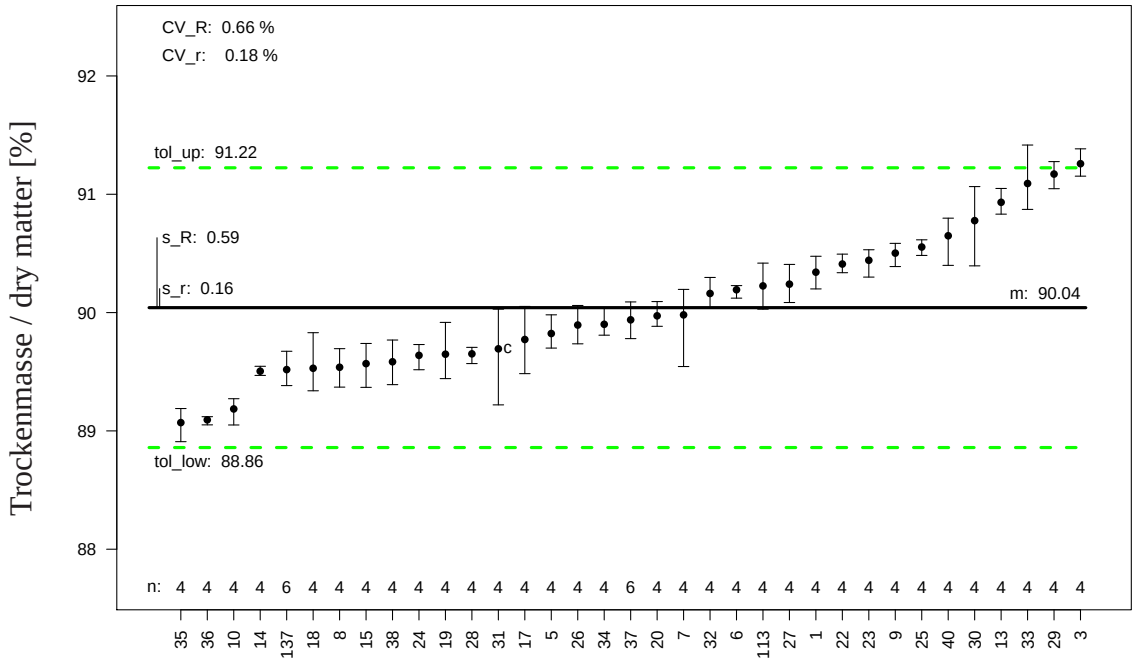
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden -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

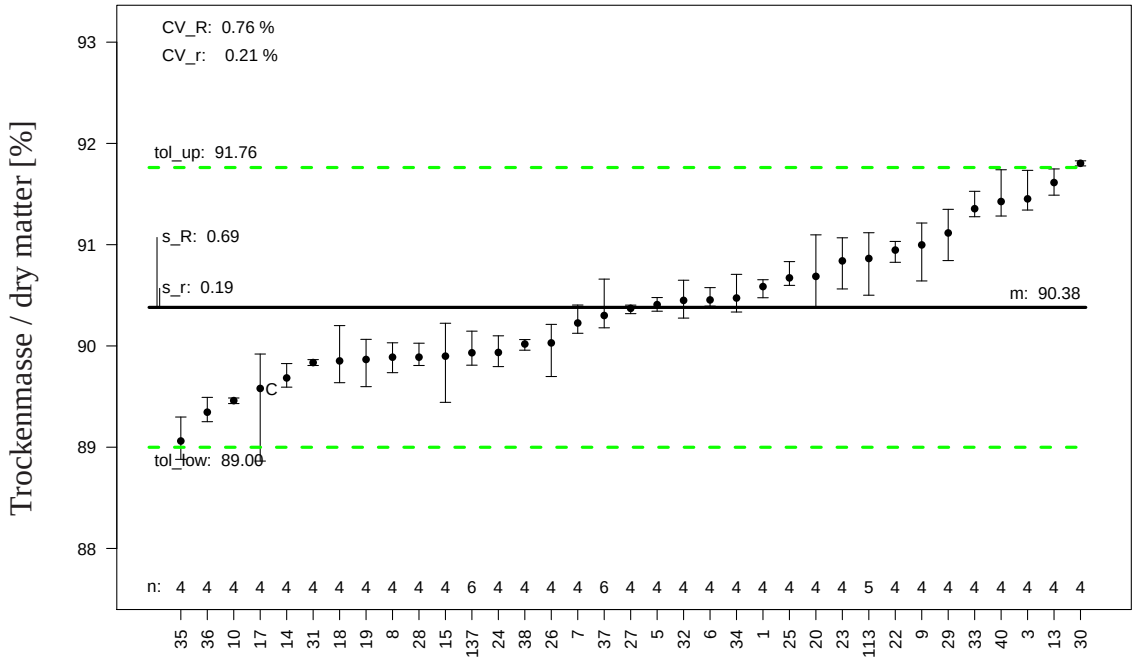
Probe/Sample 2001:



Probe/Sample 2002:



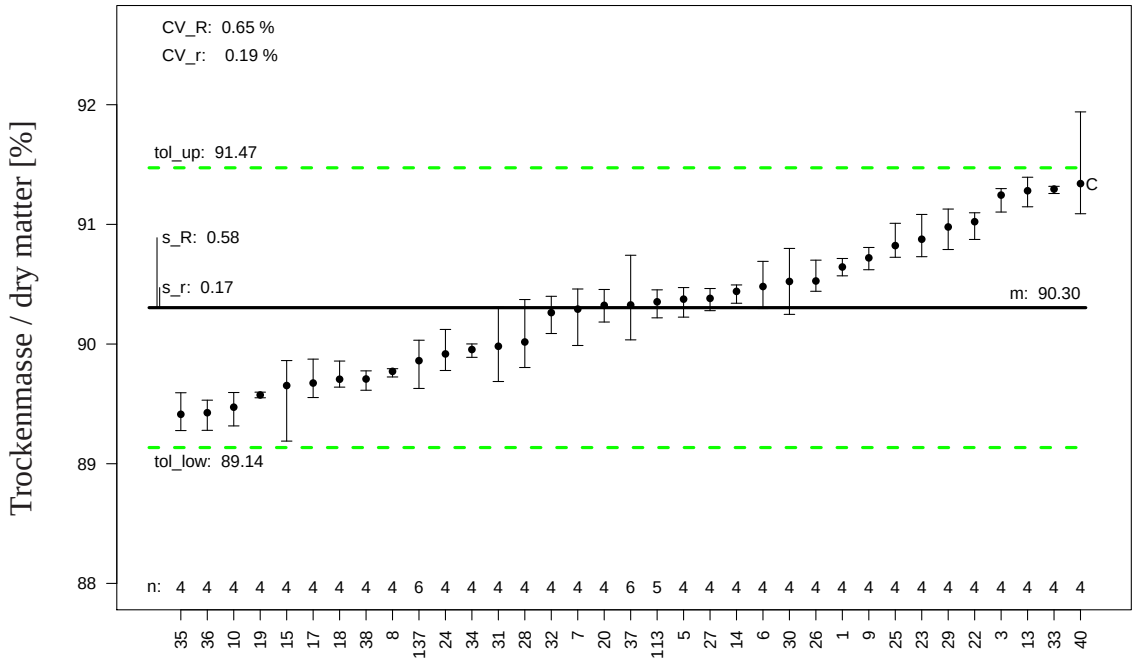
Probe/Sample 2003:



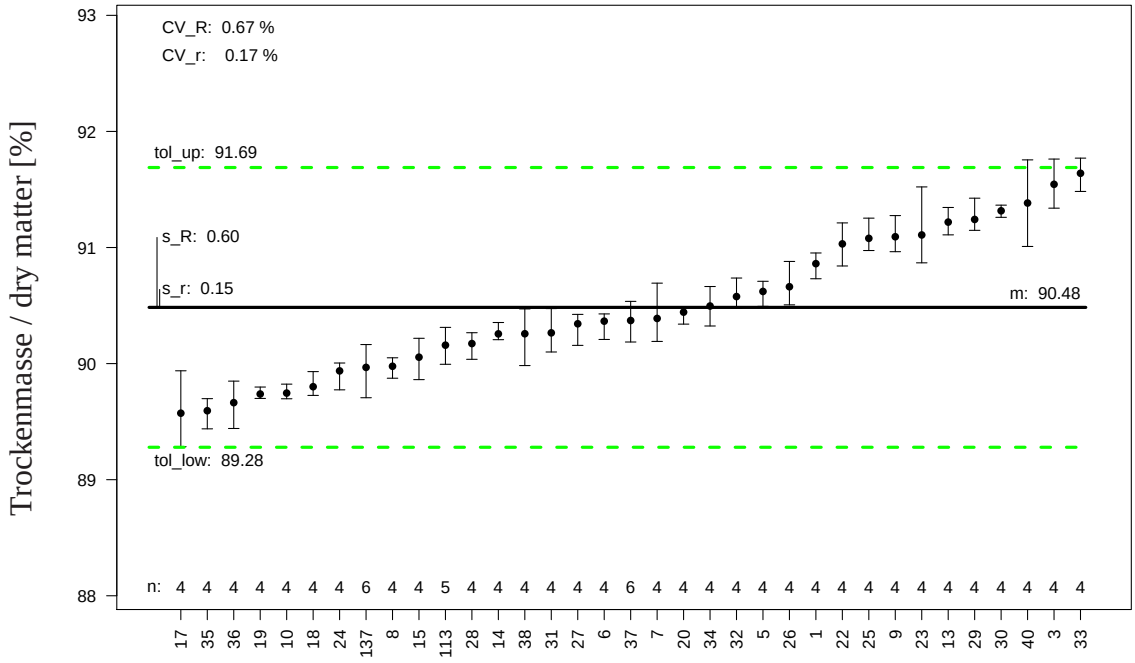
VDLUFA

Trockenmasse / dry matter

Probe/Sample 2004:

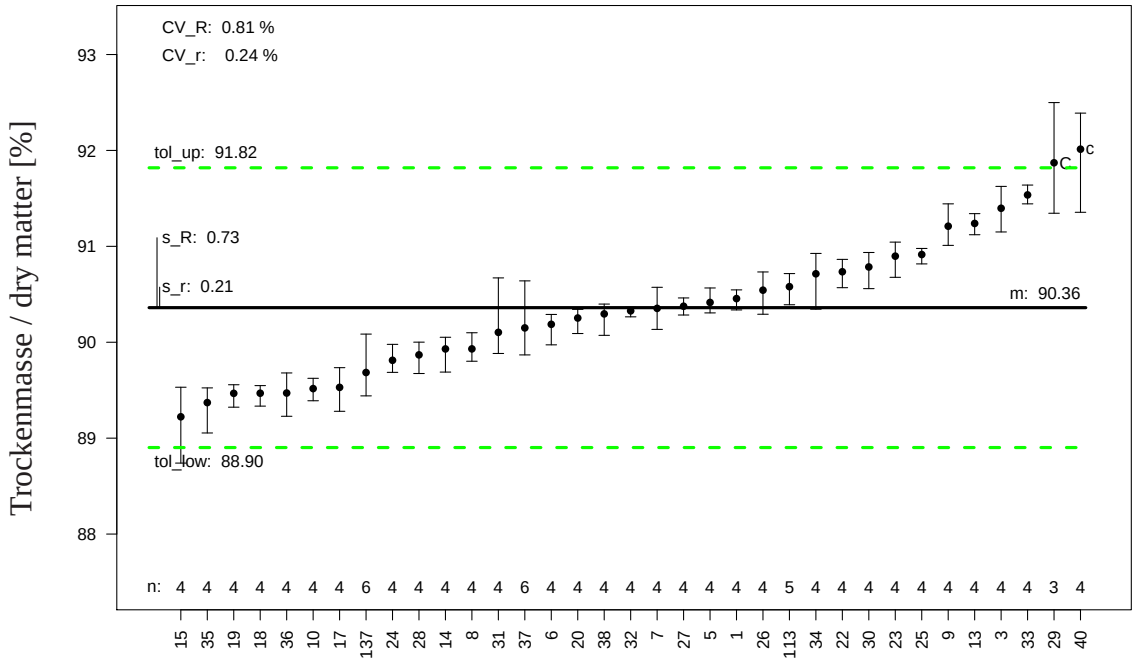


Probe/Sample 2005:



VDLUFA

Probe/Sample 2006:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

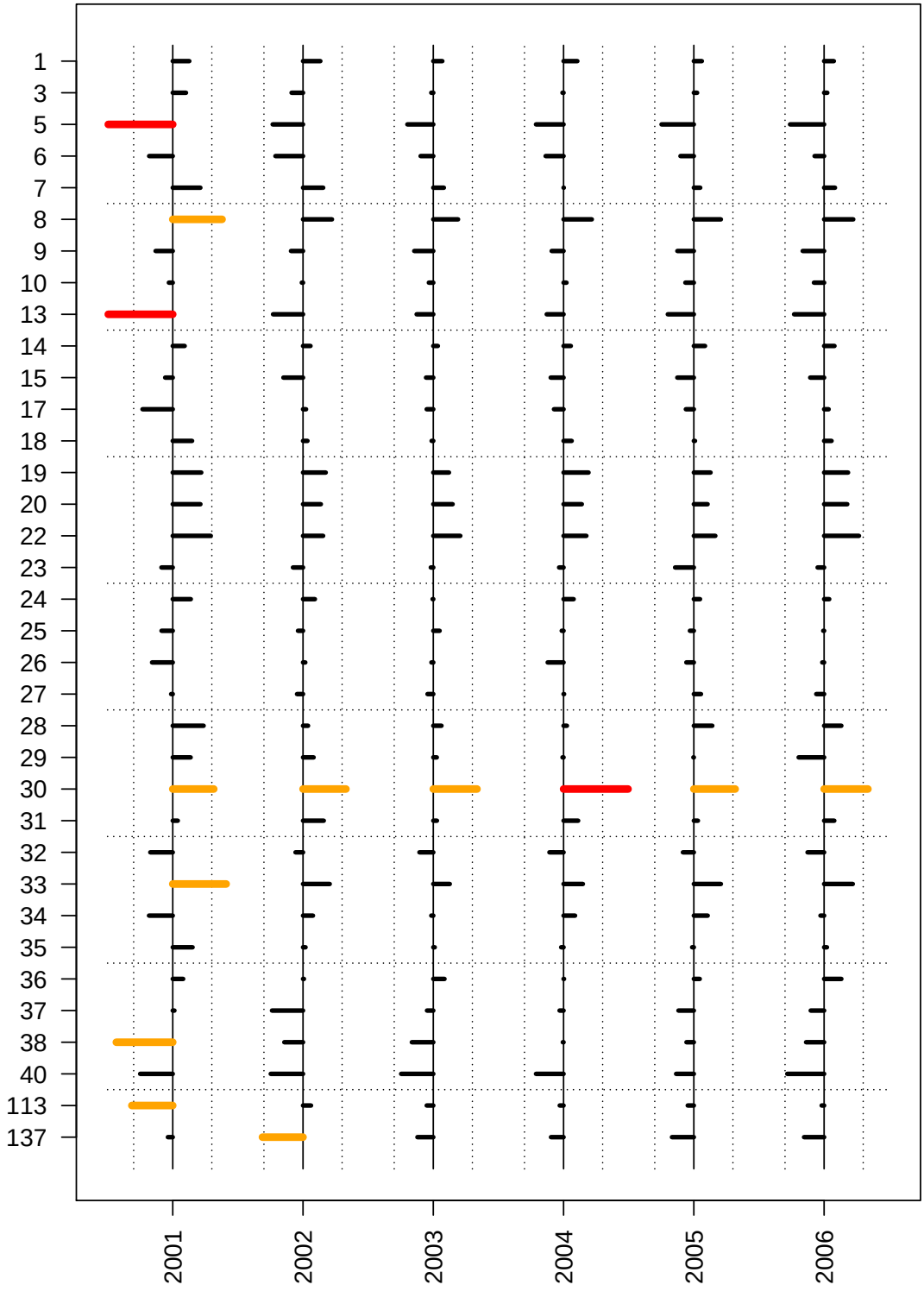
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 0.25 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohprotein / XP

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohprotein / XP

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	6.95	0.21	6.32	0.22	7.22	0.12	7.13	0.18	6.60	0.10	6.50	0.12	**0.16**	**0.18**
3	6.90	0.17	5.95	-0.15	7.08	-0.03	6.94	-0.01	6.54	0.04	6.41	0.04	**0.01**	**0.10**
5	5.96	-0.77	5.71	-0.39	6.78	-0.33	6.60	-0.35	6.08	-0.41	5.94	-0.44	**-0.45**	**0.52**
6	6.43	-0.30	5.74	-0.35	6.94	-0.16	6.72	-0.23	6.33	-0.17	6.25	-0.12	**-0.22**	**0.26**
7	7.09	0.35	6.35	0.26	7.24	0.13	6.95	0.00	6.58	0.08	6.51	0.14	**0.16**	**0.22**
8	7.37	0.63	6.46	0.37	7.42	0.32	7.31	0.36	6.84	0.35	6.75	0.37	**0.40**	**0.45**
9	6.51	-0.22	5.94	-0.15	6.86	-0.24	6.80	-0.15	6.29	-0.21	6.10	-0.27	**-0.21**	**0.23**
10	6.68	-0.05	6.08	-0.02	7.05	-0.06	6.99	0.04	6.39	-0.11	6.24	-0.13	**-0.05**	**0.08**
13	5.94	-0.79	5.71	-0.38	6.89	-0.21	6.74	-0.22	6.17	-0.33	5.99	-0.38	**-0.39**	**0.47**
14	6.89	0.15	6.19	0.10	7.17	0.06	7.04	0.09	6.64	0.14	6.51	0.13	**0.11**	**0.13**
15	6.64	-0.10	5.84	-0.25	7.01	-0.09	6.79	-0.16	6.29	-0.21	6.20	-0.18	**-0.17**	**0.19**
17	6.35	-0.39	6.13	0.04	7.02	-0.08	6.83	-0.12	6.40	-0.10	6.43	0.06	**-0.10**	**0.19**
18	6.98	0.25	6.15	0.06	7.09	-0.02	7.06	0.10	6.51	0.01	6.47	0.10	**0.08**	**0.13**
19	7.10	0.36	6.38	0.29	7.31	0.20	7.27	0.32	6.71	0.21	6.68	0.31	**0.28**	**0.32**
20	7.09	0.35	6.32	0.23	7.35	0.25	7.18	0.23	6.67	0.18	6.67	0.30	**0.26**	**0.29**
22	7.22	0.49	6.35	0.26	7.45	0.35	7.24	0.29	6.77	0.27	6.82	0.45	**0.35**	**0.40**
23	6.59	-0.14	5.97	-0.13	7.08	-0.03	6.89	-0.06	6.26	-0.24	6.29	-0.08	**-0.11**	**0.15**
24	6.97	0.23	6.25	0.15	7.10	-0.01	7.08	0.13	6.58	0.08	6.44	0.07	**0.11**	**0.14**
25	6.59	-0.14	6.03	-0.06	7.19	0.08	6.93	-0.02	6.45	-0.05	6.36	-0.01	**-0.04**	**0.08**
26	6.47	-0.26	6.12	0.03	7.08	-0.02	6.75	-0.20	6.40	-0.10	6.35	-0.02	**-0.10**	**0.16**
27	6.71	-0.02	6.02	-0.08	7.03	-0.07	6.96	0.01	6.59	0.09	6.27	-0.10	**-0.03**	**0.08**
28	7.13	0.39	6.16	0.06	7.21	0.10	6.99	0.04	6.73	0.24	6.59	0.22	**0.18**	**0.24**
29	6.96	0.23	6.23	0.14	7.15	0.04	6.94	-0.01	6.49	-0.01	6.05	-0.33	**0.01**	**0.19**
30	7.26	0.52	6.64	0.55	7.67	0.56	7.79	0.84	7.03	0.53	6.93	0.56	**0.59**	**0.66**
31	6.80	0.06	6.36	0.27	7.15	0.05	7.14	0.19	6.55	0.05	6.50	0.13	**0.12**	**0.16**
32	6.45	-0.29	6.00	-0.10	6.93	-0.18	6.77	-0.18	6.36	-0.14	6.16	-0.21	**-0.18**	**0.21**
33	7.42	0.68	6.44	0.34	7.32	0.21	7.20	0.25	6.84	0.35	6.74	0.37	**0.37**	**0.43**
34	6.43	-0.30	6.22	0.13	7.08	-0.03	7.10	0.15	6.68	0.18	6.33	-0.05	**0.01**	**0.18**
35	6.99	0.25	6.13	0.03	7.13	0.02	6.92	-0.03	6.48	-0.02	6.41	0.04	**0.05**	**0.12**
36	6.87	0.13	6.11	0.01	7.25	0.14	6.96	0.01	6.57	0.08	6.59	0.22	**0.10**	**0.14**
37	6.76	0.02	5.70	-0.40	7.03	-0.08	6.90	-0.05	6.30	-0.20	6.20	-0.17	**-0.15**	**0.22**
38	6.01	-0.72	5.85	-0.24	6.83	-0.27	6.94	-0.01	6.40	-0.09	6.14	-0.23	**-0.26**	**0.38**
40	6.32	-0.42	5.68	-0.41	6.70	-0.41	6.60	-0.35	6.27	-0.23	5.90	-0.47	**-0.38**	**0.43**
113	6.21	-0.52	6.20	0.10	7.02	-0.08	6.90	-0.05	6.42	-0.08	6.34	-0.03	**-0.11**	**0.25**
137	6.67	-0.06	5.57	-0.52	6.90	-0.20	6.79	-0.16	6.22	-0.28	6.12	-0.26	**-0.25**	**0.31**

[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*

VDLUFA

7.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	141	145	143	
p_1	35	35	35	34	35	35	
m	6.73	6.09	7.11	6.95	6.50	6.37	
s_r	0.15	0.09	0.10	0.12	0.10	0.09	
CV_r	2.26	1.51	1.45	1.68	1.48	1.42	
r	0.43	0.26	0.29	0.33	0.27	0.26	
s_R	0.40	0.28	0.22	0.21	0.23	0.26	0.25
CV_R	5.97	4.55	3.06	2.96	3.50	4.12	
R	1.14	0.79	0.62	0.58	0.64	0.74	0.71
HORRAT[1]	1.99	1.49	1.03	0.99	1.16	1.36	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohprotein / XP

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 flaged as an outlier for a sample.

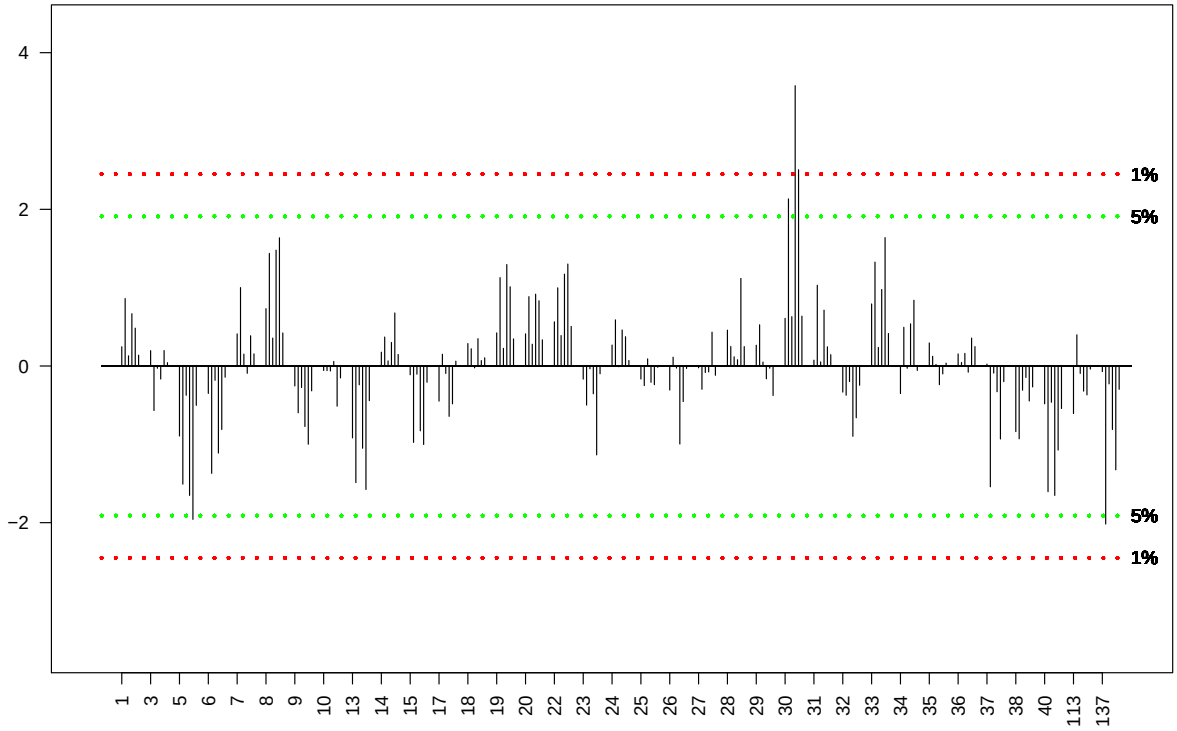
VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23						
24						
25						
26						
27						
28					c	
29						
30				B		
31	C					
32						
33						
34						
35						
36						
37						
38						
40	C		C	c		
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohprotein / XP

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.

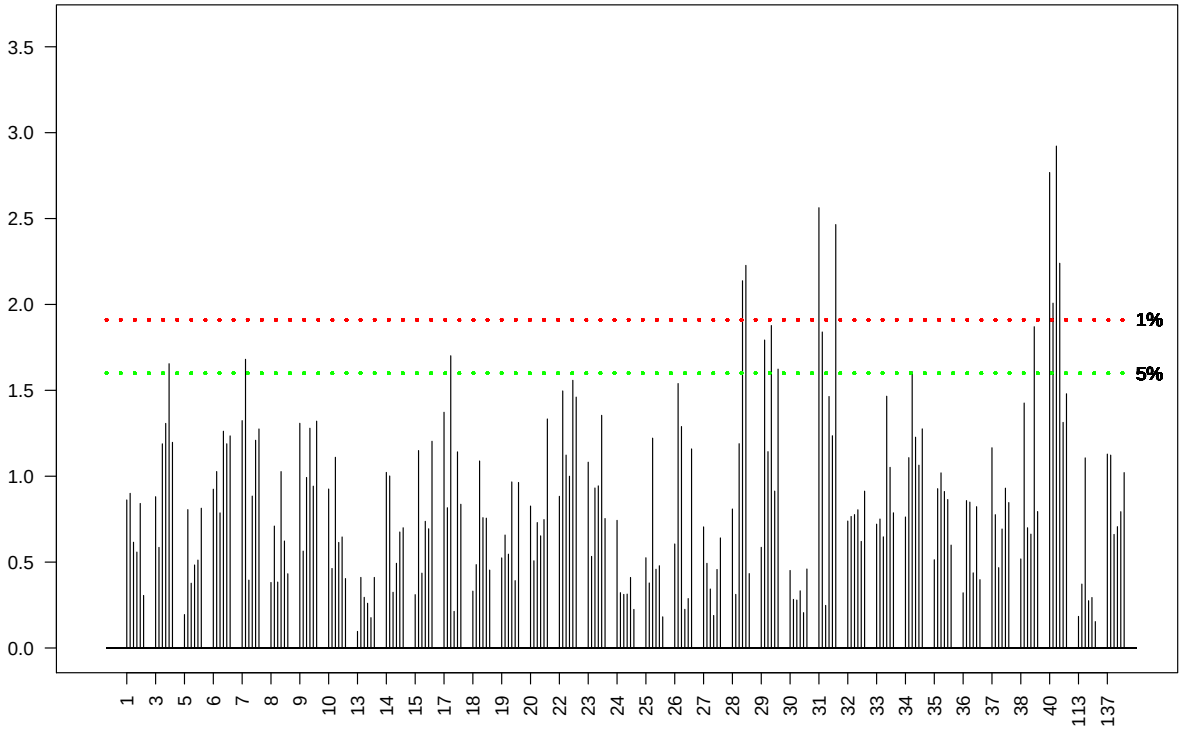
The labs are ordered horizontally with a bar for each sample. The bar for the first sample from one lab always start at the whole number, i.e. for lab 5 at 5.0.

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.

VDLUFA

Rohprotein / XP

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.

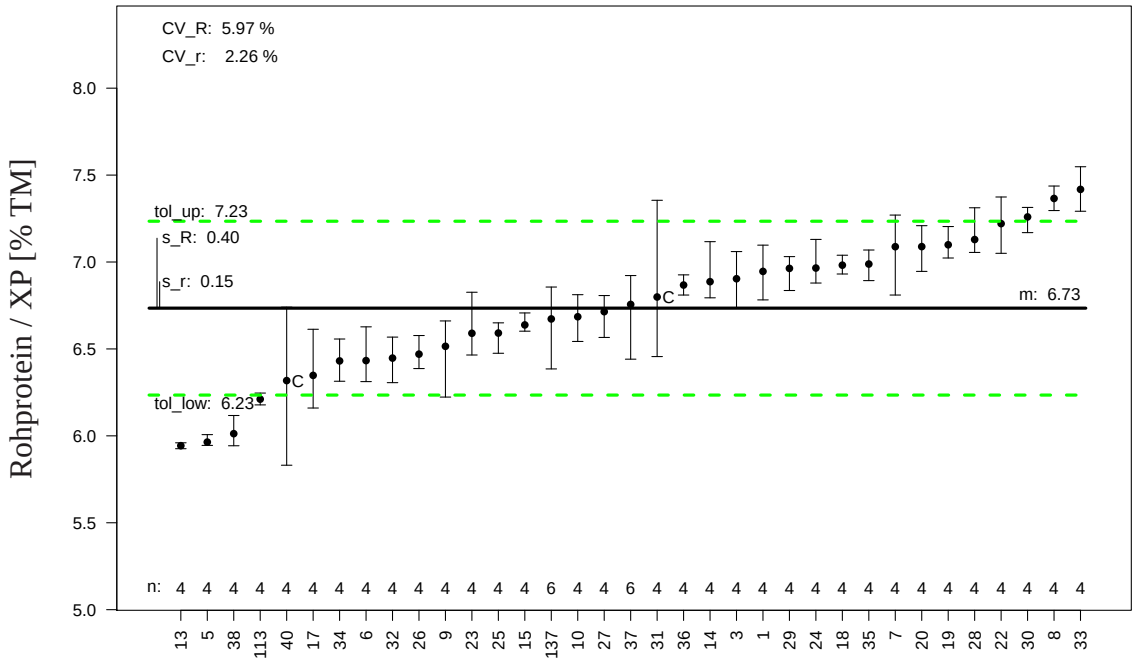
VDLUFA

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.

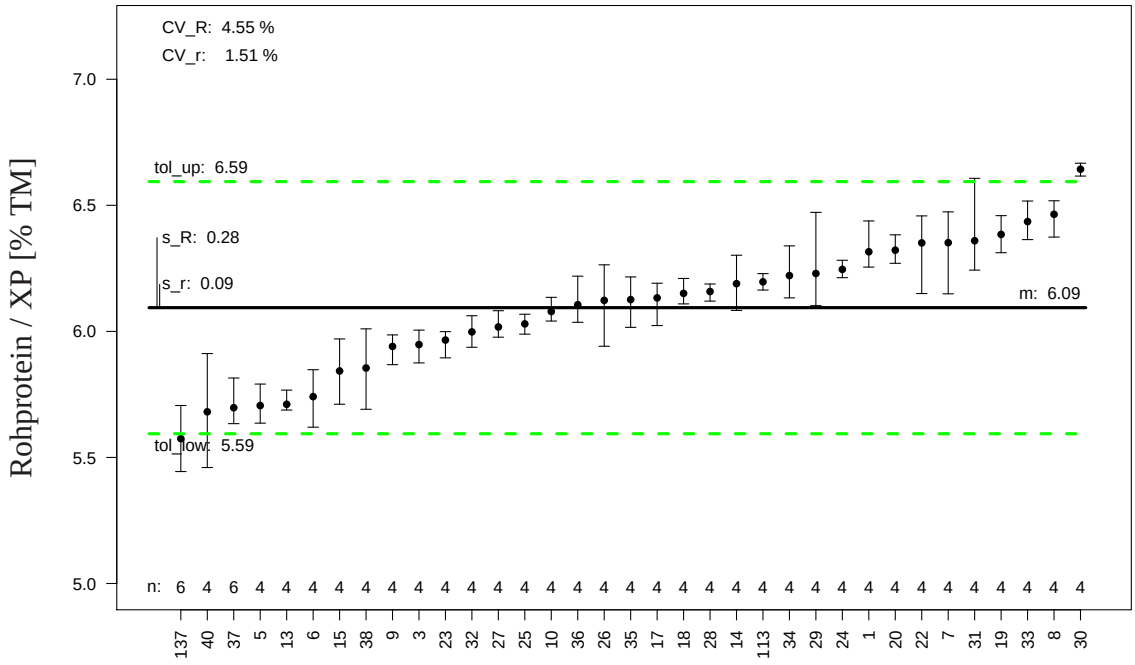
The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency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

Probe/Sample 2001:

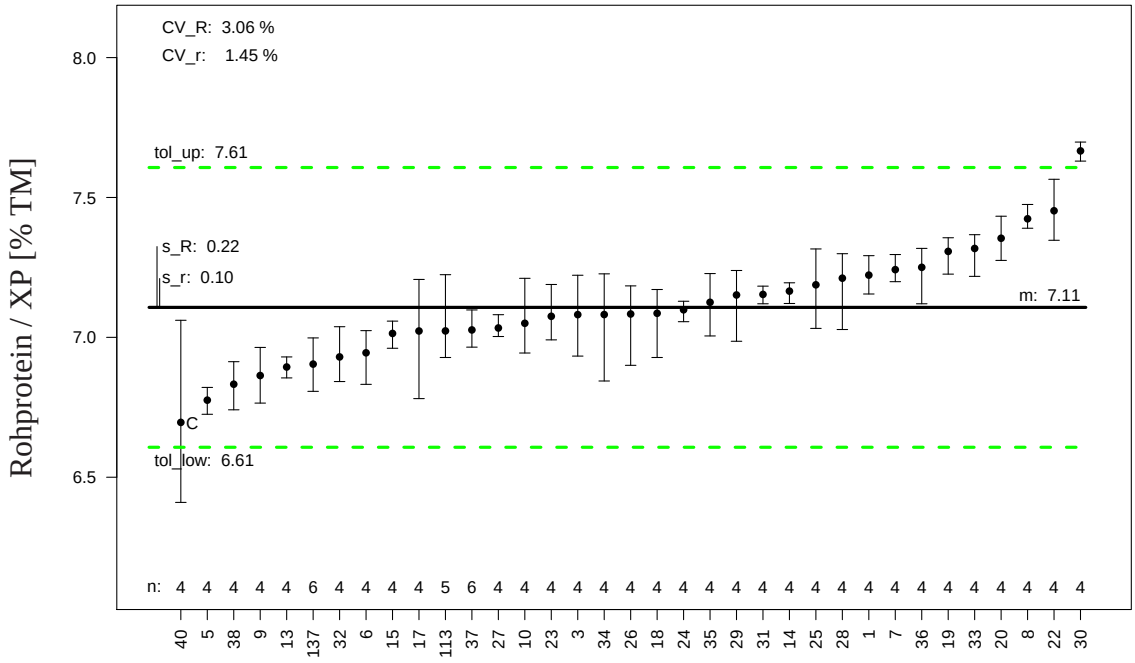


VDLUFA

Probe/Sample 2002:

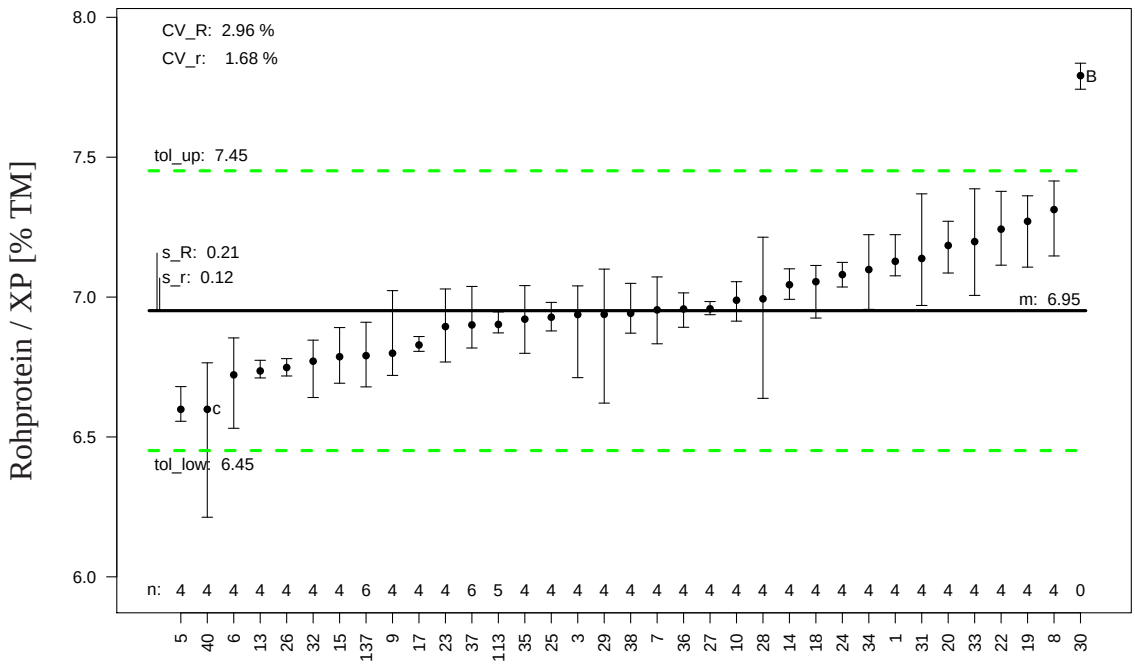


Probe/Sample 2003:

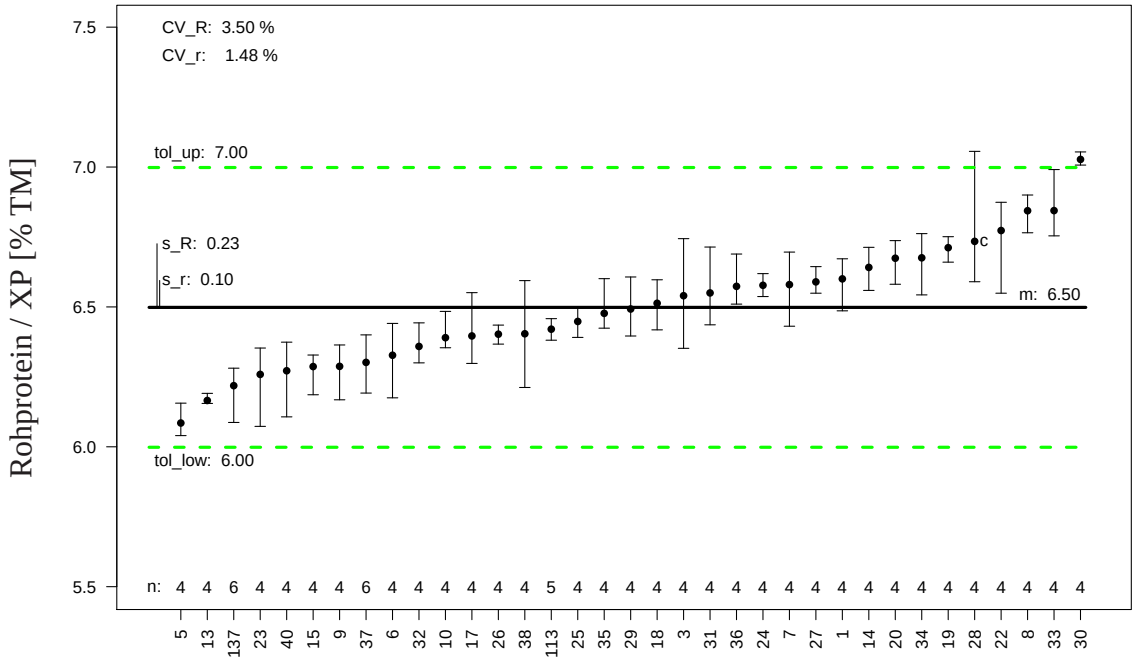


VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Probe/Sample 2004:

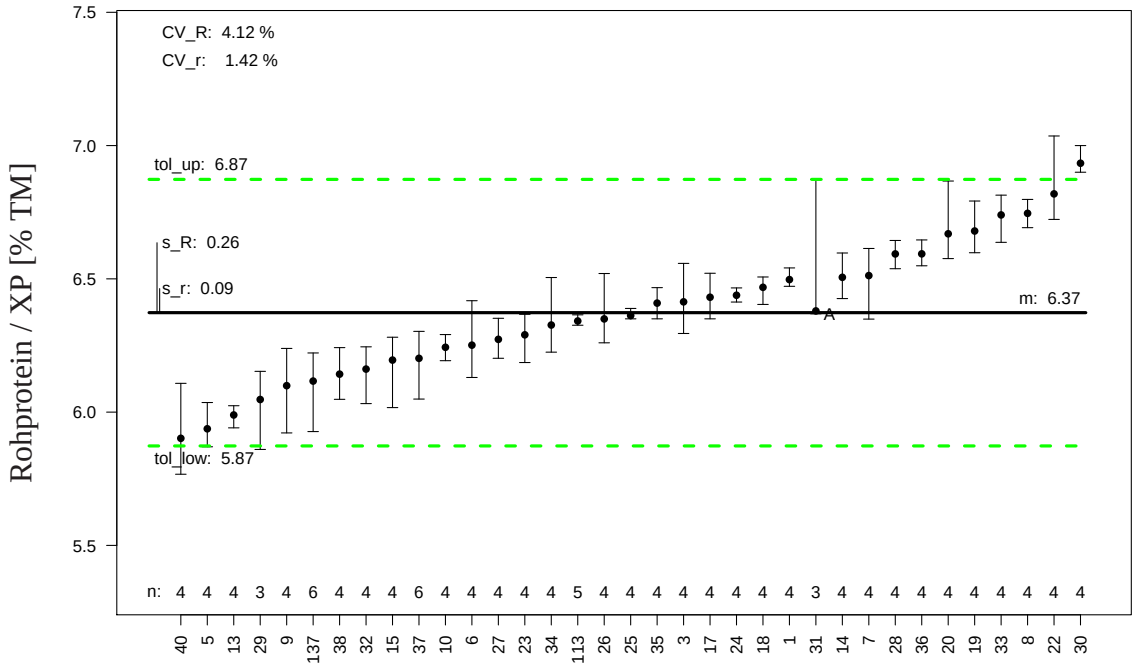


Probe/Sample 2005:



VDLUFA

Probe/Sample 2006:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

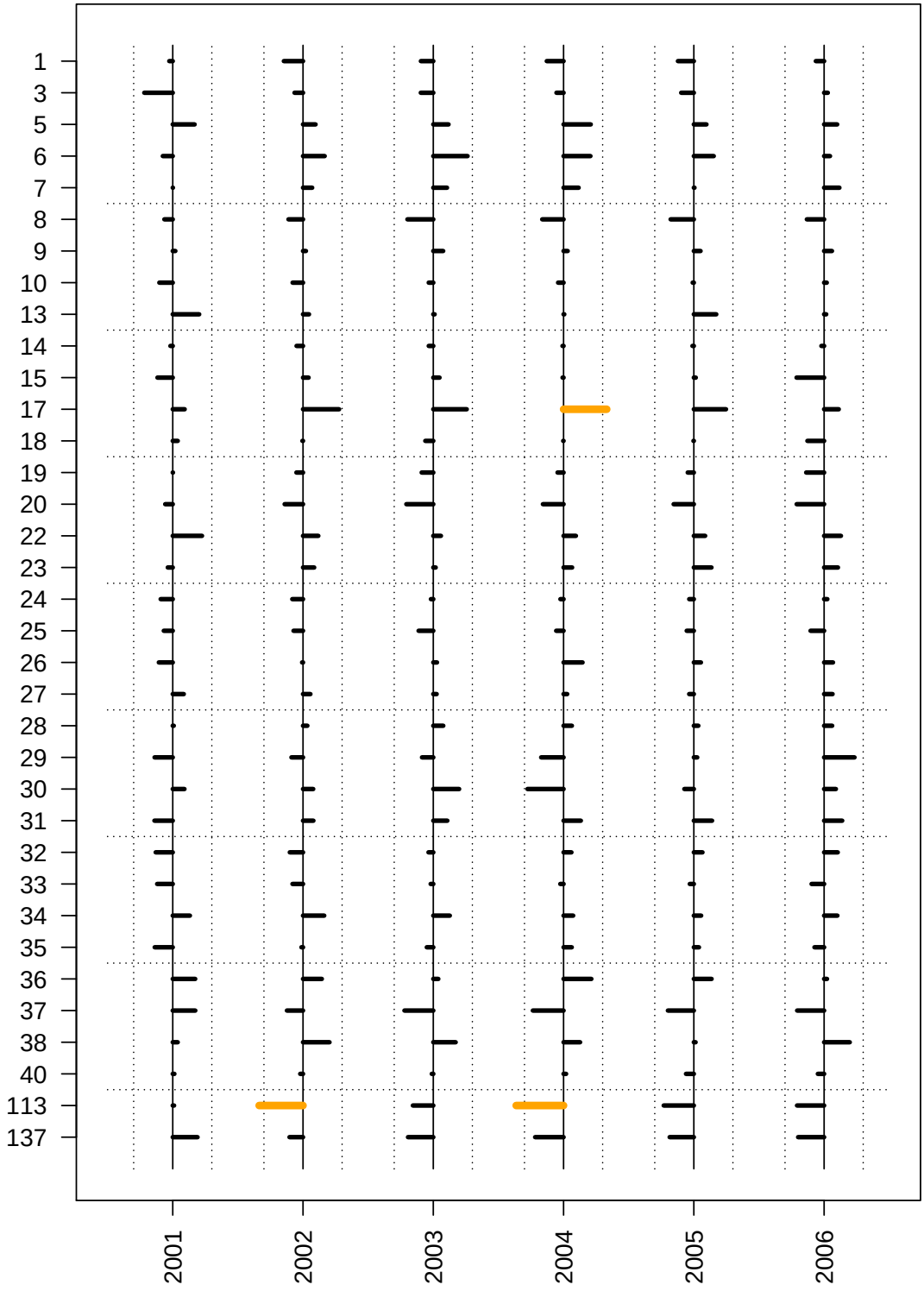
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohfaser / XF

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohfaser / XF

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	26.95	-0.18	17.03	-0.98	15.38	-0.63	15.06	-0.86	15.42	-0.81	16.27	-0.42	**-0.65**	**0.77**
3	25.67	-1.46	17.58	-0.43	15.37	-0.64	15.56	-0.36	15.59	-0.65	16.88	0.19	**-0.56**	**0.81**
5	28.25	1.12	18.65	0.64	16.79	0.78	17.31	1.39	16.88	0.65	17.36	0.67	**0.87**	**1.01**
6	26.62	-0.51	19.12	1.11	17.77	1.75	17.29	1.37	17.26	1.02	16.99	0.30	**0.84**	**1.23**
7	27.14	0.01	18.48	0.47	16.71	0.70	16.69	0.77	16.27	0.03	17.47	0.78	**0.46**	**0.62**
8	26.70	-0.43	17.27	-0.74	14.69	-1.32	14.83	-1.09	15.05	-1.19	15.81	-0.88	**-0.94**	**1.08**
9	27.26	0.13	18.16	0.15	16.52	0.51	16.13	0.21	16.58	0.34	17.09	0.40	**0.29**	**0.35**
10	26.45	-0.69	17.48	-0.53	15.78	-0.23	15.64	-0.28	16.18	-0.06	16.82	0.13	**-0.28**	**0.43**
13	28.48	1.35	18.31	0.30	16.08	0.07	15.96	0.04	17.39	1.15	16.80	0.11	**0.50**	**0.81**
14	27.01	-0.12	17.68	-0.33	15.78	-0.23	15.87	-0.05	16.17	-0.07	16.55	-0.14	**-0.16**	**0.20**
15	26.35	-0.78	18.29	0.28	16.33	0.32	15.87	-0.05	16.34	0.10	15.28	-1.41	**-0.26**	**0.75**
17	27.74	0.61	19.85	1.84	17.72	1.71	18.13	2.21	17.88	1.65	17.44	0.75	**1.46**	**1.72**
18	27.39	0.25	17.98	-0.03	15.60	-0.41	15.90	-0.02	16.22	-0.02	15.84	-0.85	**-0.18**	**0.44**
19	27.14	0.01	17.67	-0.34	15.42	-0.59	15.61	-0.31	15.93	-0.31	15.77	-0.92	**-0.41**	**0.55**
20	26.75	-0.38	17.07	-0.94	14.63	-1.38	14.86	-1.06	15.21	-1.03	15.29	-1.40	**-1.03**	**1.19**
22	28.63	1.50	18.79	0.78	16.40	0.39	16.55	0.63	16.82	0.58	17.55	0.86	**0.79**	**0.95**
23	26.88	-0.25	18.58	0.57	16.13	0.12	16.36	0.44	17.14	0.90	17.40	0.71	**0.41**	**0.62**
24	26.51	-0.62	17.46	-0.55	15.89	-0.12	15.76	-0.16	16.00	-0.24	16.85	0.16	**-0.25**	**0.40**
25	26.67	-0.46	17.53	-0.48	15.26	-0.75	15.54	-0.38	15.87	-0.36	16.00	-0.69	**-0.52**	**0.59**
26	26.42	-0.71	17.96	-0.05	16.20	0.19	16.89	0.97	16.60	0.36	17.14	0.45	**0.20**	**0.60**
27	27.69	0.56	18.39	0.38	16.18	0.17	16.10	0.18	16.00	-0.24	17.12	0.43	**0.25**	**0.39**
28	27.18	0.05	18.23	0.22	16.52	0.51	16.34	0.42	16.47	0.23	17.10	0.41	**0.31**	**0.38**
29	26.20	-0.93	17.42	-0.59	15.44	-0.58	14.77	-1.14	16.41	0.17	18.24	1.55	**-0.25**	**1.03**
30	27.73	0.60	18.53	0.52	17.33	1.32	14.07	-1.84	15.75	-0.49	17.29	0.60	**0.12**	**1.13**
31	26.19	-0.94	18.54	0.53	16.73	0.72	16.80	0.88	17.17	0.93	17.62	0.93	**0.51**	**0.91**
32	26.26	-0.87	17.33	-0.68	15.77	-0.25	16.32	0.40	16.68	0.44	17.39	0.70	**-0.04**	**0.65**
33	26.33	-0.80	17.47	-0.54	15.88	-0.13	15.75	-0.17	16.03	-0.21	16.05	-0.64	**-0.41**	**0.53**
34	28.01	0.88	19.09	1.08	16.86	0.84	16.41	0.49	16.61	0.37	17.37	0.68	**0.72**	**0.84**
35	26.21	-0.92	17.93	-0.08	15.68	-0.33	16.34	0.42	16.50	0.26	16.20	-0.49	**-0.19**	**0.54**
36	28.28	1.15	18.97	0.96	16.27	0.26	17.34	1.42	17.15	0.91	16.84	0.15	**0.81**	**1.02**
37	28.28	1.15	17.19	-0.82	14.54	-1.48	14.35	-1.57	14.91	-1.33	15.31	-1.38	**-0.90**	**1.44**
38	27.38	0.25	19.36	1.35	17.16	1.14	16.76	0.84	16.33	0.09	18.00	1.31	**0.83**	**1.06**
40	27.21	0.08	17.87	-0.14	15.94	-0.08	16.05	0.13	15.84	-0.40	16.37	-0.32	**-0.12**	**0.25**
113	27.20	0.07	15.76	-2.25	14.97	-1.04	13.49	-2.43	14.70	-1.54	15.30	-1.39	**-1.43**	**1.81**
137	28.40	1.27	17.32	-0.69	14.72	-1.29	14.46	-1.45	15.00	-1.24	15.36	-1.33	**-0.79**	**1.35**

[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*

VDLUFA

8.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	145	145	144	
p_1	35	35	35	35	35	35	
m	27.13	18.01	16.01	15.92	16.24	16.69	
s_r	0.52	0.38	0.46	0.41	0.46	0.52	
CV_r	1.93	2.12	2.85	2.59	2.81	3.10	
r	1.48	1.08	1.29	1.17	1.29	1.47	
s_R	0.92	0.87	0.94	1.10	0.87	0.96	1.00
CV_R	3.37	4.83	5.88	6.88	5.38	5.75	
R	2.59	2.46	2.66	3.10	2.47	2.72	2.83
HORRAT[1]	1.38	1.87	2.23	2.61	2.05	2.20	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

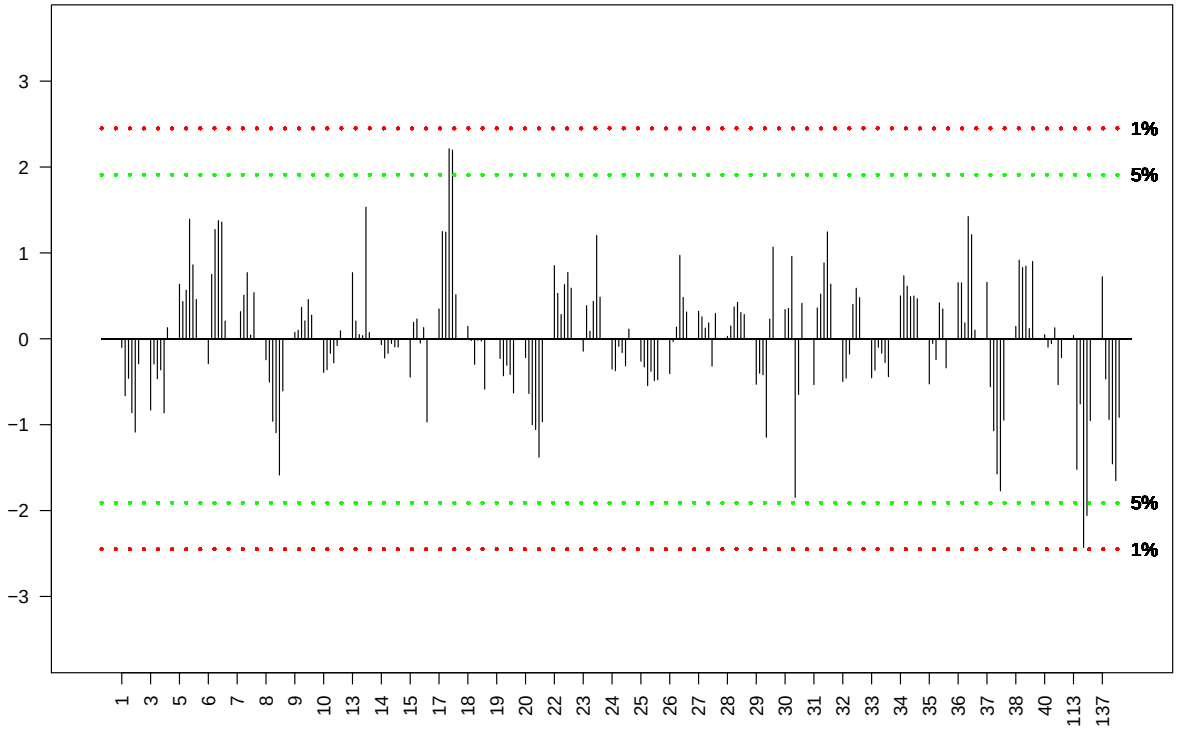
In the following table each lab is marked which was flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	2001	2002	2003	2004	2005	2006
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23			C			
24						
25						
26			C			
27						
28						
29						
30						
31	C	C				
32						
33						
34						
35						
36						
37						
38		C				C
40	C					C
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

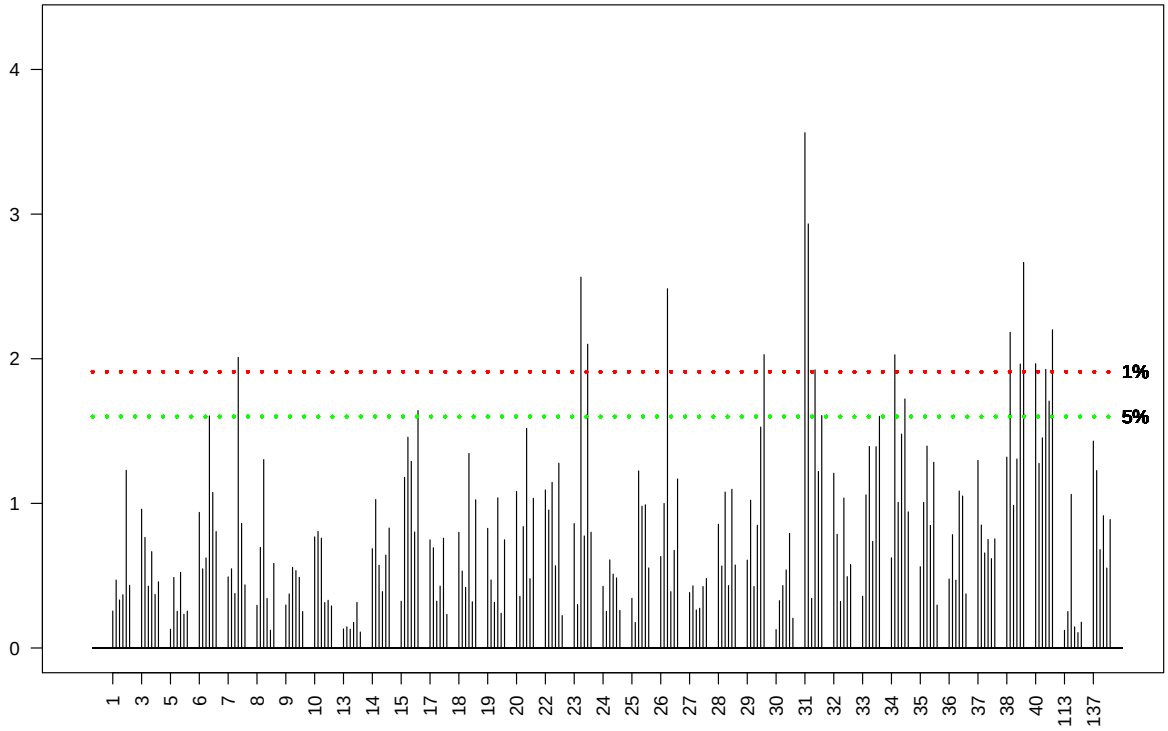
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA

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.

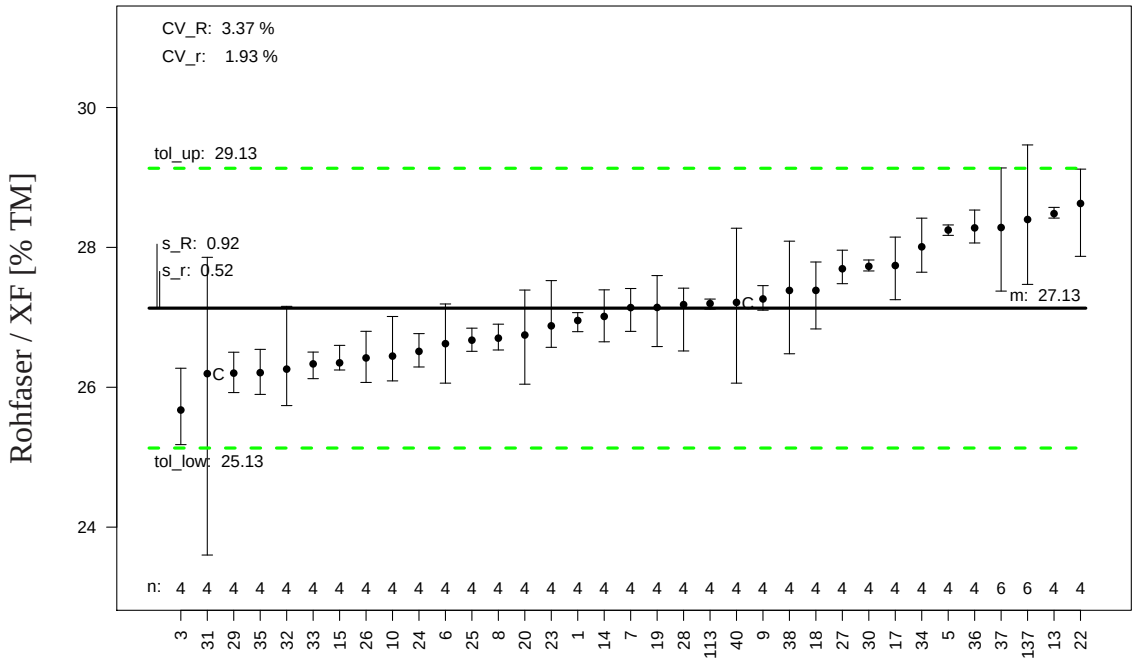
VDLUFA

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.

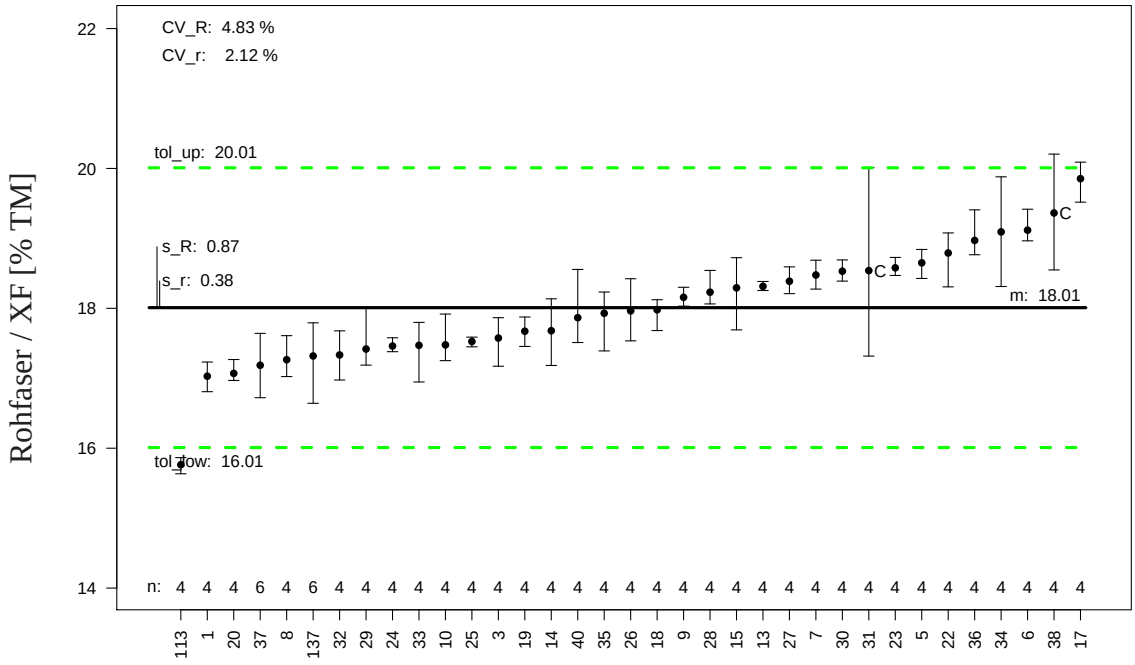
The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency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

Probe/Sample 2001:

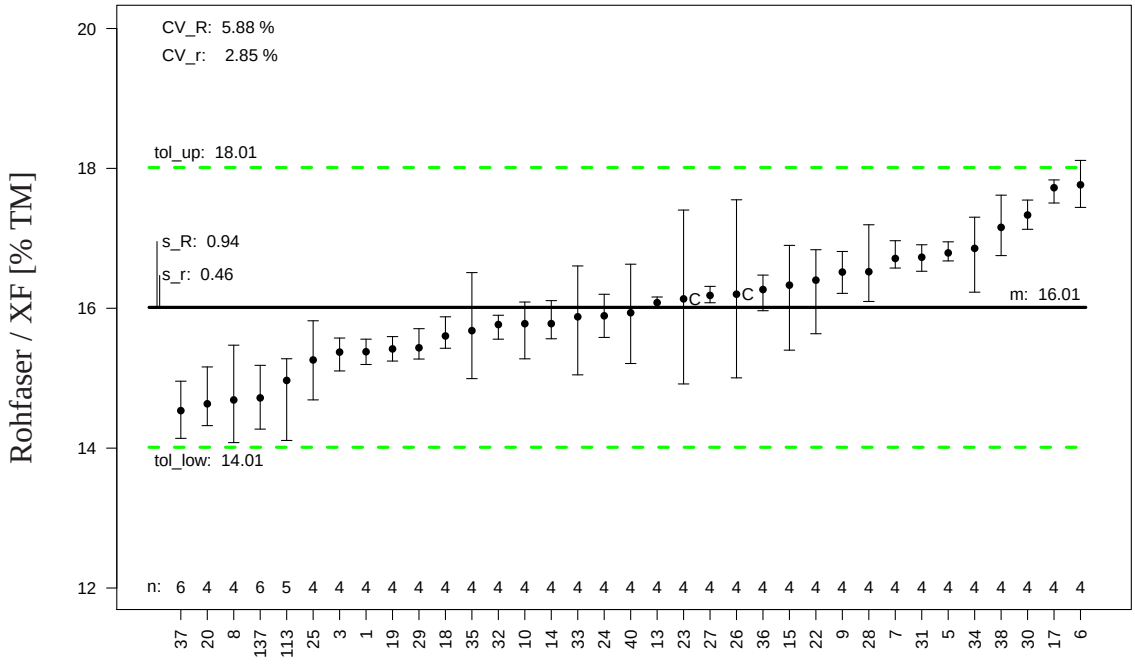


VDLUFA

Probe/Sample 2002:

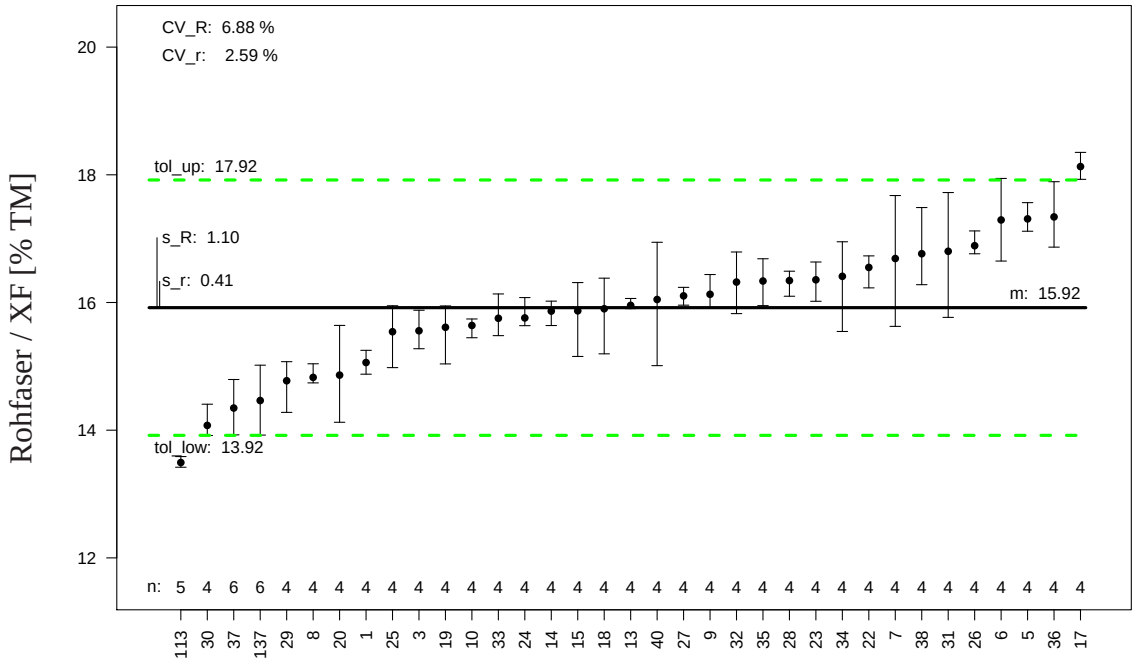


Probe/Sample 2003:

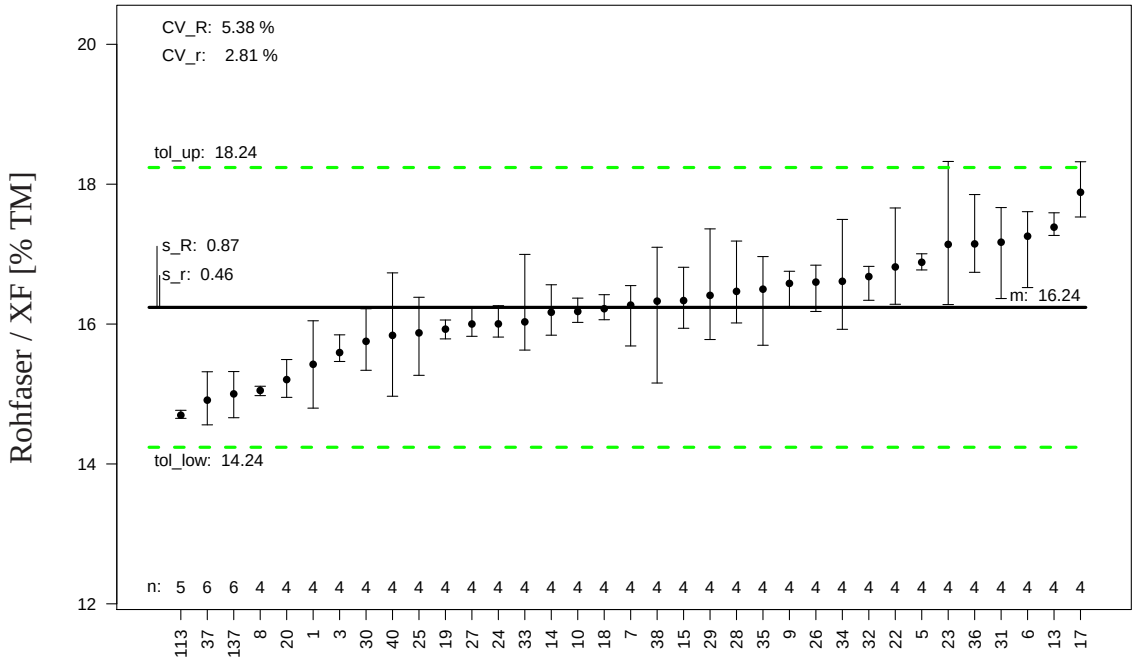


VDLUFA

Probe/Sample 2004:

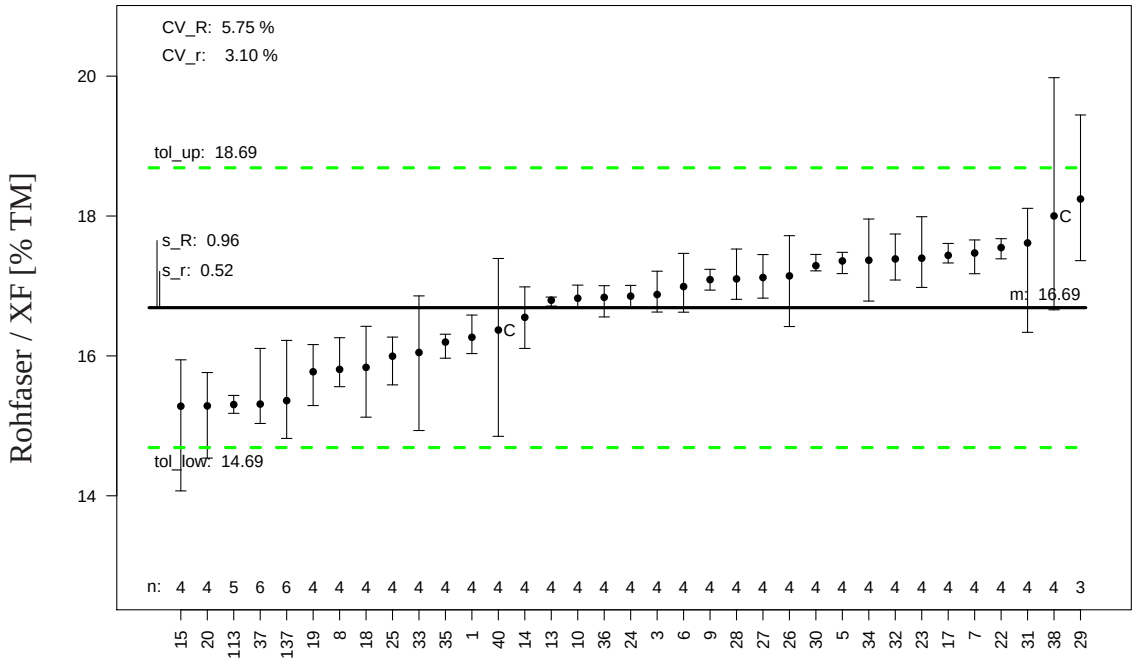


Probe/Sample 2005:



VDLUFA

Probe/Sample 2006:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

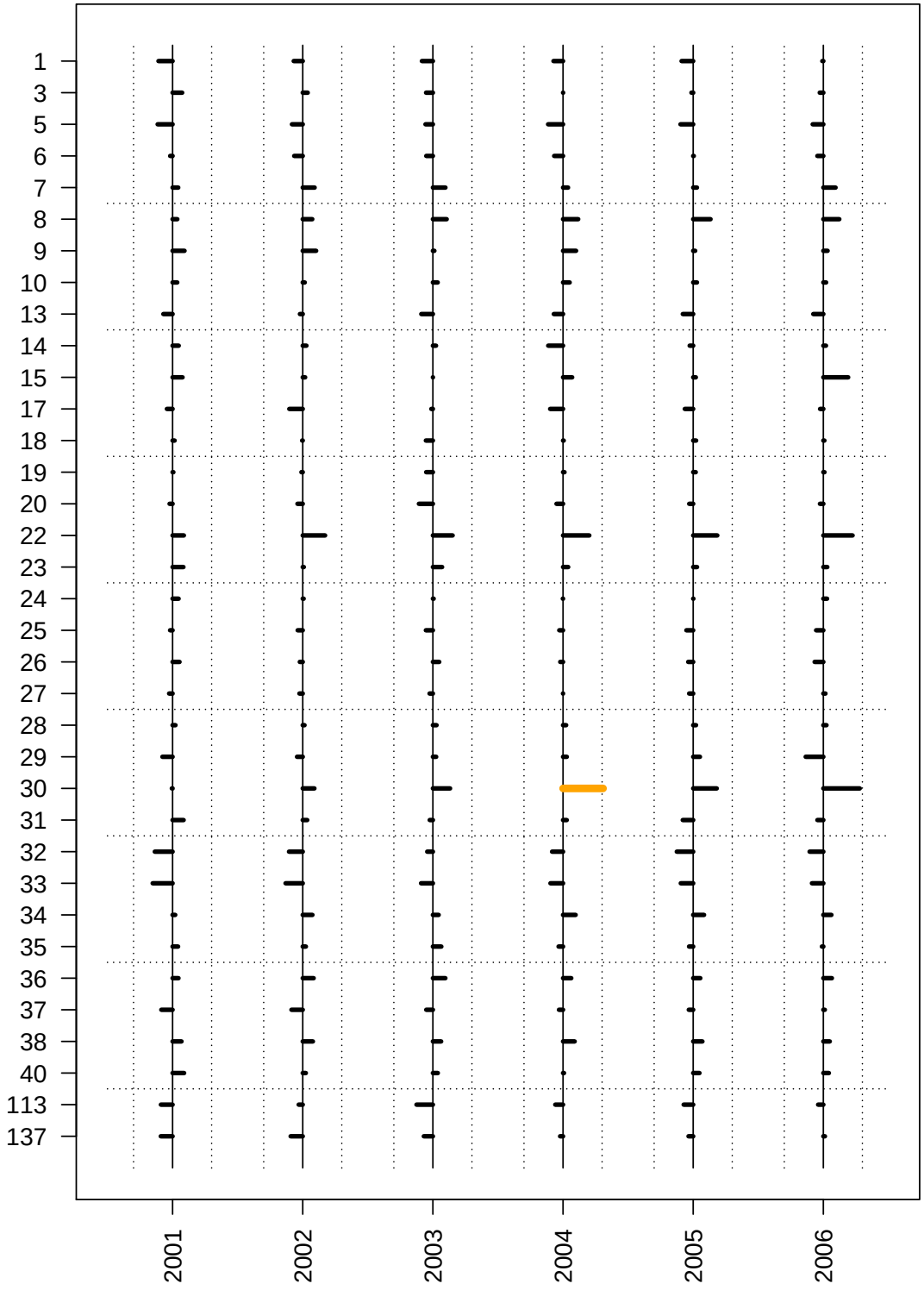
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 0.3 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Rohfett / XL

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	1.69	-0.22	2.52	-0.14	2.54	-0.17	2.65	-0.15	2.54	-0.18	2.85	-0.02	**-0.14**	**0.17**
3	2.05	0.15	2.73	0.08	2.61	-0.10	2.80	0.00	2.69	-0.03	2.81	-0.06	**0.01**	**0.09**
5	1.67	-0.23	2.49	-0.17	2.60	-0.11	2.57	-0.23	2.52	-0.20	2.71	-0.16	**-0.18**	**0.21**
6	1.87	-0.04	2.52	-0.13	2.61	-0.10	2.66	-0.14	2.72	0.01	2.78	-0.09	**-0.08**	**0.11**
7	1.99	0.09	2.84	0.18	2.91	0.19	2.88	0.08	2.77	0.06	3.06	0.19	**0.13**	**0.16**
8	1.98	0.07	2.80	0.15	2.93	0.21	3.03	0.23	2.98	0.27	3.11	0.25	**0.20**	**0.23**
9	2.09	0.18	2.86	0.21	2.74	0.02	3.00	0.20	2.75	0.03	2.93	0.07	**0.12**	**0.16**
10	1.97	0.07	2.69	0.03	2.79	0.07	2.90	0.10	2.77	0.06	2.91	0.04	**0.06**	**0.07**
13	1.76	-0.14	2.61	-0.04	2.54	-0.18	2.66	-0.14	2.56	-0.16	2.71	-0.15	**-0.14**	**0.16**
14	2.00	0.09	2.71	0.06	2.76	0.05	2.57	-0.23	2.66	-0.05	2.91	0.04	**-0.01**	**0.12**
15	2.06	0.15	2.69	0.04	2.71	0.00	2.94	0.14	2.76	0.04	3.25	0.38	**0.13**	**0.20**
17	1.82	-0.09	2.45	-0.21	2.69	-0.02	2.60	-0.20	2.59	-0.13	2.82	-0.05	**-0.12**	**0.15**
18	1.93	0.03	2.65	-0.01	2.61	-0.11	2.81	0.01	2.76	0.04	2.88	0.02	**-0.00**	**0.05**
19	1.91	0.01	2.63	-0.02	2.61	-0.10	2.82	0.02	2.75	0.04	2.89	0.02	**-0.01**	**0.05**
20	1.86	-0.05	2.57	-0.08	2.50	-0.21	2.70	-0.10	2.66	-0.06	2.82	-0.05	**-0.09**	**0.12**
22	2.08	0.17	3.00	0.34	3.02	0.30	3.20	0.40	3.09	0.37	3.32	0.45	**0.34**	**0.38**
23	2.07	0.17	2.67	0.02	2.85	0.14	2.88	0.08	2.77	0.06	2.93	0.06	**0.09**	**0.11**
24	2.00	0.09	2.67	0.01	2.73	0.01	2.80	-0.00	2.72	0.00	2.93	0.06	**0.03**	**0.05**
25	1.86	-0.04	2.58	-0.08	2.61	-0.11	2.74	-0.06	2.61	-0.10	2.76	-0.11	**-0.08**	**0.10**
26	2.01	0.11	2.61	-0.04	2.81	0.10	2.76	-0.04	2.64	-0.08	2.73	-0.13	**-0.02**	**0.10**
27	1.85	-0.05	2.60	-0.05	2.66	-0.05	2.80	-0.00	2.65	-0.06	2.90	0.03	**-0.03**	**0.05**
28	1.95	0.04	2.68	0.03	2.77	0.06	2.85	0.05	2.76	0.04	2.92	0.05	**0.04**	**0.05**
29	1.75	-0.16	2.57	-0.09	2.76	0.05	2.86	0.06	2.82	0.10	2.60	-0.27	**-0.05**	**0.16**
30	1.89	-0.01	2.83	0.18	2.98	0.26	3.42	0.62	3.08	0.36	3.43	0.56	**0.33**	**0.43**
31	2.07	0.17	2.72	0.07	2.67	-0.05	2.86	0.06	2.56	-0.16	2.78	-0.09	**-0.00**	**0.12**
32	1.63	-0.27	2.44	-0.21	2.63	-0.09	2.63	-0.17	2.46	-0.25	2.66	-0.21	**-0.20**	**0.23**
33	1.60	-0.31	2.39	-0.26	2.53	-0.18	2.61	-0.19	2.53	-0.19	2.69	-0.18	**-0.22**	**0.25**
34	1.94	0.04	2.80	0.15	2.80	0.09	2.99	0.19	2.88	0.17	2.99	0.12	**0.13**	**0.15**
35	1.99	0.08	2.70	0.05	2.84	0.13	2.73	-0.07	2.65	-0.06	2.85	-0.02	**0.02**	**0.08**
36	1.99	0.09	2.82	0.17	2.91	0.19	2.93	0.13	2.83	0.11	3.00	0.13	**0.14**	**0.15**
37	1.73	-0.17	2.48	-0.17	2.61	-0.10	2.74	-0.06	2.65	-0.07	2.89	0.02	**-0.09**	**0.13**
38	2.04	0.14	2.81	0.16	2.84	0.13	2.98	0.18	2.86	0.14	2.97	0.10	**0.14**	**0.16**
40	2.08	0.18	2.70	0.05	2.79	0.08	2.81	0.01	2.81	0.10	2.95	0.08	**0.08**	**0.11**
113	1.72	-0.18	2.59	-0.06	2.46	-0.25	2.68	-0.12	2.57	-0.15	2.79	-0.08	**-0.14**	**0.17**
137	1.72	-0.18	2.47	-0.19	2.57	-0.14	2.76	-0.04	2.64	-0.07	2.89	0.02	**-0.10**	**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*

VDLUFA

9.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	141	145	136	
p_1	35	35	35	34	35	33	
m	1.90	2.65	2.71	2.80	2.72	2.87	
s_r	0.10	0.08	0.08	0.07	0.09	0.12	
CV_r	5.27	2.88	2.78	2.66	3.23	4.02	
r	0.28	0.22	0.21	0.21	0.25	0.33	
s_R	0.17	0.16	0.16	0.16	0.16	0.16	0.30
CV_R	8.89	5.86	5.78	5.64	6.06	5.72	
R	0.48	0.44	0.44	0.45	0.47	0.46	0.85
HORRAT[1]	2.45	1.70	1.68	1.65	1.76	1.68	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

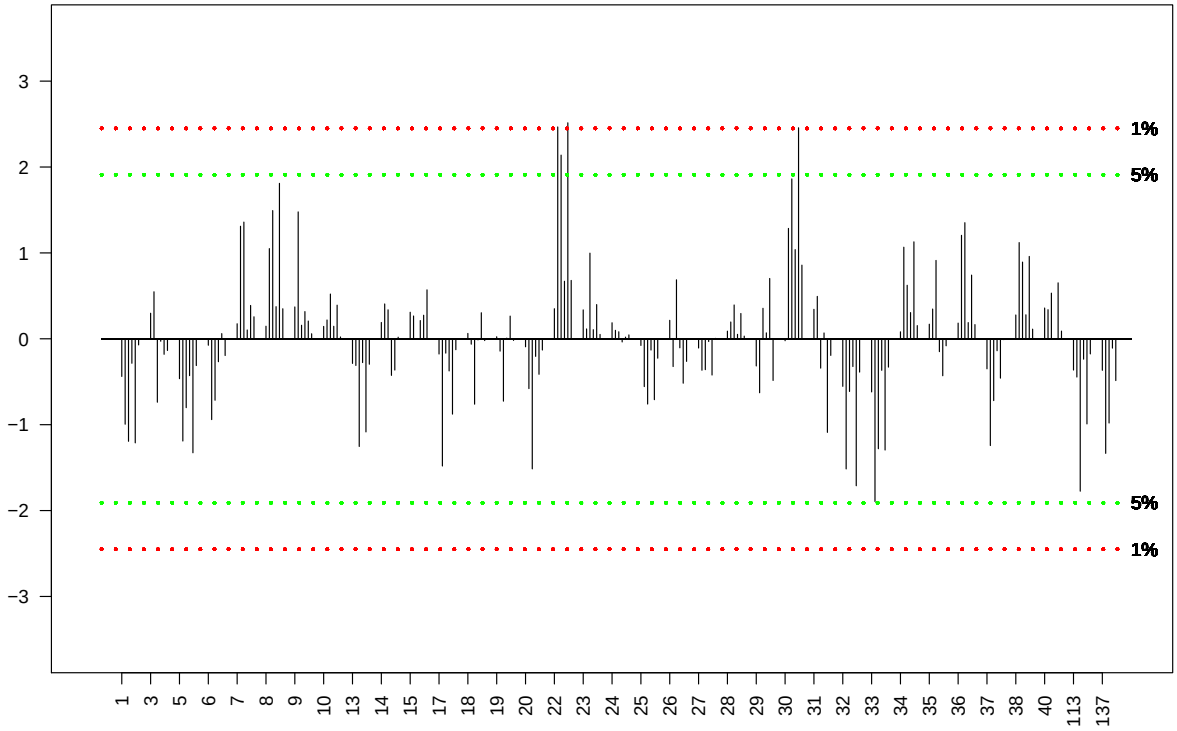
In the following table each lab is marked which was flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	2001	2002	2003	2004	2005	2006
1						
3						
5						
6						
7				C		
8						
9						
10						
13						
14						
15						C
17						
18						
19						
20						
22						B
23						
24						
25						
26						
27						
28						
29						
30				B		B
31	C					C
32	c					
33						
34						
35						
36						
37						
38						
40				C		
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

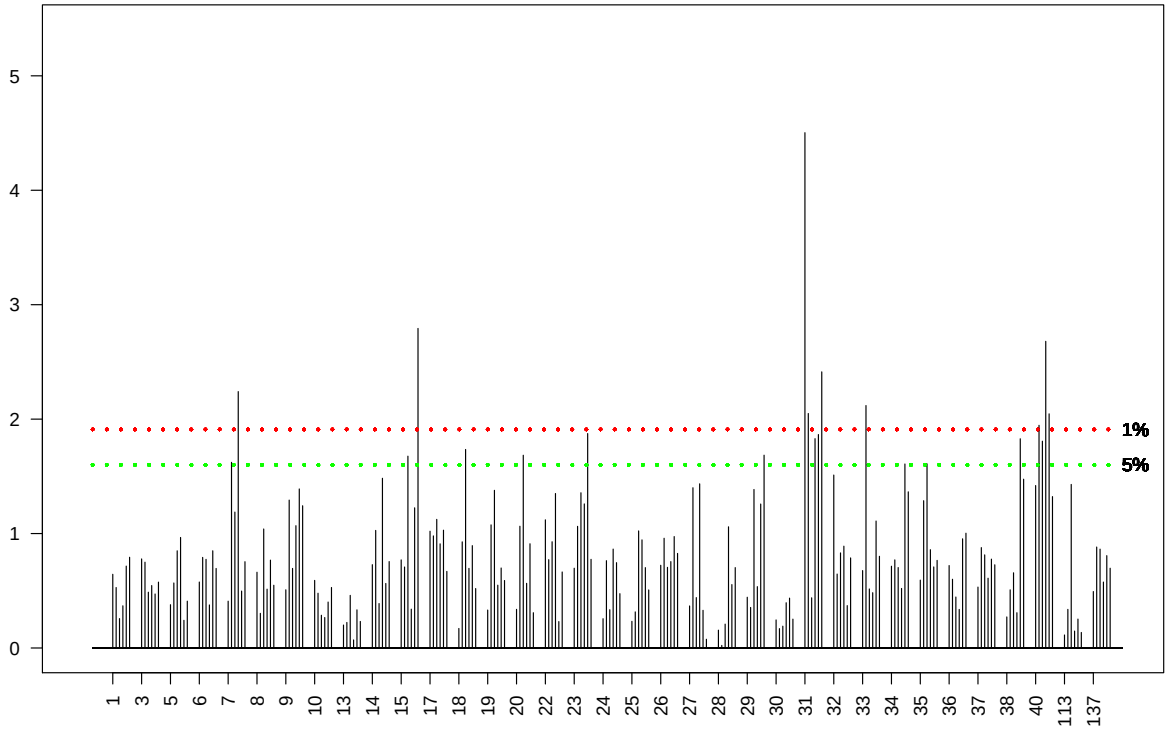
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA

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.

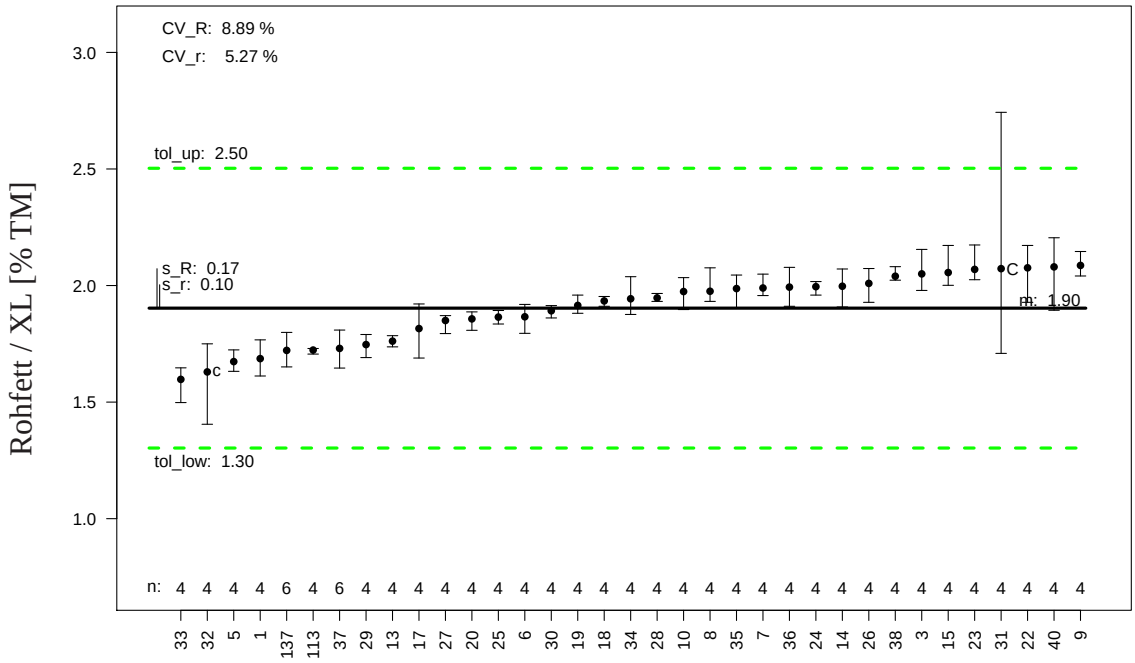
VDLUFA

9.4 Einzelproben / Single Samples

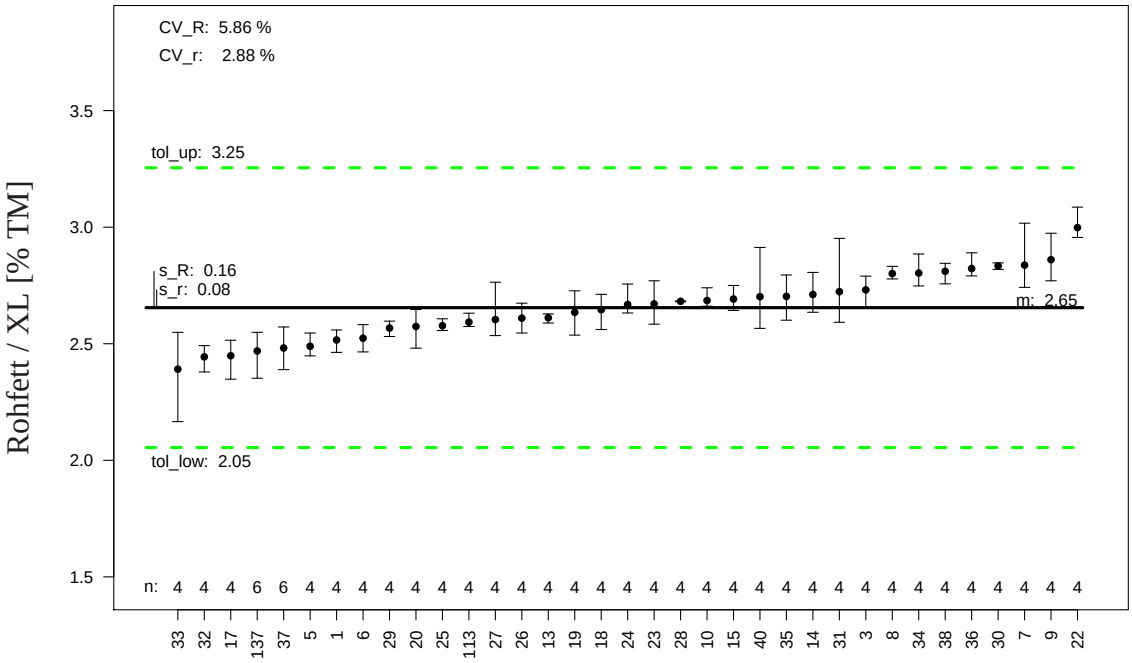
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden -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

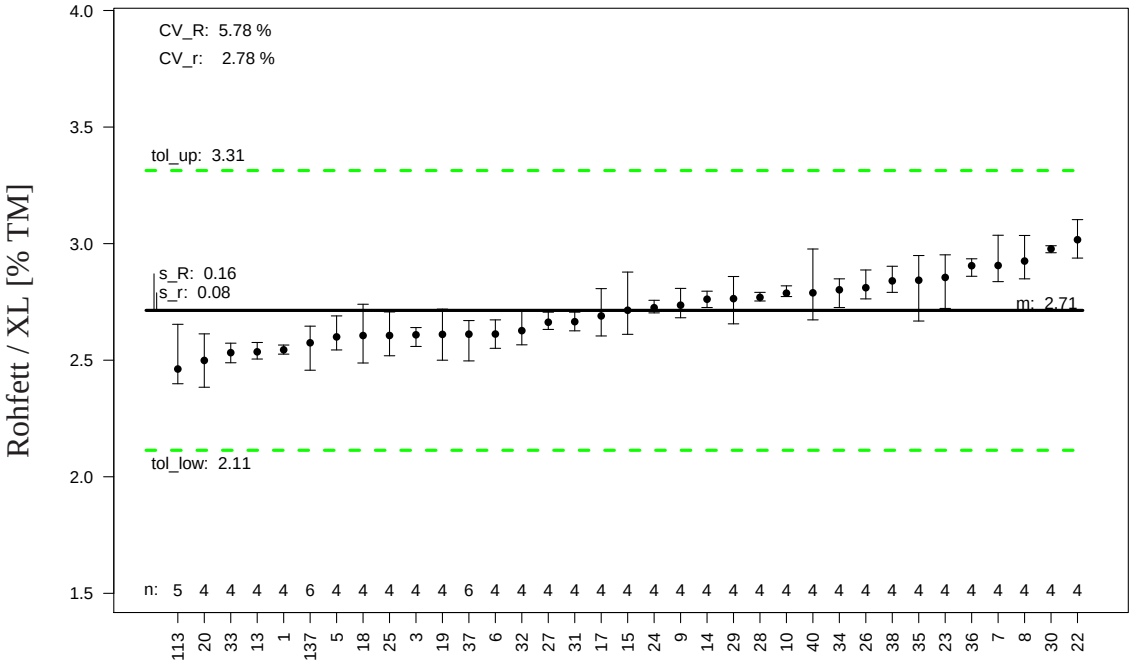
Probe/Sample 2001:



Probe/Sample 2002:

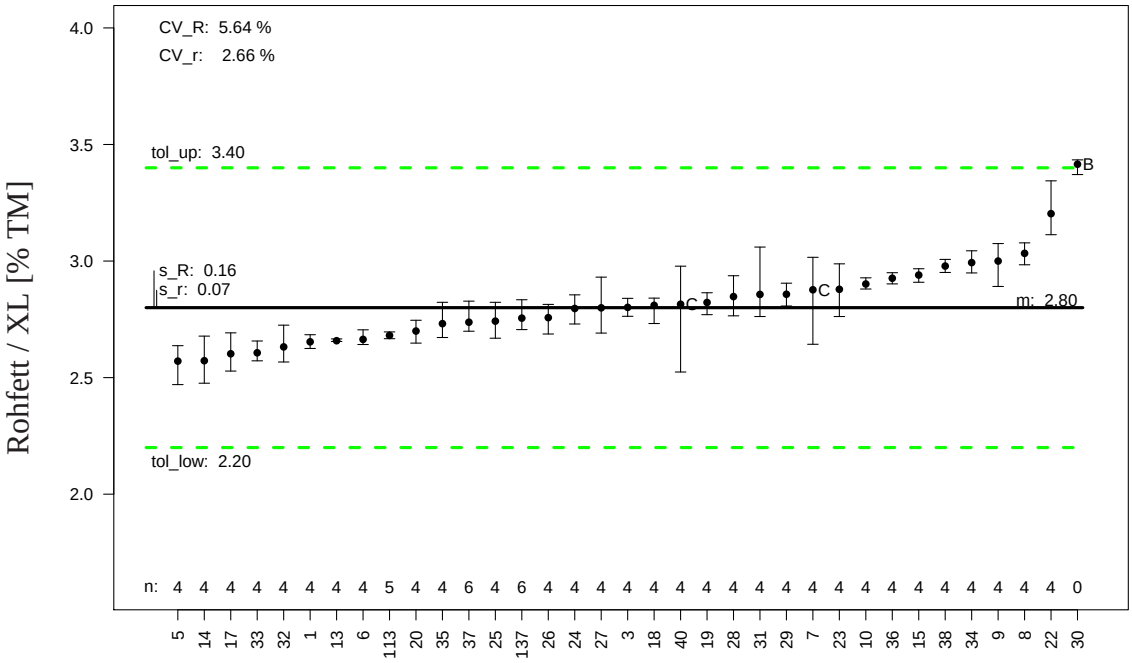


Probe/Sample 2003:

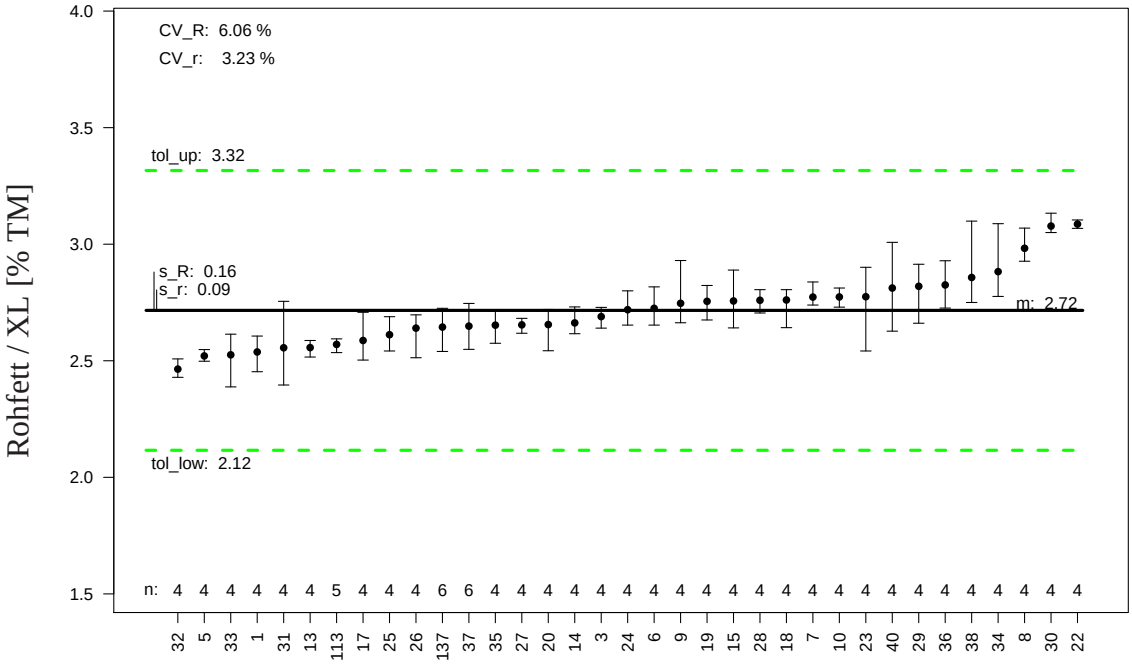


VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Probe/Sample 2004:

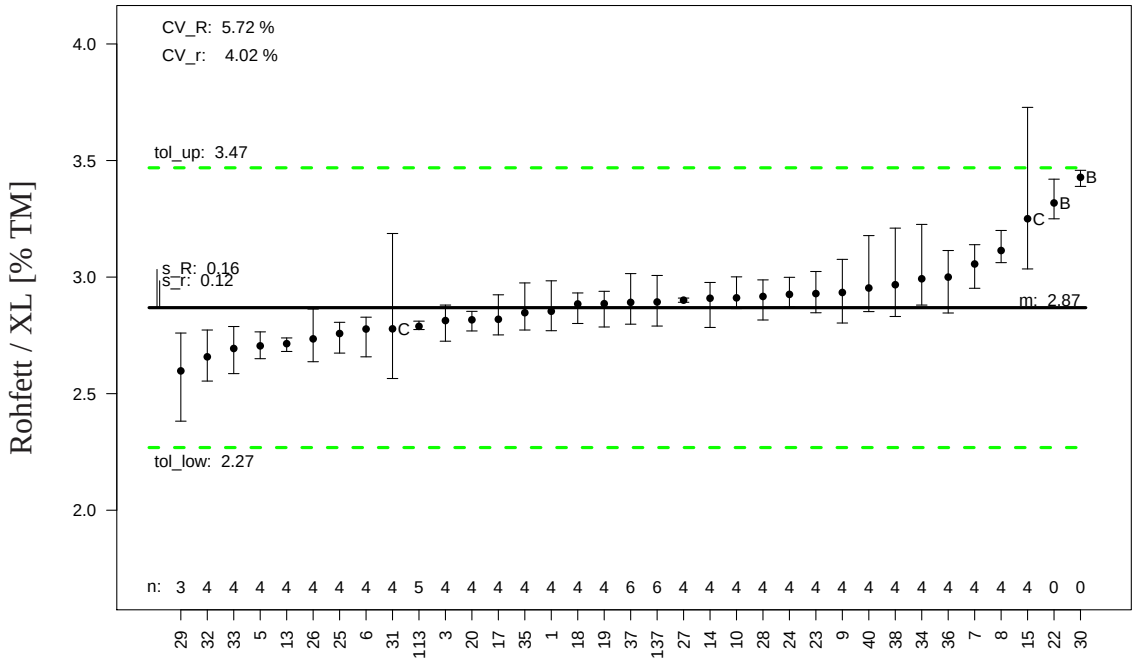


Probe/Sample 2005:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Probe/Sample 2006:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

10 Merkmal / Constituent: Stärke / XS

Einheit / Unit: % TM

10.1 Anmerkungen / Annotations

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.

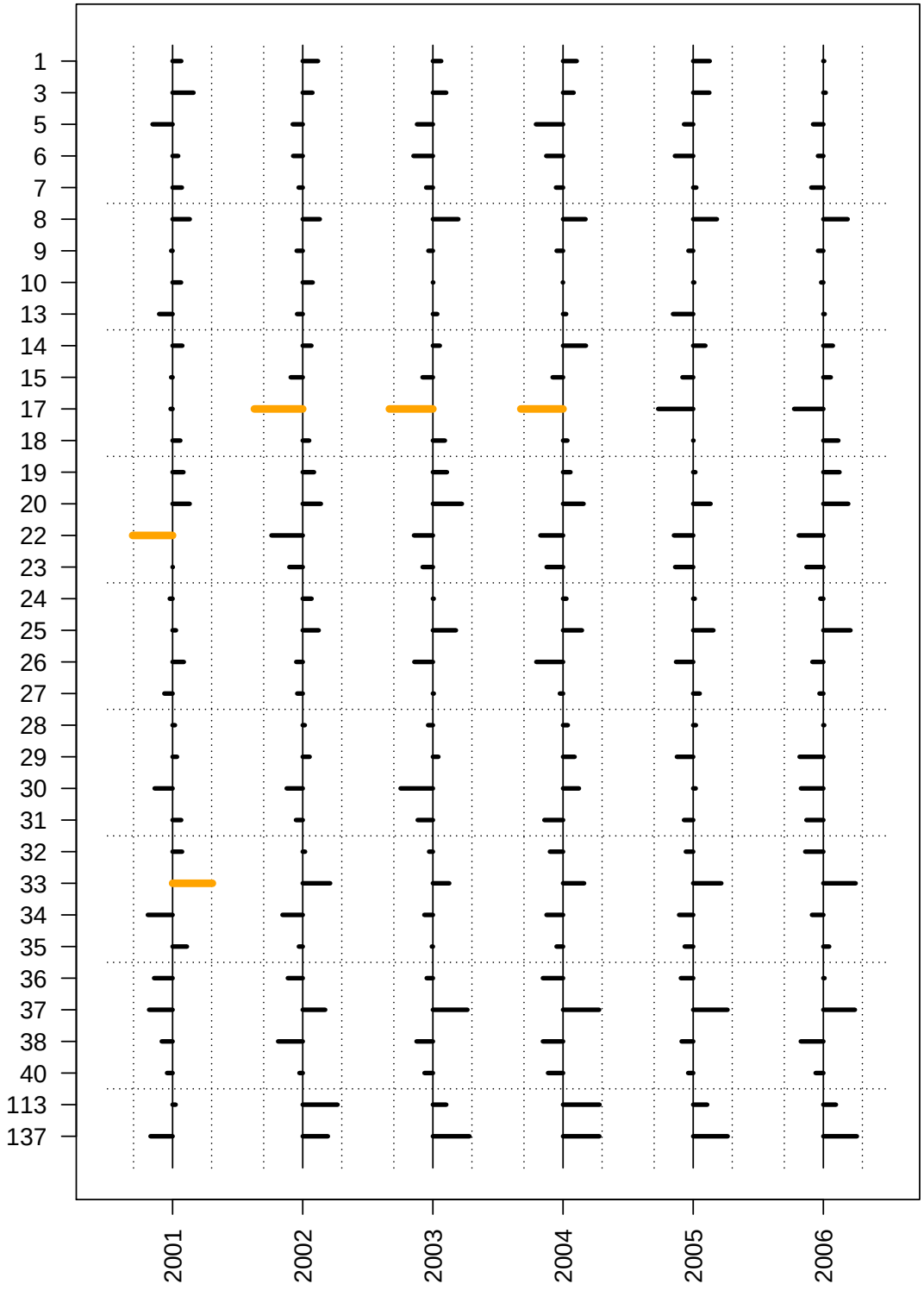
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 2 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Stärke / XS

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

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Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	8.54	0.89	33.21	1.56	38.31	0.85	38.18	1.40	39.25	1.69	36.18	0.08	**1.08**	**1.33**
3	9.80	2.14	32.63	0.99	38.82	1.36	37.86	1.08	39.21	1.65	36.34	0.24	**1.25**	**1.51**
5	5.61	-2.05	30.62	-1.02	35.83	-1.63	34.01	-2.77	36.62	-0.94	35.05	-1.05	**-1.58**	**1.87**
6	8.23	0.57	30.66	-0.98	35.47	-1.99	35.06	-1.72	35.69	-1.87	35.55	-0.55	**-1.09**	**1.55**
7	8.60	0.95	31.22	-0.42	36.77	-0.69	36.05	-0.72	37.88	0.32	34.87	-1.23	**-0.30**	**0.86**
8	9.41	1.76	33.39	1.75	40.07	2.61	39.08	2.30	39.98	2.43	38.59	2.49	**2.22**	**2.46**
9	7.51	-0.14	31.02	-0.62	37.00	-0.46	36.12	-0.66	37.07	-0.49	35.55	-0.55	**-0.49**	**0.56**
10	8.52	0.87	32.66	1.02	37.49	0.03	36.75	-0.03	37.67	0.11	35.88	-0.22	**0.30**	**0.61**
13	6.28	-1.38	31.06	-0.58	37.91	0.45	37.10	0.32	35.49	-2.07	36.24	0.14	**-0.52**	**1.17**
14	8.65	1.00	32.53	0.89	38.17	0.71	39.12	2.34	38.80	1.25	37.07	0.97	**1.19**	**1.43**
15	7.51	-0.15	30.41	-1.23	36.40	-1.06	35.71	-1.07	36.46	-1.10	36.86	0.76	**-0.64**	**1.06**
17	7.45	-0.21	26.68	-4.96	33.00	-4.46	32.45	-4.33	33.98	-3.58	33.11	-2.99	**-3.42**	**4.12**
18	8.45	0.79	32.30	0.66	38.69	1.23	37.23	0.45	37.59	0.03	37.63	1.53	**0.78**	**1.01**
19	8.76	1.11	32.79	1.15	38.90	1.44	37.54	0.76	37.78	0.22	37.75	1.65	**1.06**	**1.26**
20	9.41	1.75	33.50	1.86	40.43	2.97	38.88	2.10	39.34	1.78	38.65	2.55	**2.17**	**2.42**
22	3.56	-4.09	28.44	-3.20	35.52	-1.94	34.46	-2.32	35.58	-1.97	33.58	-2.52	**-2.67**	**3.05**
23	7.68	0.02	30.27	-1.37	36.41	-1.05	35.10	-1.68	35.71	-1.85	34.37	-1.73	**-1.28**	**1.56**
24	7.37	-0.29	32.55	0.91	37.54	0.08	37.12	0.35	37.72	0.16	35.79	-0.31	**0.15**	**0.48**
25	8.00	0.35	33.27	1.63	39.82	2.36	38.71	1.93	39.63	2.07	38.88	2.78	**1.85**	**2.19**
26	8.81	1.15	30.98	-0.66	35.56	-1.90	34.04	-2.73	35.80	-1.76	34.98	-1.12	**-1.17**	**1.85**
27	6.81	-0.84	31.08	-0.56	37.55	0.09	36.45	-0.32	38.22	0.67	35.70	-0.40	**-0.23**	**0.59**
28	7.89	0.24	31.85	0.21	36.97	-0.49	37.26	0.49	37.83	0.27	36.19	0.09	**0.13**	**0.36**
29	8.11	0.45	32.35	0.71	38.02	0.56	37.96	1.18	35.89	-1.67	33.67	-2.43	**-0.20**	**1.49**
30	5.82	-1.84	30.00	-1.64	34.15	-3.31	38.41	1.63	37.82	0.26	33.80	-2.30	**-1.20**	**2.24**
31	8.54	0.88	30.95	-0.69	35.91	-1.55	34.86	-1.91	36.62	-0.94	34.37	-1.74	**-0.99**	**1.50**
32	8.63	0.97	31.88	0.23	37.07	-0.39	35.43	-1.34	36.80	-0.75	34.25	-1.85	**-0.52**	**1.18**
33	11.74	4.08	34.45	2.81	39.13	1.67	38.93	2.16	40.44	2.88	39.41	3.31	**2.82**	**3.20**
34	5.12	-2.53	29.57	-2.07	36.58	-0.88	35.09	-1.69	36.12	-1.44	34.94	-1.16	**-1.63**	**1.88**
35	9.12	1.47	31.24	-0.40	37.35	-0.11	36.11	-0.66	36.69	-0.87	36.70	0.60	**0.00**	**0.88**
36	5.76	-1.89	30.11	-1.53	36.82	-0.63	34.71	-2.07	36.29	-1.26	36.22	0.12	**-1.21**	**1.56**
37	5.25	-2.40	33.94	2.30	40.99	3.54	40.47	3.69	41.07	3.51	39.33	3.23	**2.31**	**3.46**
38	6.55	-1.11	29.12	-2.52	35.79	-1.67	34.71	-2.07	36.37	-1.19	33.79	-2.31	**-1.81**	**2.07**
40	7.09	-0.56	31.30	-0.34	36.60	-0.86	35.24	-1.53	37.04	-0.51	35.31	-0.79	**-0.77**	**0.94**
113	7.97	0.31	35.20	3.56	38.83	1.37	40.51	3.74	38.99	1.43	37.39	1.29	**1.95**	**2.54**
137	5.39	-2.26	34.21	2.57	41.20	3.74	40.49	3.72	41.09	3.53	39.53	3.43	**2.46**	**3.57**

[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*

VDLUFA

10.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	145	145	144	
p_1	35	35	35	35	35	35	
m	7.66	31.64	37.46	36.78	37.56	36.10	
s_r	0.60	0.62	0.78	0.58	0.67	0.78	
CV_r	7.85	1.95	2.08	1.59	1.79	2.16	
r	1.70	1.75	2.20	1.65	1.90	2.21	
s_R	1.72	1.89	2.03	2.18	1.88	1.98	2.00
CV_R	22.45	5.96	5.41	5.92	5.02	5.47	
R	4.86	5.34	5.74	6.16	5.33	5.59	5.66
HORRAT[1]	7.63	2.51	2.33	2.55	2.17	2.35	

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

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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 flaged as an outlier for a sample.

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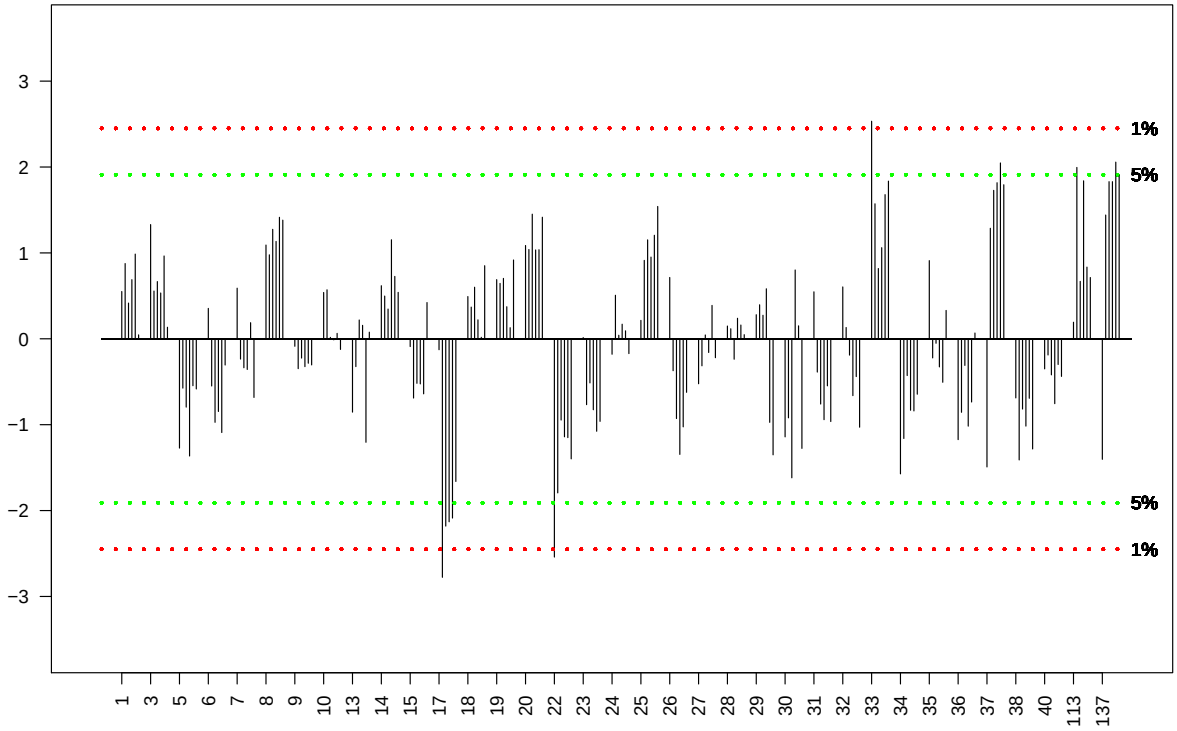
Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1					c	
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23						
24						
25						
26			C			
27						
28						
29						
30						
31						
32						
33						
34						
35		c				
36						
37						
38						
40						
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

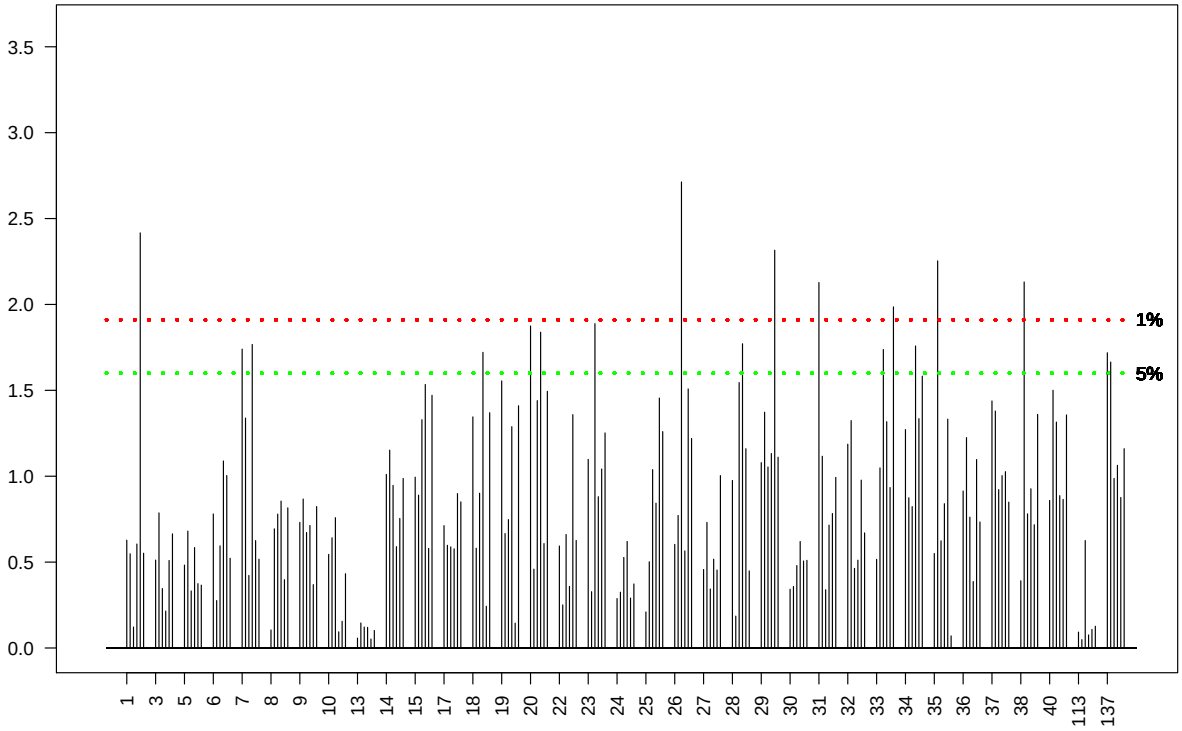
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA

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.

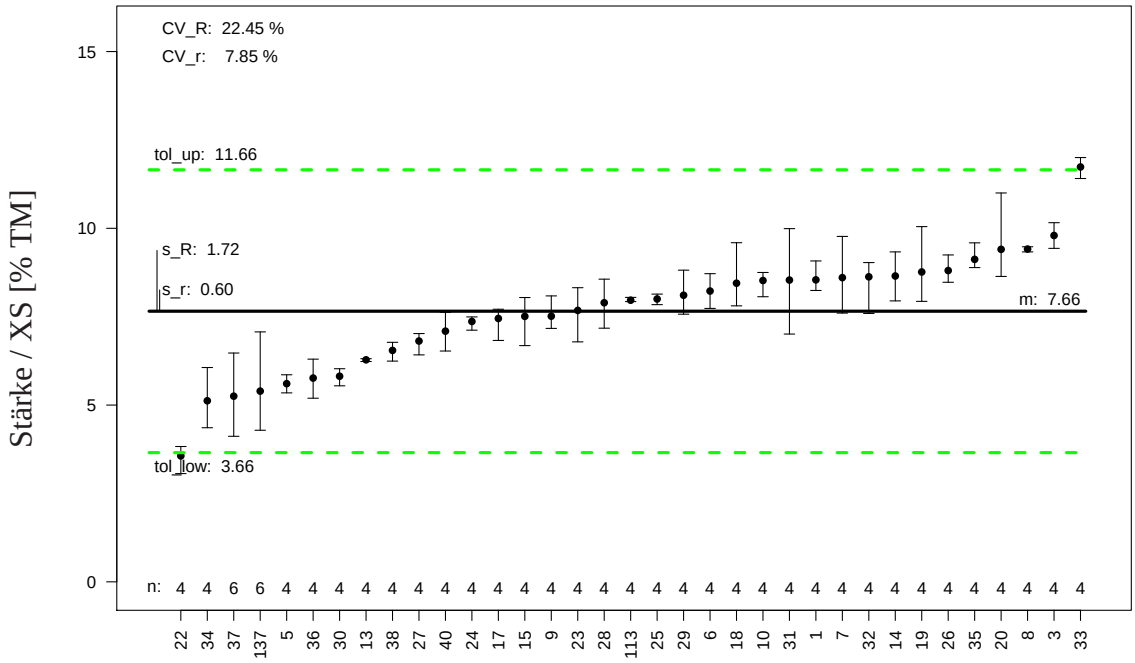
VDLUFA

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.

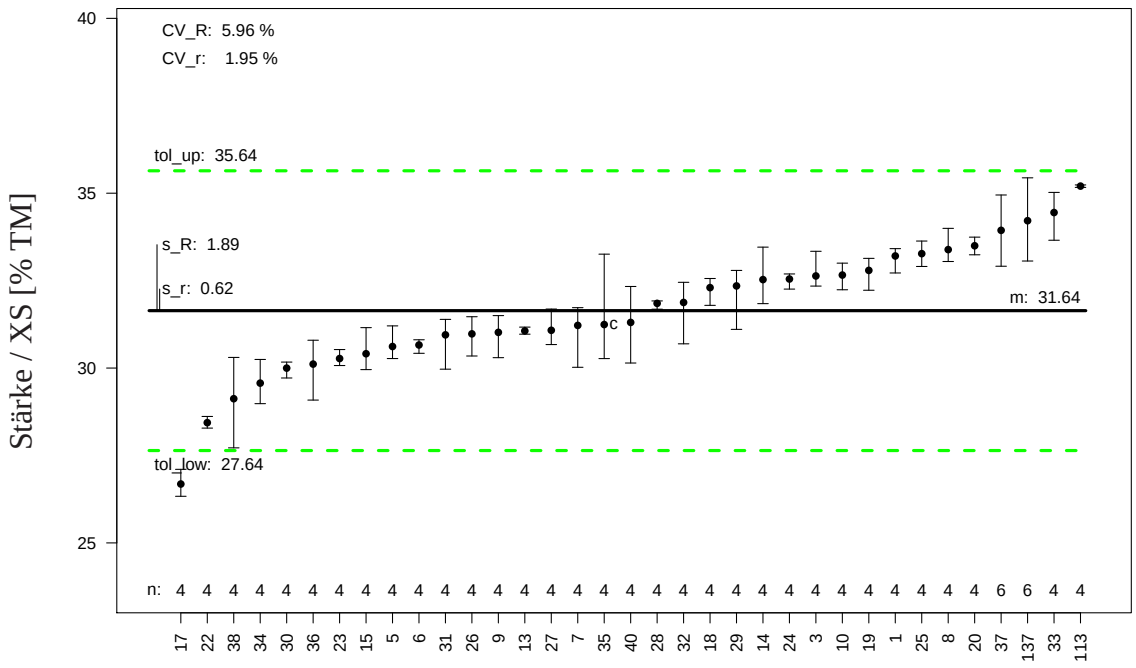
The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency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

Probe/Sample 2001:

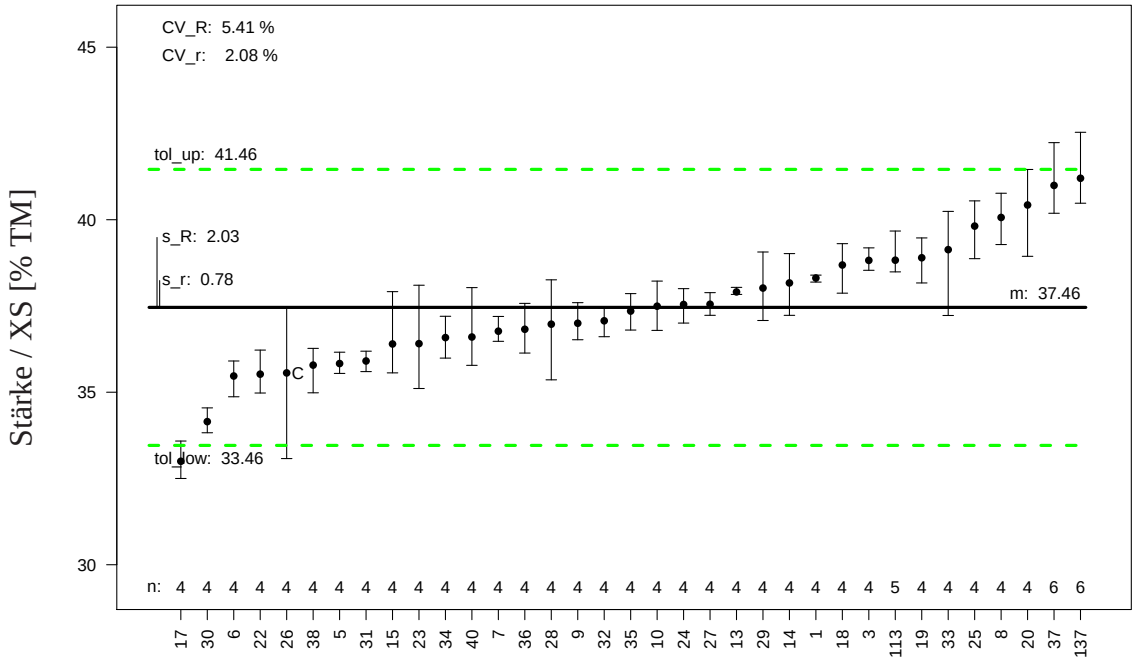


VDLUFA

Probe/Sample 2002:

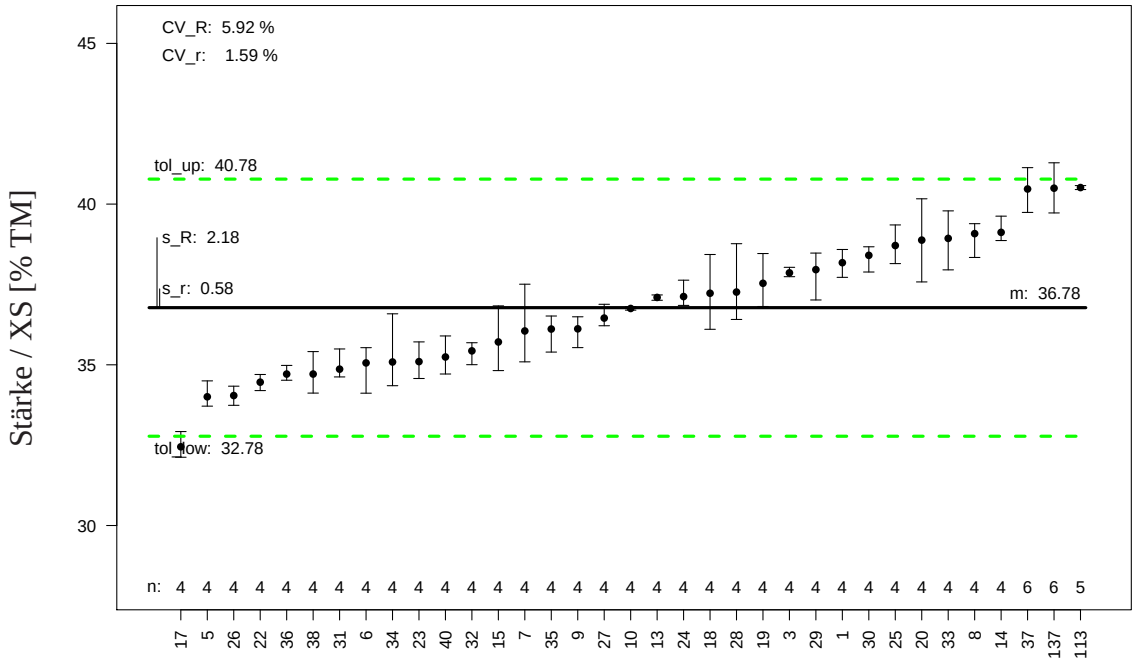


Probe/Sample 2003:

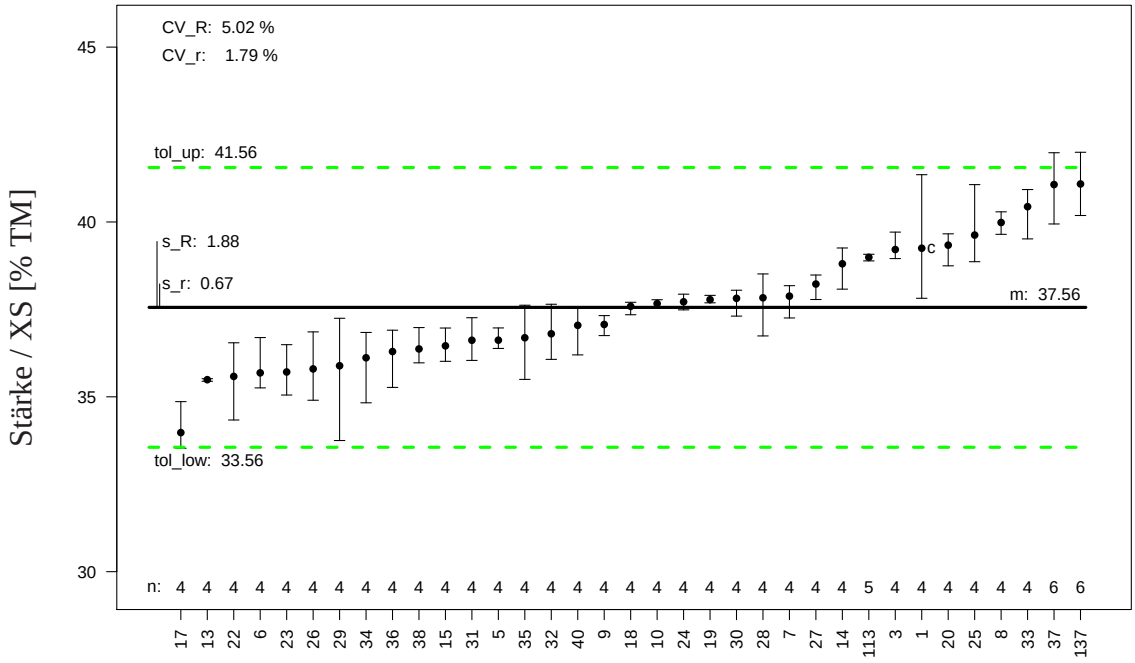


VDLUFA

Probe/Sample 2004:



Probe/Sample 2005:



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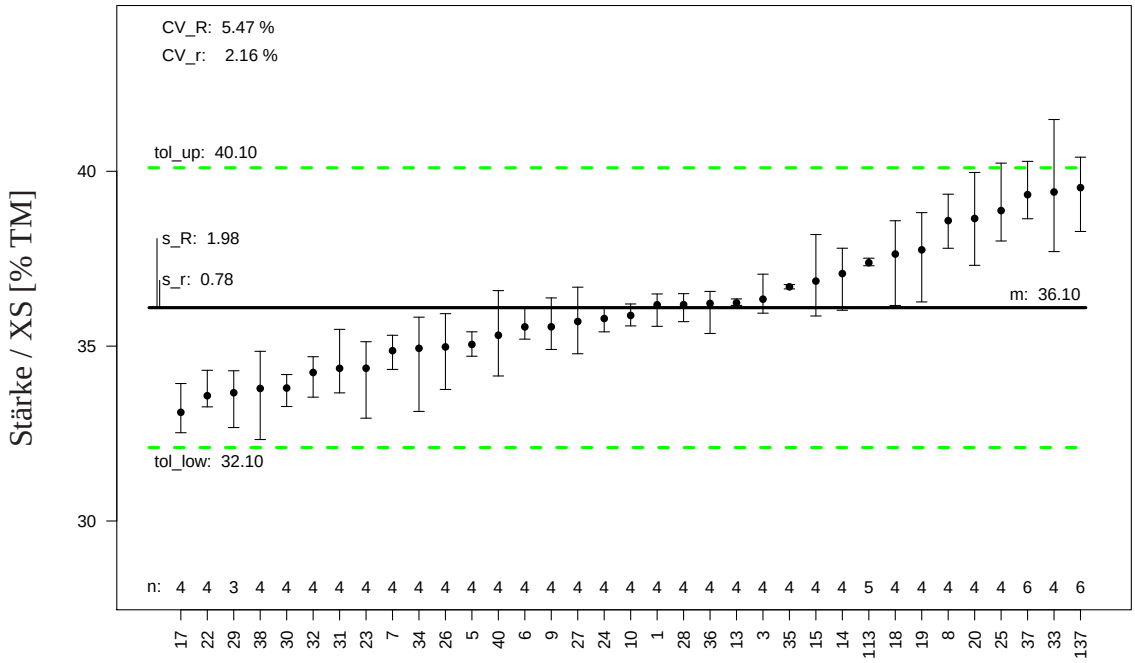
Probe/Sample 2006:



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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.

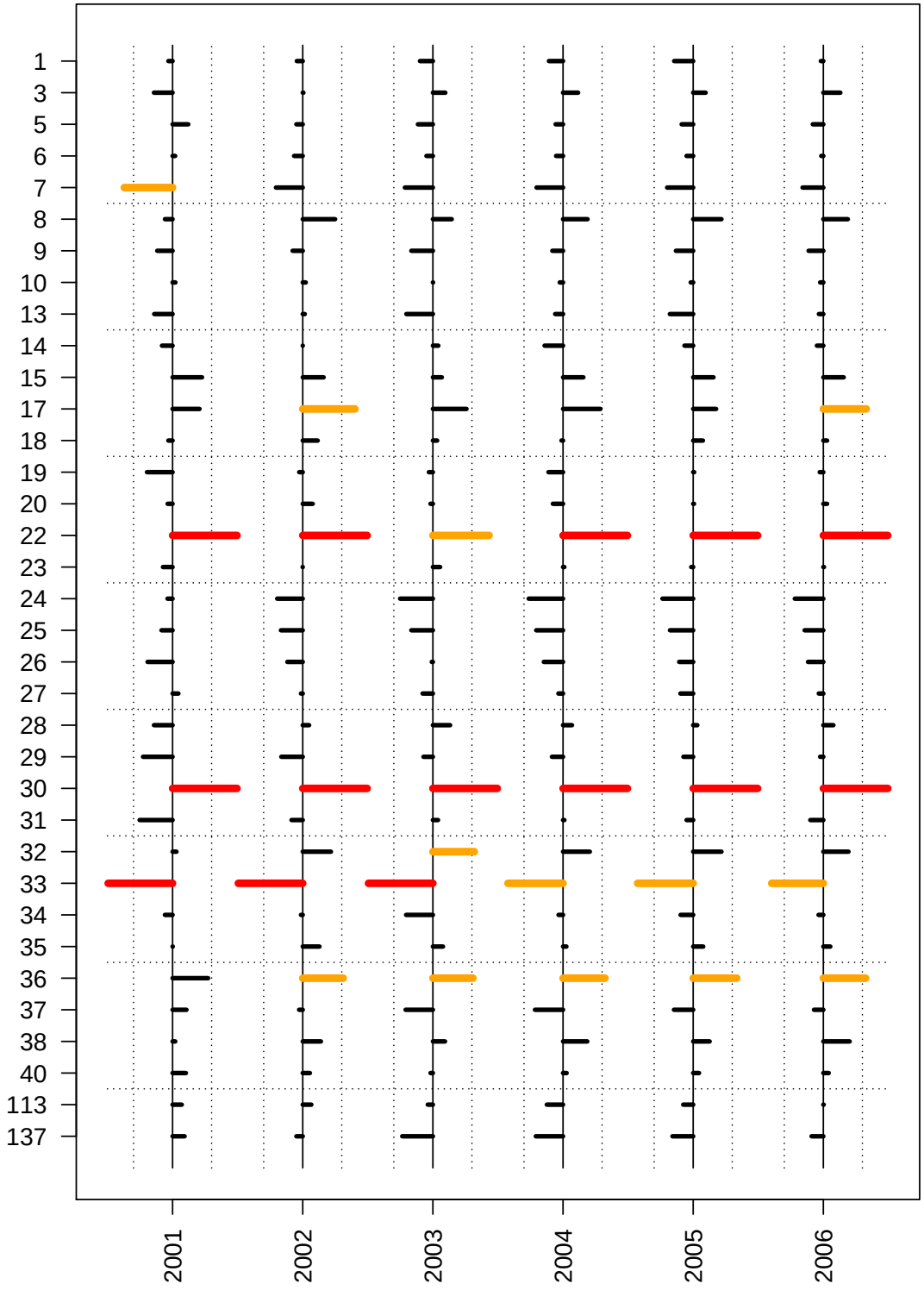
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 0.5 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Zucker / XZ

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	11.62	-0.11	8.28	-0.15	5.38	-0.33	6.31	-0.36	6.46	-0.49	7.04	-0.06	**-0.25**	**0.32**
3	11.25	-0.48	8.45	0.02	6.03	0.32	7.05	0.39	7.27	0.32	7.54	0.44	**0.17**	**0.39**
5	12.13	0.40	8.27	-0.16	5.32	-0.38	6.48	-0.19	6.66	-0.30	6.84	-0.27	**-0.15**	**0.33**
6	11.80	0.07	8.21	-0.22	5.54	-0.16	6.49	-0.18	6.78	-0.17	7.06	-0.05	**-0.12**	**0.17**
7	10.50	-1.24	7.74	-0.69	4.99	-0.72	5.99	-0.68	6.28	-0.67	6.58	-0.53	**-0.75**	**0.86**
8	11.54	-0.20	9.26	0.83	6.19	0.48	7.30	0.63	7.68	0.72	7.74	0.63	**0.52**	**0.67**
9	11.34	-0.39	8.17	-0.26	5.16	-0.55	6.39	-0.27	6.51	-0.44	6.73	-0.38	**-0.38**	**0.43**
10	11.80	0.07	8.51	0.08	5.71	0.00	6.58	-0.09	6.89	-0.06	7.03	-0.08	**-0.01**	**0.08**
13	11.26	-0.47	8.48	0.05	5.03	-0.68	6.47	-0.20	6.35	-0.60	6.99	-0.11	**-0.34**	**0.47**
14	11.46	-0.27	8.43	0.00	5.85	0.14	6.20	-0.47	6.73	-0.22	6.94	-0.16	**-0.17**	**0.28**
15	12.49	0.75	8.96	0.53	5.94	0.23	7.19	0.52	7.47	0.52	7.63	0.52	**0.51**	**0.59**
17	12.42	0.69	9.77	1.34	6.57	0.86	7.63	0.96	7.54	0.59	8.21	1.10	**0.92**	**1.05**
18	11.62	-0.11	8.81	0.38	5.82	0.11	6.63	-0.04	7.20	0.25	7.20	0.10	**0.11**	**0.22**
19	11.08	-0.66	8.34	-0.09	5.61	-0.10	6.30	-0.37	6.98	0.03	7.02	-0.09	**-0.21**	**0.35**
20	11.61	-0.13	8.69	0.26	5.65	-0.06	6.41	-0.26	6.97	0.02	7.20	0.10	**-0.01**	**0.18**
22	13.29	1.56	10.27	1.84	7.15	1.44	8.24	1.57	8.48	1.53	8.87	1.76	**1.62**	**1.78**
23	11.49	-0.25	8.43	-0.00	5.89	0.18	6.70	0.03	6.90	-0.05	7.12	0.02	**-0.01**	**0.14**
24	11.60	-0.13	7.78	-0.65	4.87	-0.84	5.79	-0.88	6.16	-0.79	6.38	-0.73	**-0.67**	**0.78**
25	11.45	-0.28	7.87	-0.56	5.16	-0.55	5.98	-0.69	6.36	-0.60	6.63	-0.48	**-0.53**	**0.59**
26	11.09	-0.64	8.04	-0.39	5.68	-0.03	6.18	-0.49	6.59	-0.36	6.72	-0.39	**-0.38**	**0.47**
27	11.88	0.15	8.38	-0.05	5.44	-0.26	6.55	-0.12	6.62	-0.33	6.99	-0.12	**-0.12**	**0.21**
28	11.25	-0.48	8.59	0.16	6.15	0.44	6.90	0.23	7.06	0.11	7.37	0.26	**0.12**	**0.34**
29	10.97	-0.76	7.88	-0.55	5.47	-0.24	6.38	-0.28	6.70	-0.25	7.03	-0.08	**-0.36**	**0.47**
30	13.34	1.61	10.33	1.90	7.51	1.81	8.69	2.02	8.72	1.76	9.38	2.27	**1.89**	**2.09**
31	10.89	-0.84	8.14	-0.29	5.84	0.13	6.70	0.03	6.78	-0.17	6.77	-0.33	**-0.24**	**0.44**
32	11.83	0.10	9.15	0.72	6.77	1.06	7.35	0.69	7.67	0.72	7.75	0.64	**0.66**	**0.78**
33	7.98	-3.75	6.09	-2.34	4.18	-1.52	5.26	-1.41	5.53	-1.42	5.79	-1.32	**-1.96**	**2.35**
34	11.54	-0.20	8.38	-0.05	5.02	-0.69	6.55	-0.12	6.63	-0.32	6.99	-0.12	**-0.25**	**0.36**
35	11.74	0.01	8.86	0.43	5.97	0.26	6.75	0.09	7.21	0.26	7.29	0.18	**0.20**	**0.27**
36	12.64	0.91	9.47	1.04	6.73	1.03	7.74	1.07	8.07	1.11	8.19	1.08	**1.04**	**1.14**
37	12.09	0.36	8.34	-0.09	5.01	-0.70	5.95	-0.72	6.46	-0.49	6.87	-0.24	**-0.31**	**0.54**
38	11.80	0.07	8.90	0.47	6.02	0.31	7.29	0.62	7.37	0.42	7.78	0.67	**0.43**	**0.52**
40	12.07	0.34	8.61	0.18	5.65	-0.06	6.76	0.09	7.10	0.15	7.25	0.14	**0.14**	**0.20**
113	11.97	0.23	8.65	0.22	5.58	-0.13	6.25	-0.42	6.70	-0.26	7.12	0.01	**-0.06**	**0.27**
137	12.04	0.31	8.27	-0.16	4.92	-0.79	5.97	-0.70	6.42	-0.53	6.81	-0.30	**-0.36**	**0.56**

[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*

VDLUFA

11.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	140	136	145	145	145	136	
p_1	34	33	35	35	35	33	
m	11.73	8.43	5.71	6.67	6.95	7.11	
s_r	0.24	0.19	0.20	0.18	0.18	0.21	
CV_r	2.06	2.24	3.58	2.66	2.56	2.94	
r	0.68	0.54	0.58	0.50	0.50	0.59	
s_R	0.64	0.64	0.70	0.71	0.66	0.52	0.50
CV_R	5.46	7.58	12.32	10.64	9.50	7.32	
R	1.81	1.81	1.99	2.01	1.87	1.47	1.42
HORRAT[1]	1.98	2.61	4.00	3.54	3.18	2.46	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

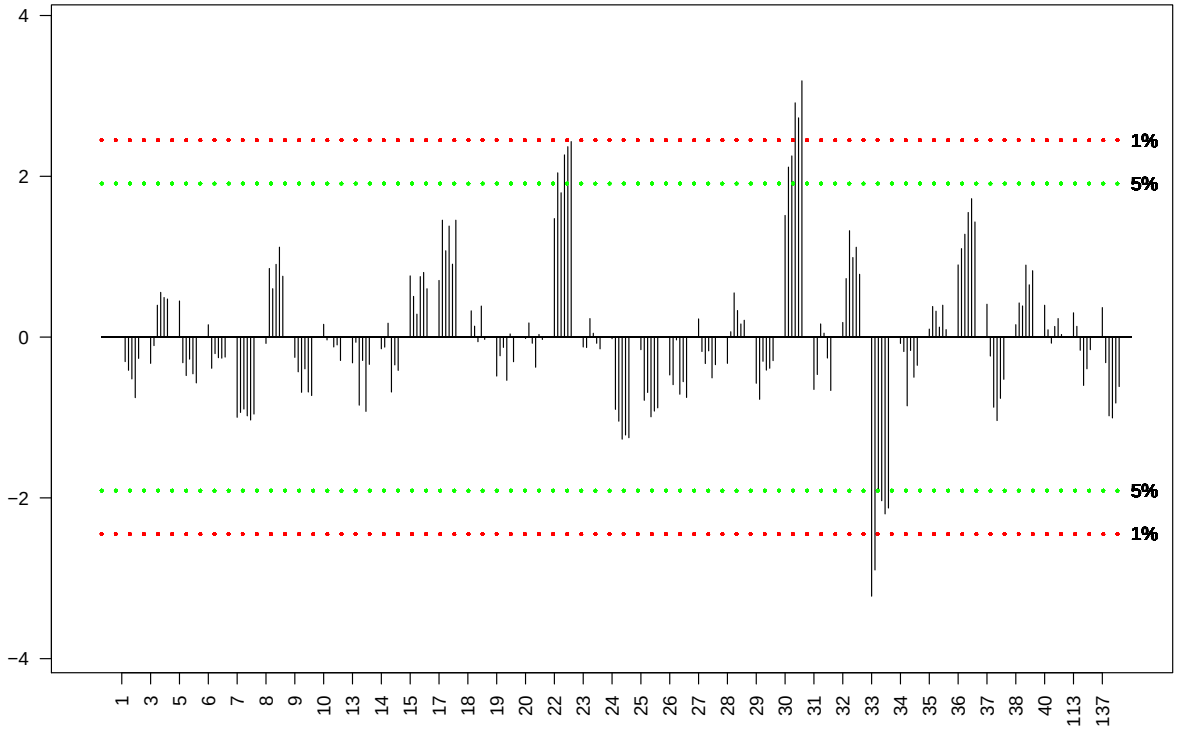
In the following table each lab is marked which was flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22	b	B		b	b	B
23						
24						
25						
26						
27						
28						
29			C			
30	b	B		b	b	B
31	C					
32						
33	B	C				
34						
35						
36						
37						
38						
40						
113						
137						

VDLUFA

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.

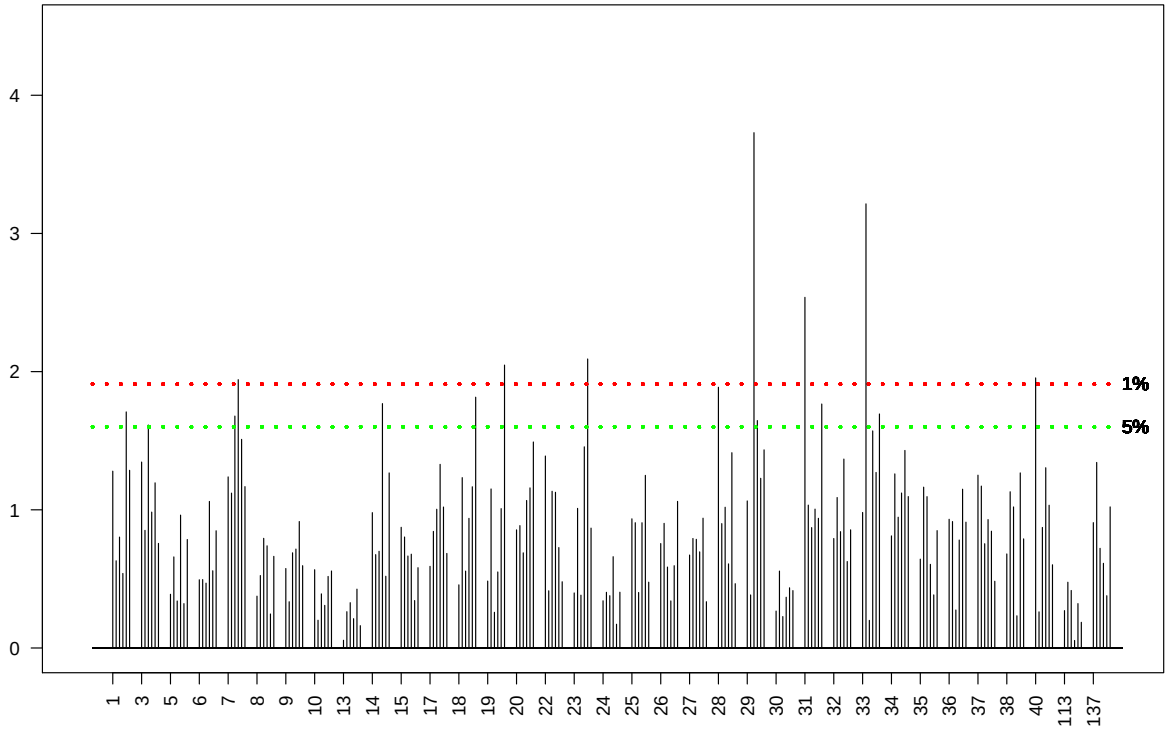
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA

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.

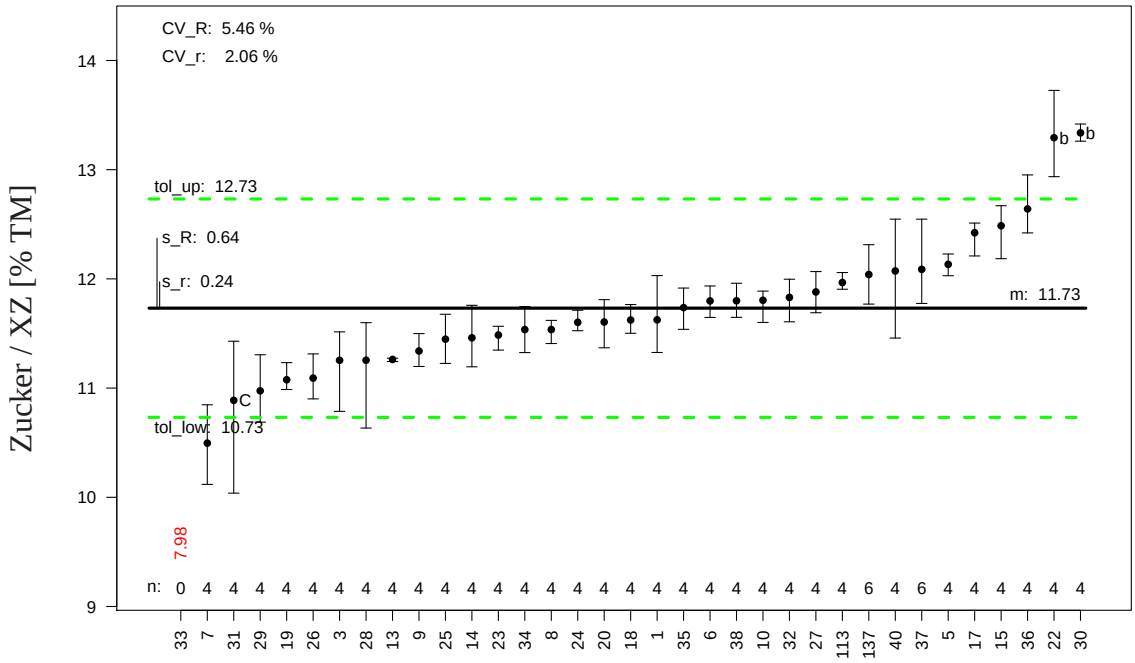
VDLUFA

11.4 Einzelproben / Single Samples

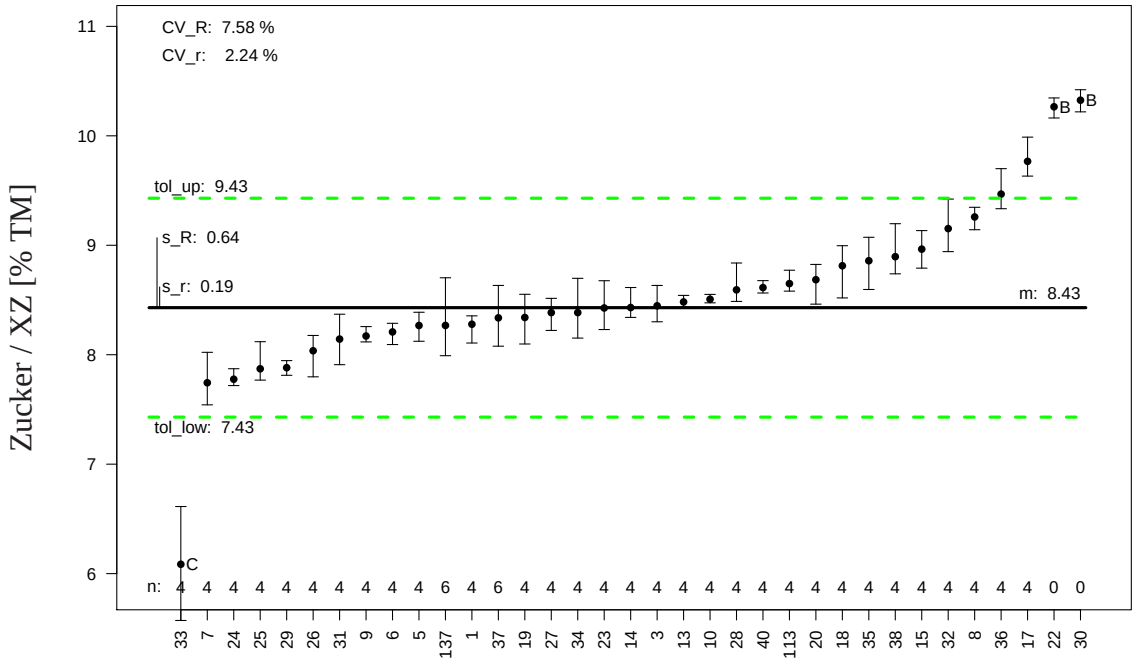
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden -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

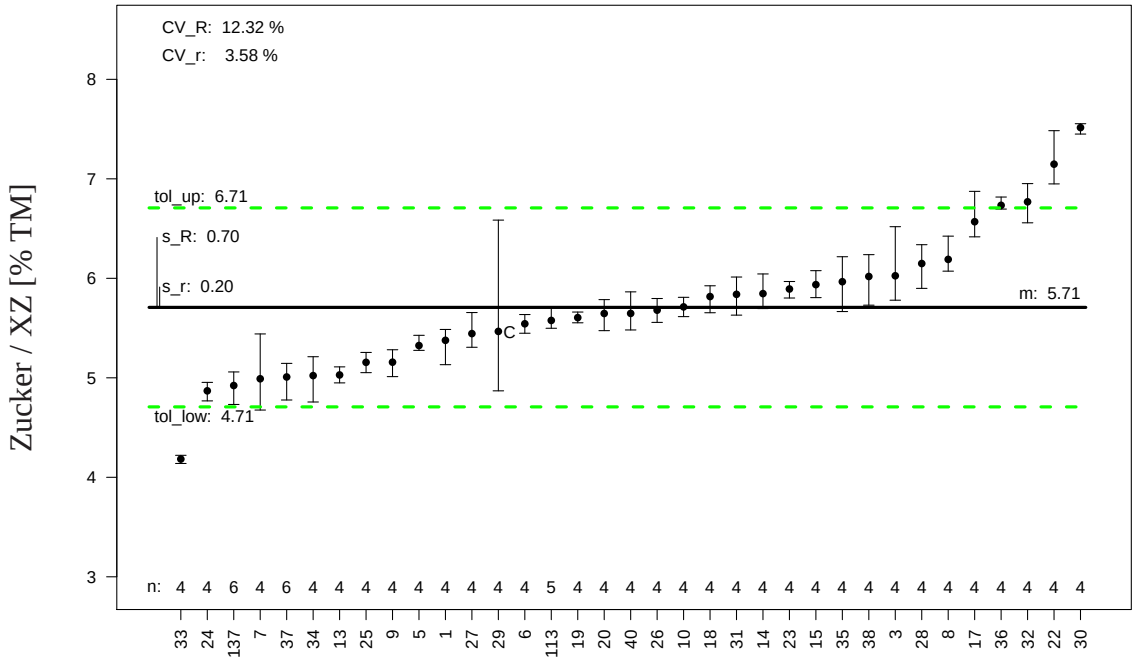
Probe/Sample 2001:



Probe/Sample 2002:

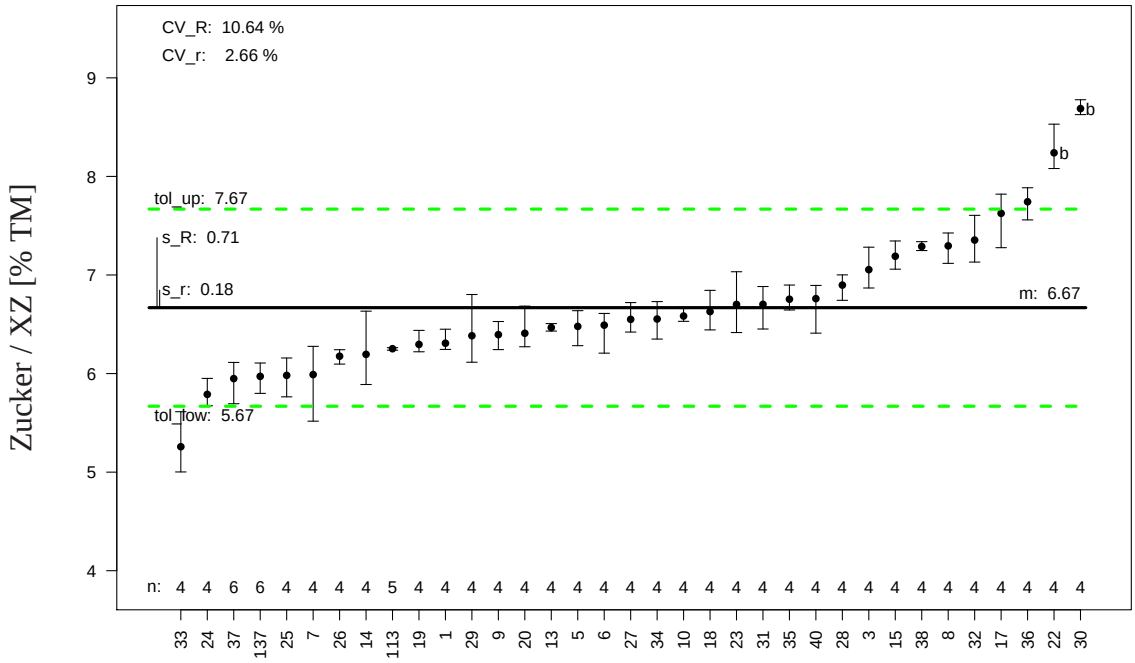


Probe/Sample 2003:

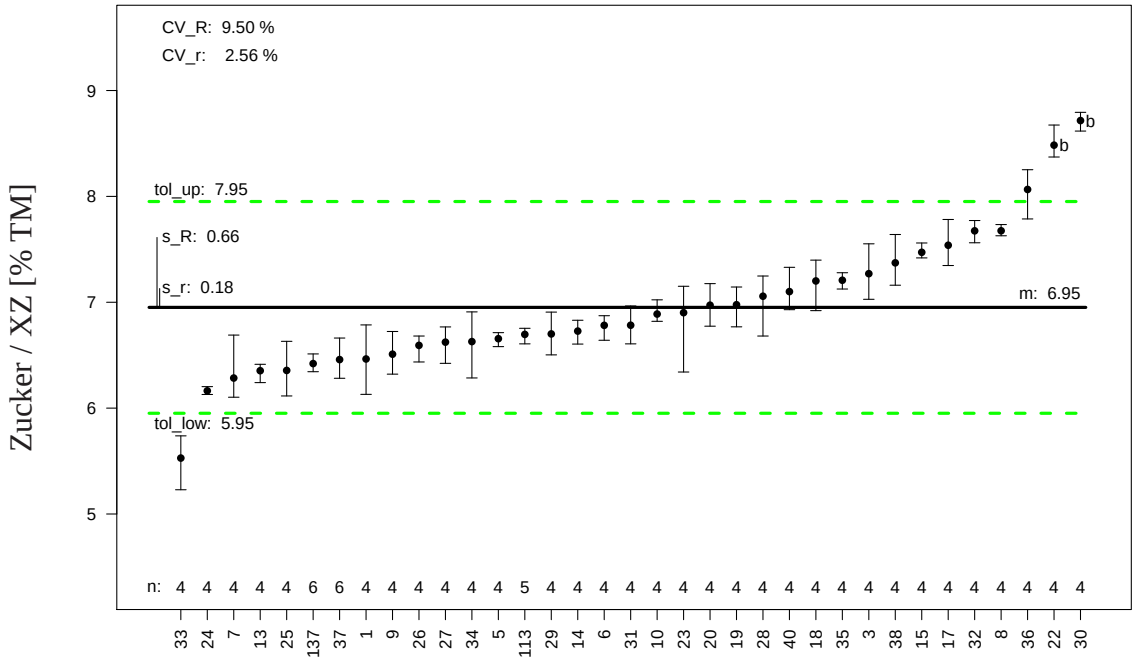


VDLUFA

Probe/Sample 2004:



Probe/Sample 2005:



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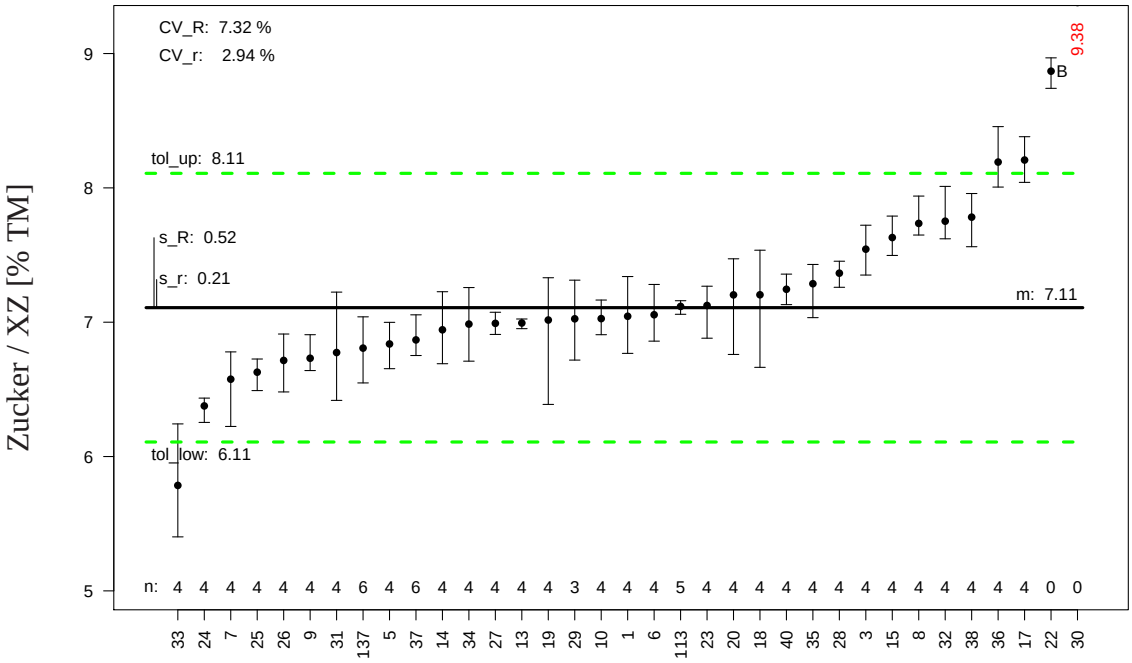
Probe/Sample 2006:



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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.

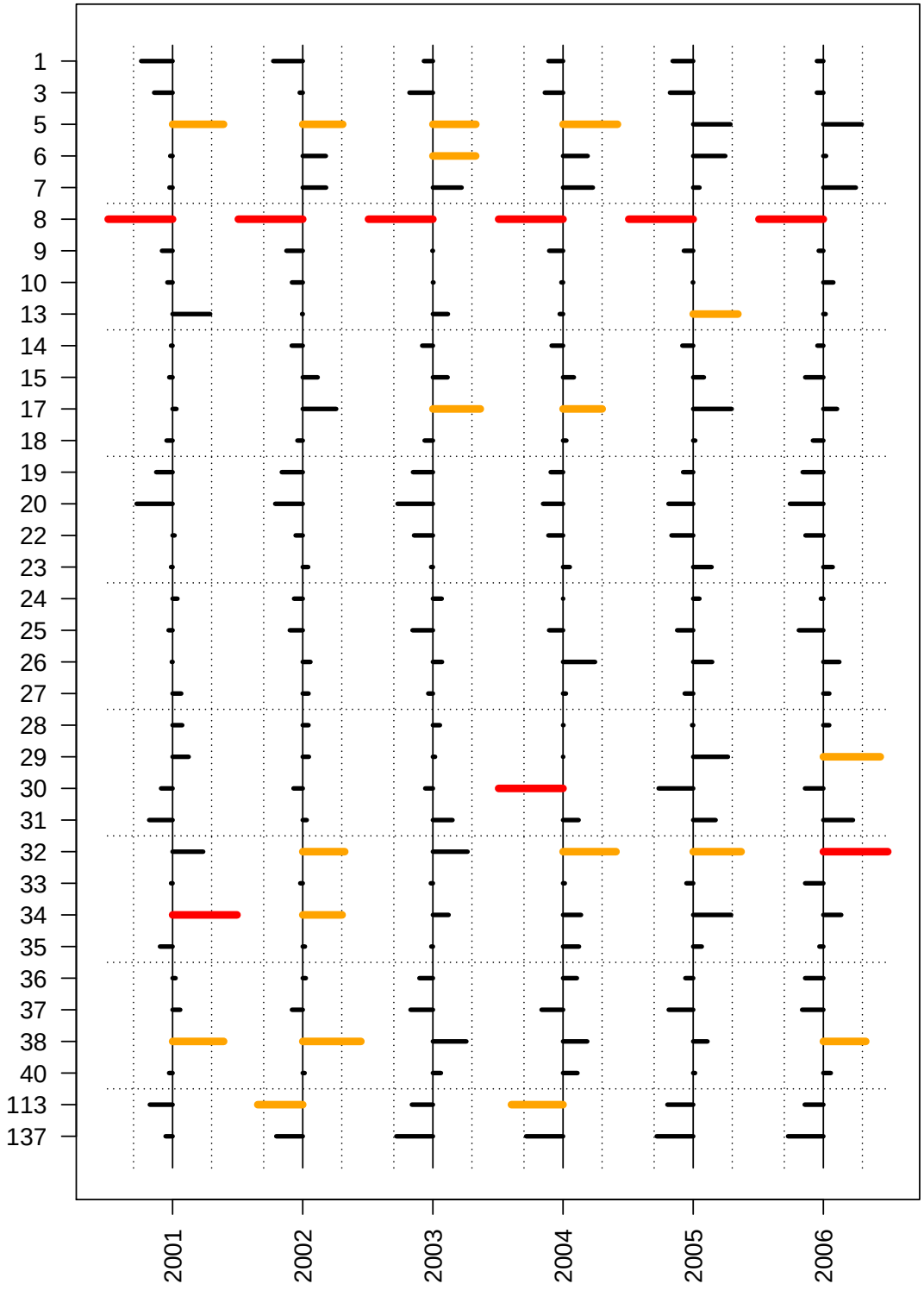
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.75 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

aNDFom

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

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Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	53.03	-2.81	36.11	-2.64	34.74	-0.81	33.66	-1.31	33.08	-1.84	36.09	-0.58	**-1.66**	**2.05**
3	54.20	-1.65	38.48	-0.27	33.45	-2.10	33.34	-1.63	32.84	-2.08	36.08	-0.58	**-1.39**	**1.71**
5	60.42	4.57	42.34	3.58	39.39	3.85	39.85	4.88	38.26	3.34	40.10	3.44	**3.94**	**4.37**
6	55.64	-0.21	40.83	2.07	39.38	3.84	37.17	2.20	37.80	2.88	36.91	0.24	**1.84**	**2.54**
7	55.57	-0.28	40.85	2.09	38.12	2.57	37.64	2.67	35.49	0.57	39.57	2.91	**1.76**	**2.33**
8	50.20	-5.65	32.61	-6.15	28.95	-6.59	28.94	-6.03	27.65	-7.27	29.89	-6.77	**-6.41**	**7.05**
9	54.90	-0.95	37.30	-1.46	35.50	-0.04	33.73	-1.24	34.09	-0.84	36.25	-0.42	**-0.82**	**1.04**
10	55.38	-0.47	37.79	-0.97	35.60	0.05	34.82	-0.15	34.88	-0.04	37.56	0.90	**-0.11**	**0.63**
13	59.22	3.37	38.70	-0.06	36.89	1.35	34.67	-0.30	38.93	4.01	36.87	0.20	**1.43**	**2.42**
14	55.71	-0.14	37.77	-0.99	34.59	-0.96	33.95	-1.02	33.95	-0.97	36.13	-0.53	**-0.77**	**0.91**
15	55.55	-0.30	40.09	1.34	36.86	1.32	35.94	0.97	35.88	0.96	35.04	-1.63	**0.44**	**1.27**
17	56.19	0.34	41.75	3.00	39.80	4.25	38.48	3.51	38.37	3.45	37.89	1.23	**2.63**	**3.25**
18	55.31	-0.54	38.28	-0.48	34.80	-0.74	35.27	0.30	35.11	0.19	35.73	-0.94	**-0.37**	**0.64**
19	54.38	-1.47	36.88	-1.88	33.76	-1.78	33.86	-1.11	34.02	-0.90	34.81	-1.85	**-1.50**	**1.69**
20	52.63	-3.22	36.29	-2.47	32.38	-3.17	33.18	-1.79	32.71	-2.21	33.67	-2.99	**-2.64**	**2.95**
22	56.03	0.18	38.12	-0.64	33.85	-1.69	33.66	-1.31	32.98	-1.94	35.06	-1.60	**-1.17**	**1.51**
23	55.71	-0.14	39.24	0.49	35.39	-0.15	35.57	0.60	36.57	1.65	37.50	0.84	**0.55**	**0.90**
24	56.28	0.43	37.98	-0.78	36.34	0.79	34.98	0.01	35.48	0.56	36.44	-0.22	**0.13**	**0.60**
25	55.49	-0.36	37.60	-1.16	33.72	-1.83	33.72	-1.25	33.49	-1.44	34.46	-2.20	**-1.37**	**1.63**
26	55.78	-0.07	39.45	0.69	36.36	0.82	37.84	2.87	36.62	1.70	38.10	1.43	**1.24**	**1.69**
27	56.62	0.77	39.28	0.52	35.13	-0.41	35.23	0.26	34.16	-0.76	37.20	0.54	**0.15**	**0.63**
28	56.71	0.86	39.27	0.52	36.17	0.63	35.01	0.04	34.83	-0.09	37.19	0.53	**0.41**	**0.58**
29	57.29	1.44	39.31	0.55	35.74	0.19	34.98	0.01	38.03	3.11	41.77	5.10	**1.74**	**2.76**
30	54.82	-1.03	37.93	-0.83	34.86	-0.69	29.60	-5.37	31.82	-3.10	35.02	-1.64	**-2.11**	**2.94**
31	53.75	-2.10	39.11	0.36	37.30	1.76	36.36	1.39	36.93	2.01	39.32	2.65	**1.01**	**2.03**
32	58.59	2.74	42.52	3.76	38.65	3.11	39.72	4.75	39.22	4.30	42.85	6.19	**4.14**	**4.70**
33	55.71	-0.13	38.53	-0.22	35.36	-0.19	35.13	0.16	34.32	-0.61	35.03	-1.63	**-0.44**	**0.79**
34	61.24	5.39	42.29	3.53	36.95	1.41	36.58	1.61	38.32	3.40	38.27	1.60	**2.82**	**3.47**
35	54.72	-1.13	38.95	0.20	35.41	-0.14	36.40	1.43	35.69	0.77	36.31	-0.35	**0.13**	**0.90**
36	56.11	0.27	39.03	0.27	34.34	-1.21	36.21	1.24	34.22	-0.70	35.03	-1.63	**-0.29**	**1.12**
37	56.53	0.68	37.79	-0.97	33.54	-2.00	33.05	-1.92	32.73	-2.19	34.76	-1.90	**-1.38**	**1.87**
38	60.43	4.58	43.97	5.21	38.54	3.00	37.14	2.17	36.20	1.28	40.46	3.80	**3.34**	**3.95**
40	55.54	-0.31	38.92	0.17	36.26	0.72	36.26	1.29	35.09	0.17	37.33	0.67	**0.45**	**0.75**
113	53.81	-2.04	34.72	-4.03	33.66	-1.88	30.34	-4.63	32.61	-2.31	34.99	-1.67	**-2.76**	**3.27**
137	55.22	-0.62	36.39	-2.37	32.27	-3.27	31.66	-3.31	31.65	-3.27	33.50	-3.16	**-2.67**	**3.11**

[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*

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

12.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	145	144	144	
p_1	35	35	35	35	35	35	
m	55.85	38.76	35.54	34.97	34.92	36.66	
s_r	1.28	1.10	0.94	1.03	1.02	1.17	
CV_r	2.28	2.85	2.65	2.94	2.91	3.19	
r	3.61	3.12	2.67	2.91	2.87	3.31	
s_R	2.43	2.44	2.42	2.67	2.58	2.66	1.75
CV_R	4.34	6.29	6.80	7.65	7.39	7.25	
R	6.87	6.90	6.84	7.57	7.31	7.52	4.95
HORRAT[1]	1.99	2.73	2.91	3.27	3.15	3.12	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

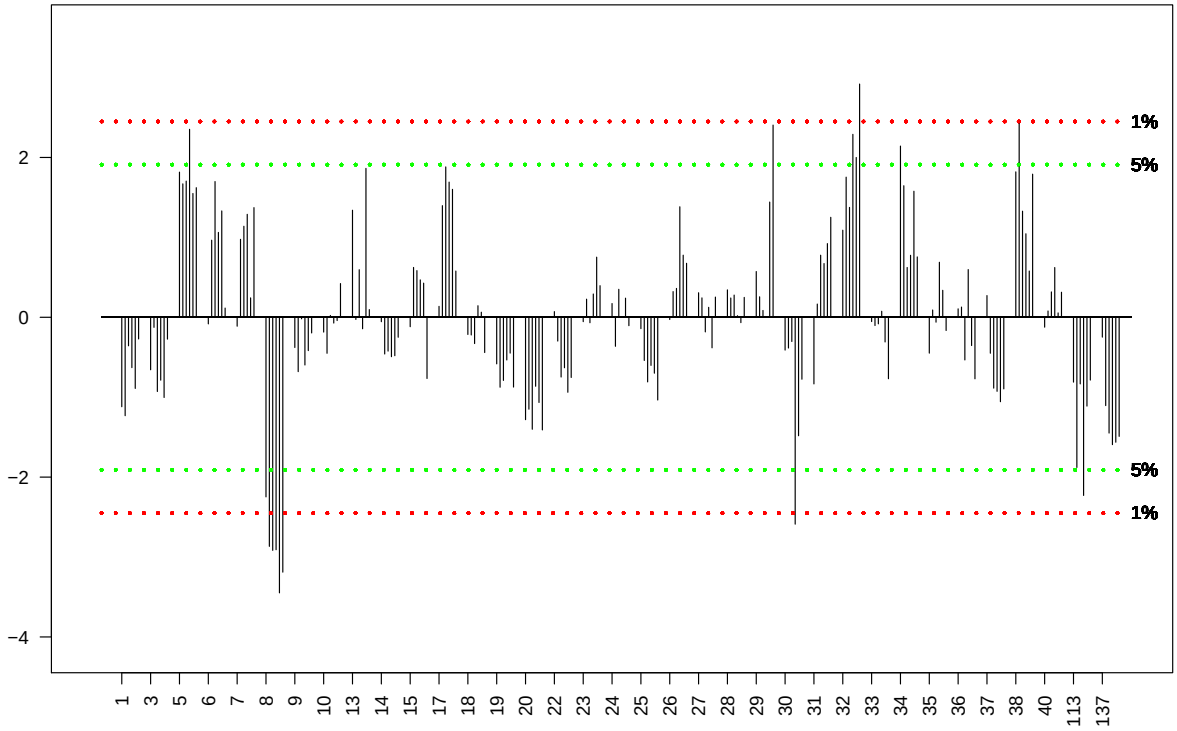
In the following table each lab is marked which was flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8					b	
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31	C	C		c		c
32						
33						
34				C		C
35						
36						
37						
38		C			C	
40						
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

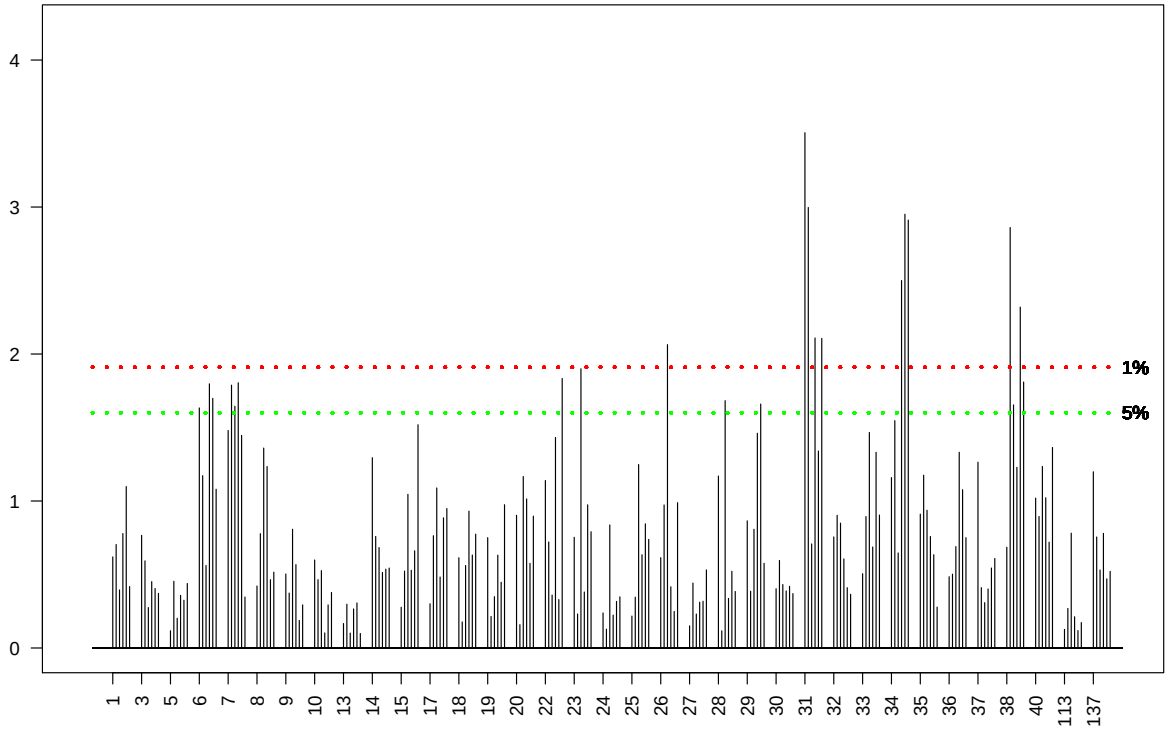
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

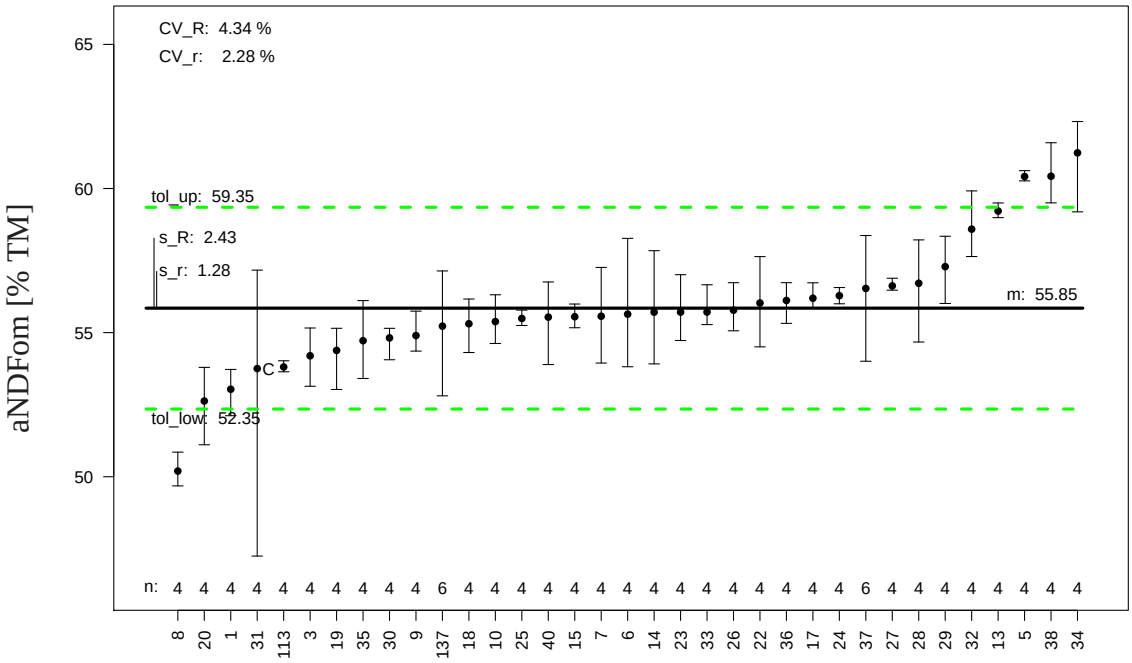
VDLUFA

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 2001:



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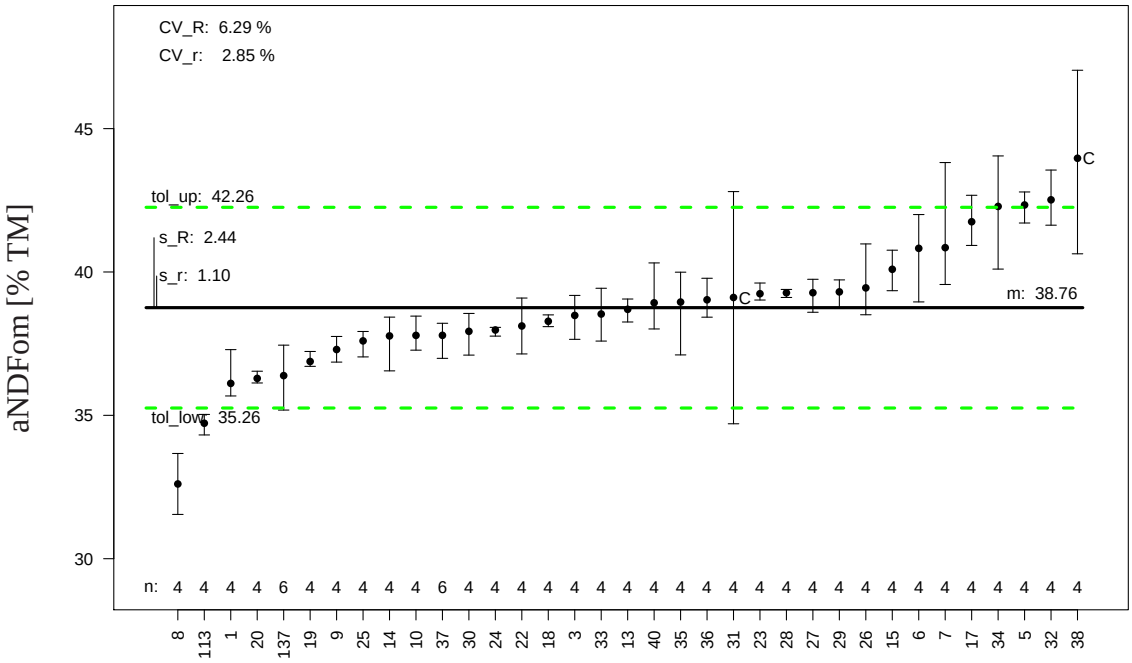
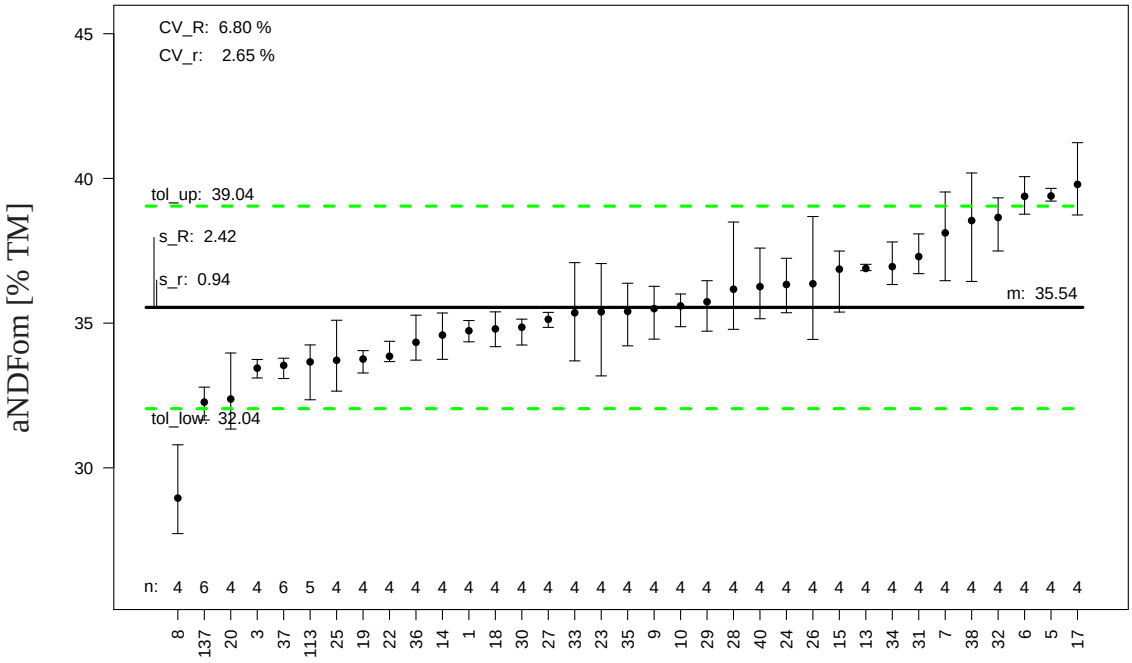
Probe/Sample 2002:



Probe/Sample 2003:



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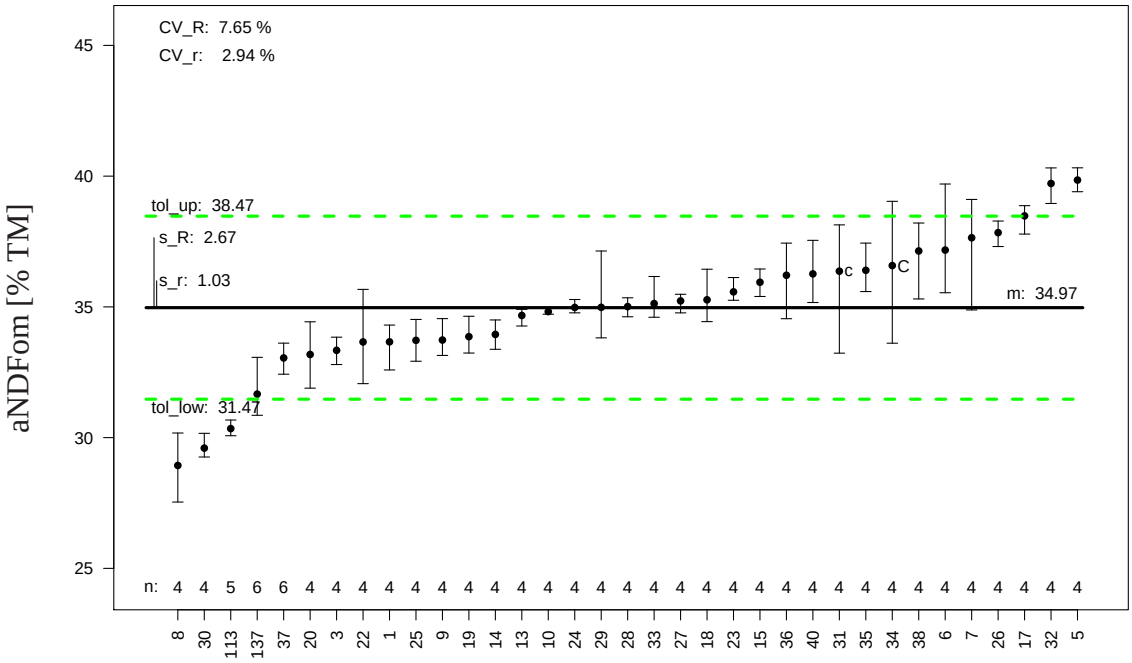
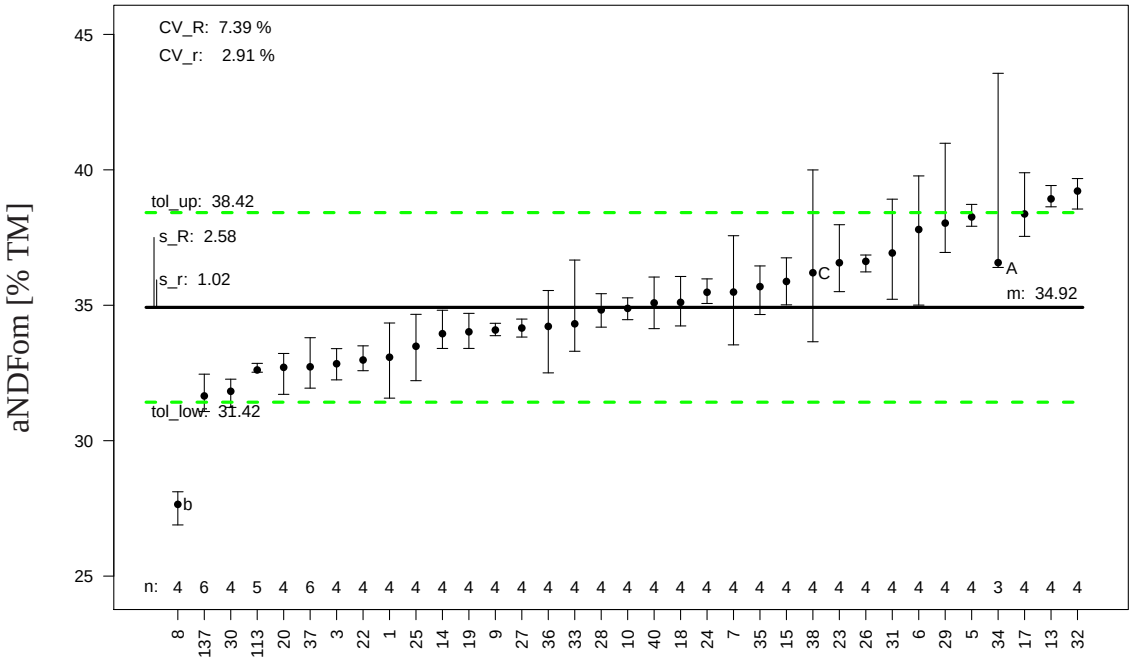
Probe/Sample 2004:

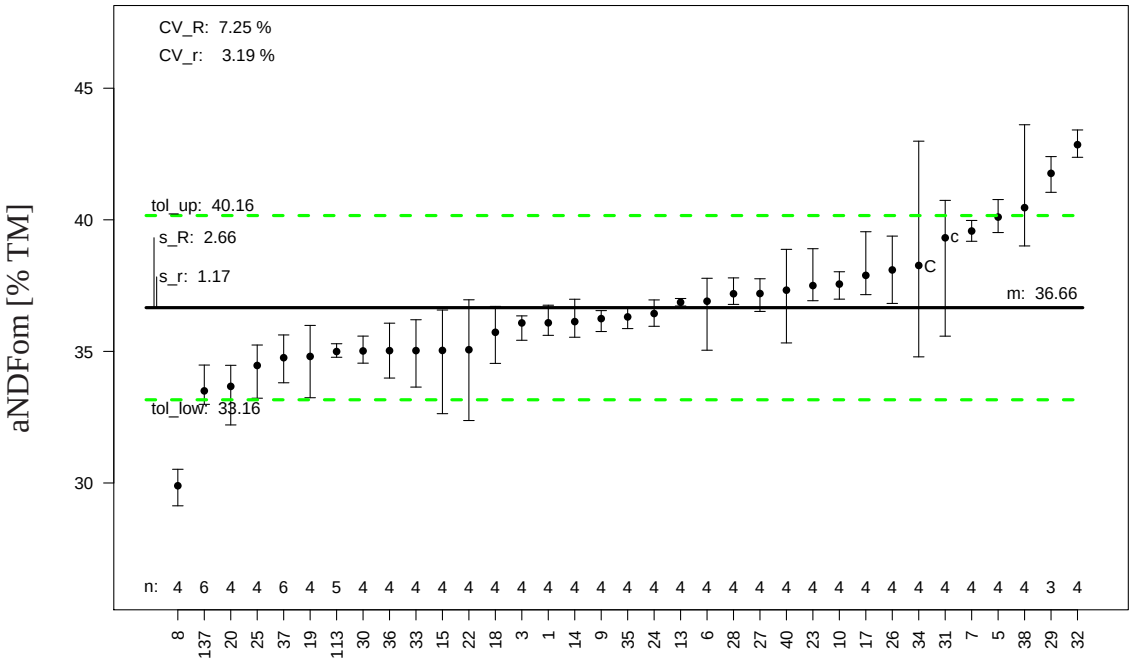


Probe/Sample 2005:



VDLUFA

Probe/Sample 2006:



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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.

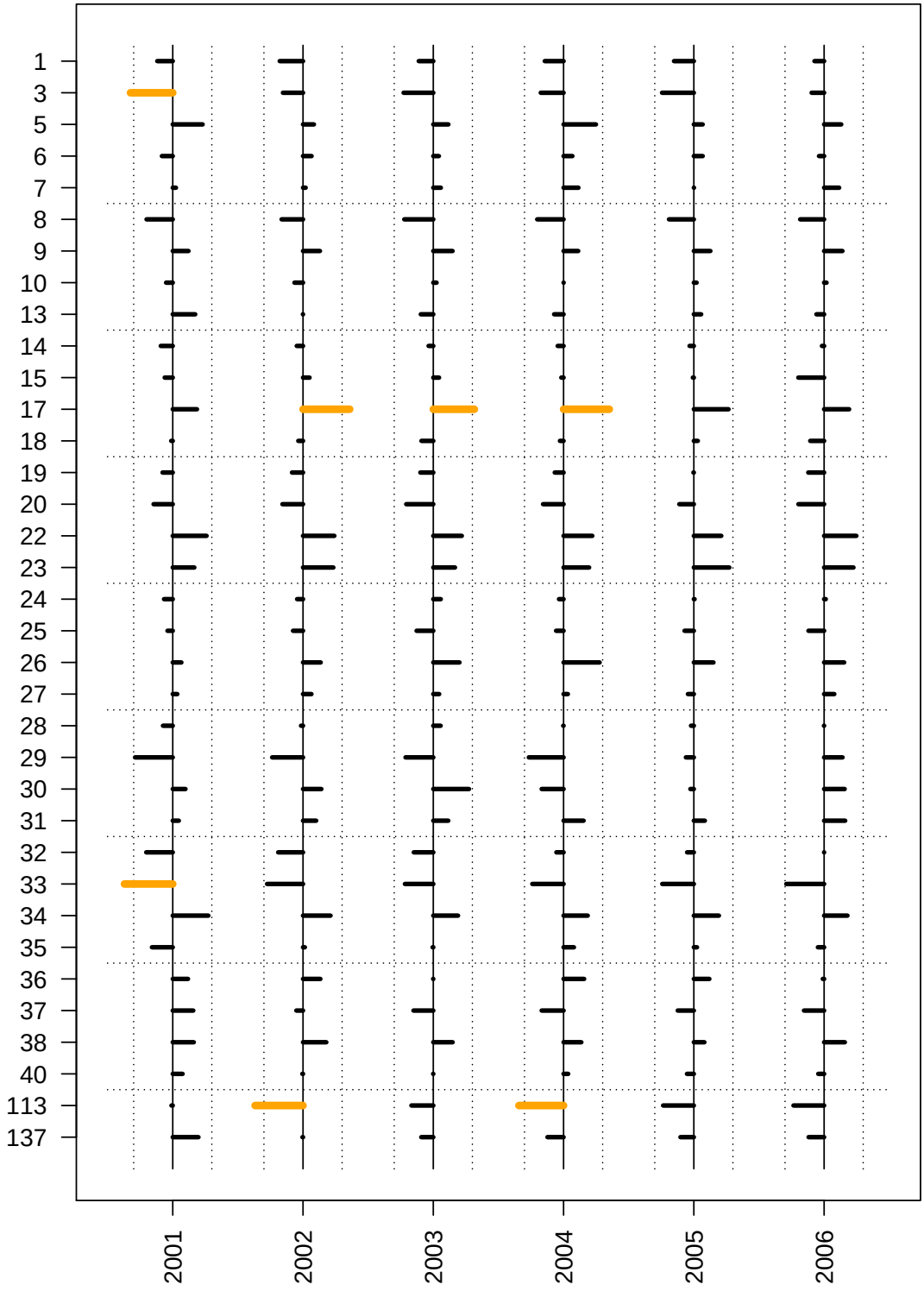
For calculation of the z scores the reproducibility of the method describe in VDLUFA ASR was used.

Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.1 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

z-Werte / z Scores



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Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

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Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	33.20	-0.87	22.13	-1.31	19.64	-0.82	19.63	-1.06	19.81	-1.11	20.83	-0.54	**-0.95**	**1.08**
3	31.69	-2.38	22.31	-1.13	18.79	-1.67	19.41	-1.28	19.14	-1.79	20.67	-0.70	**-1.49**	**1.74**
5	35.75	1.68	24.05	0.61	21.31	0.85	22.51	1.82	21.42	0.50	22.34	0.96	**1.07**	**1.30**
6	33.46	-0.61	23.92	0.48	20.77	0.31	21.19	0.50	21.42	0.50	21.08	-0.29	**0.15**	**0.51**
7	34.25	0.18	23.59	0.15	20.88	0.42	21.52	0.83	20.93	0.01	22.22	0.85	**0.41**	**0.57**
8	32.60	-1.47	22.23	-1.21	18.82	-1.63	19.21	-1.48	19.53	-1.40	20.02	-1.35	**-1.42**	**1.57**
9	34.95	0.88	24.39	0.95	21.54	1.08	21.51	0.82	21.86	0.93	22.40	1.03	**0.95**	**1.05**
10	33.70	-0.37	22.96	-0.48	20.64	0.18	20.70	0.00	21.08	0.15	21.51	0.14	**-0.06**	**0.30**
13	35.33	1.26	23.43	-0.01	19.75	-0.70	20.16	-0.53	21.34	0.41	20.94	-0.43	**0.00**	**0.74**
14	33.40	-0.67	23.09	-0.35	20.19	-0.27	20.36	-0.33	20.69	-0.24	21.25	-0.12	**-0.33**	**0.41**
15	33.62	-0.45	23.81	0.37	20.78	0.32	20.57	-0.13	20.87	-0.06	19.92	-1.45	**-0.23**	**0.72**
17	35.43	1.36	26.07	2.63	22.77	2.31	23.27	2.57	22.88	1.95	22.78	1.41	**2.04**	**2.30**
18	33.98	-0.09	23.17	-0.27	19.79	-0.66	20.49	-0.20	21.15	0.22	20.59	-0.78	**-0.30**	**0.49**
19	33.50	-0.57	22.82	-0.62	19.73	-0.73	20.20	-0.50	20.90	-0.02	20.48	-0.89	**-0.56**	**0.68**
20	32.99	-1.08	22.28	-1.16	18.93	-1.52	19.54	-1.15	20.11	-0.82	19.93	-1.45	**-1.20**	**1.34**
22	35.97	1.90	25.20	1.76	22.06	1.60	22.31	1.62	22.47	1.54	23.19	1.82	**1.71**	**1.88**
23	35.28	1.21	25.15	1.71	21.68	1.22	22.13	1.44	22.92	1.99	23.02	1.65	**1.54**	**1.71**
24	33.58	-0.49	23.11	-0.33	20.88	0.42	20.44	-0.26	20.97	0.04	21.46	0.09	**-0.09**	**0.35**
25	33.77	-0.30	22.88	-0.56	19.52	-0.94	20.27	-0.42	20.40	-0.52	20.49	-0.88	**-0.60**	**0.71**
26	34.55	0.48	24.43	0.99	21.93	1.47	22.72	2.03	22.03	1.10	22.50	1.13	**1.20**	**1.41**
27	34.33	0.26	23.91	0.47	20.79	0.33	20.93	0.24	20.60	-0.33	21.94	0.57	**0.26**	**0.42**
28	33.52	-0.55	23.33	-0.11	20.87	0.41	20.67	-0.02	20.77	-0.16	21.36	-0.01	**-0.07**	**0.32**
29	31.95	-2.12	21.70	-1.74	18.89	-1.56	18.74	-1.95	20.48	-0.45	22.41	1.04	**-1.13**	**1.73**
30	34.79	0.72	24.47	1.03	22.46	2.01	19.46	-1.23	20.73	-0.20	22.53	1.16	**0.58**	**1.30**
31	34.41	0.34	24.18	0.74	21.30	0.84	21.82	1.13	21.55	0.62	22.56	1.19	**0.81**	**0.94**
32	32.58	-1.49	22.04	-1.40	19.36	-1.10	20.29	-0.40	20.55	-0.38	21.37	-0.00	**-0.79**	**1.07**
33	31.35	-2.72	21.42	-2.02	18.86	-1.60	18.93	-1.76	19.15	-1.78	19.24	-2.13	**-2.00**	**2.23**
34	36.07	2.00	24.99	1.55	21.85	1.39	22.05	1.36	22.34	1.41	22.68	1.31	**1.50**	**1.67**
35	32.90	-1.17	23.54	0.10	20.42	-0.04	21.27	0.58	21.10	0.17	21.02	-0.35	**-0.12**	**0.61**
36	34.93	0.86	24.41	0.98	20.45	-0.01	21.85	1.16	21.80	0.87	21.30	-0.07	**0.63**	**0.87**
37	35.22	1.15	23.06	-0.38	19.34	-1.11	19.46	-1.23	20.02	-0.91	20.24	-1.13	**-0.60**	**1.13**
38	35.25	1.18	24.75	1.31	21.55	1.09	21.69	1.00	21.52	0.59	22.54	1.17	**1.06**	**1.18**
40	34.62	0.55	23.40	-0.04	20.45	-0.01	20.95	0.26	20.54	-0.39	21.04	-0.33	**0.01**	**0.35**
113	34.00	-0.07	20.74	-2.70	19.23	-1.23	18.18	-2.51	19.20	-1.73	19.65	-1.72	**-1.66**	**2.05**
137	35.52	1.45	23.41	-0.03	19.78	-0.68	19.79	-0.91	20.18	-0.75	20.50	-0.87	**-0.30**	**0.97**

[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*

VDLUFA

13.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	145	145	144	
p_1	35	35	35	35	35	35	
m	34.07	23.44	20.46	20.69	20.93	21.37	
s_r	0.48	0.35	0.49	0.38	0.42	0.53	
CV_r	1.41	1.51	2.38	1.82	2.01	2.47	
r	1.36	1.00	1.38	1.06	1.19	1.49	
s_R	1.29	1.19	1.19	1.28	1.04	1.16	1.10
CV_R	3.79	5.07	5.83	6.17	4.98	5.43	
R	3.65	3.36	3.37	3.61	2.95	3.29	3.11
HORRAT[1]	1.61	2.04	2.30	2.43	1.97	2.15	

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

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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 flaged as an outlier for a sample.

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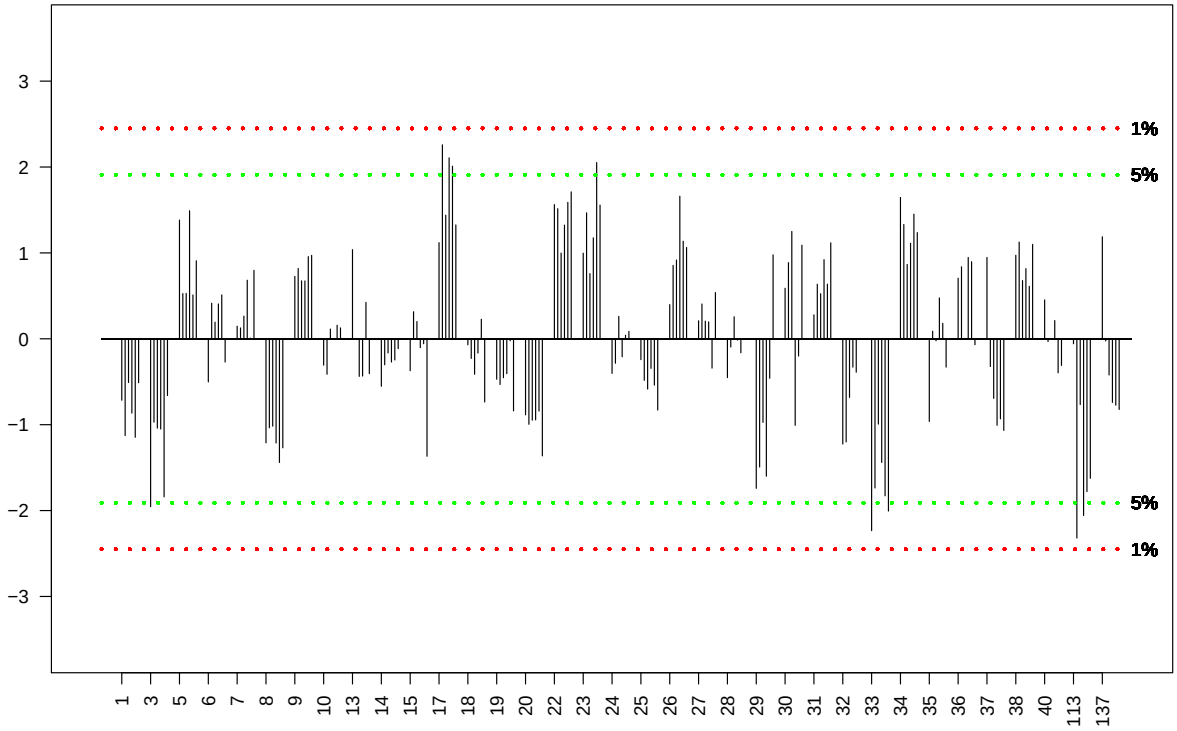
Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23			C			
24						
25						
26			C			
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
40	c					
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

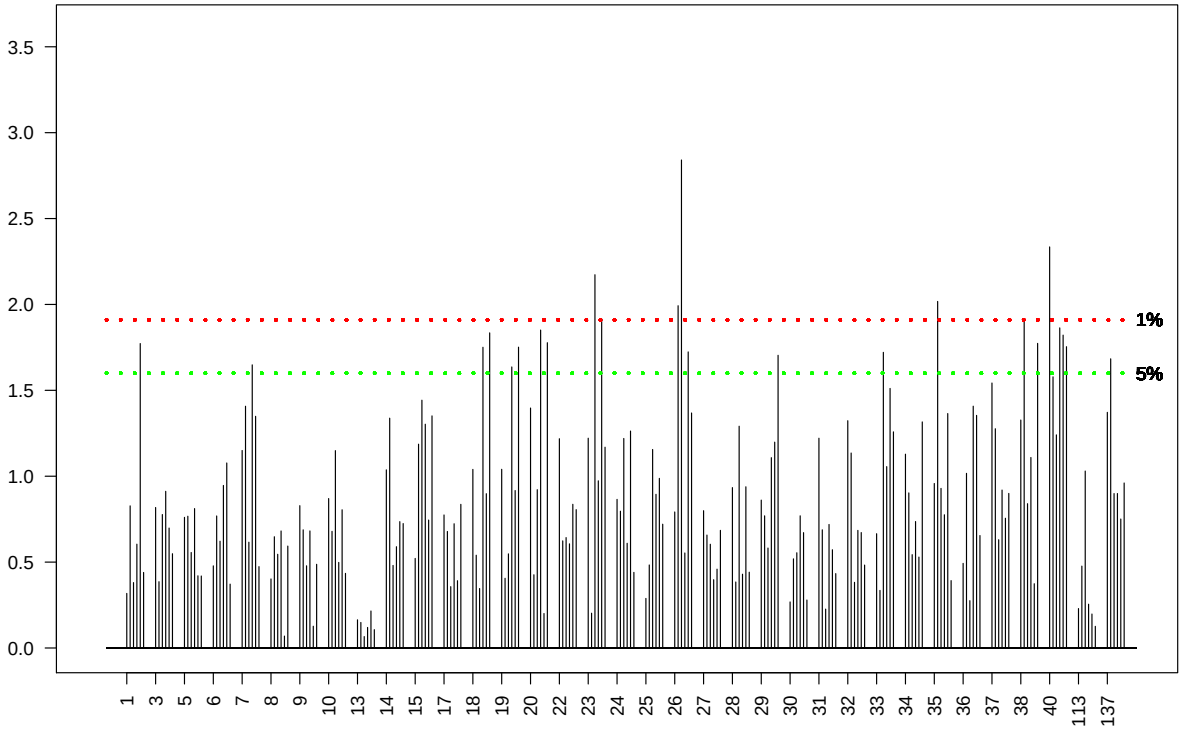
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA

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.

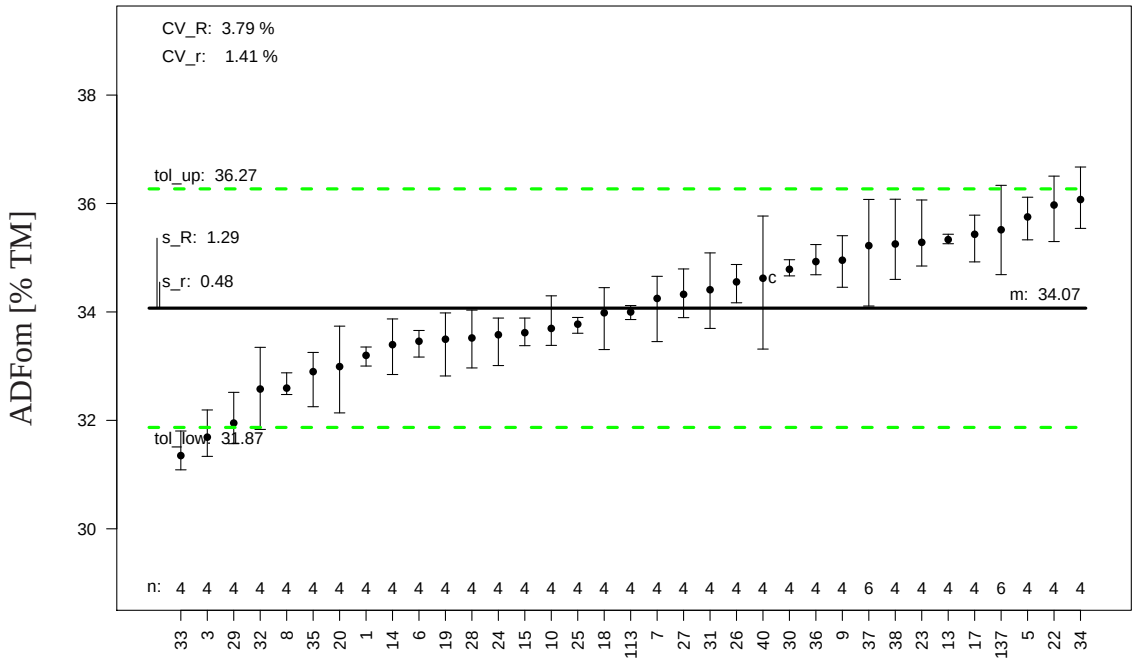
VDLUFA

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.

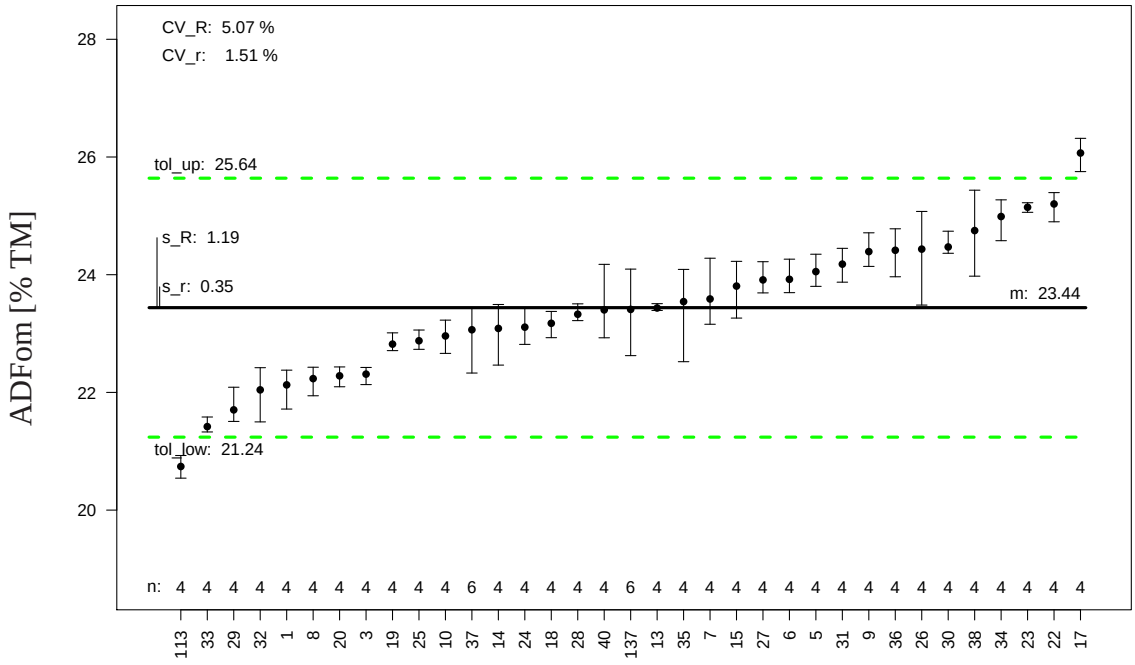
The solid, horizontal line is the mean of analyses from this proficiency test. The dashed lines - if given - mark the "true value". The green, dashed lines mark the tolerance limits calculated with the reproducibility from the method description, if given, else the reproducibility from this proficiency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

Probe/Sample 2001:

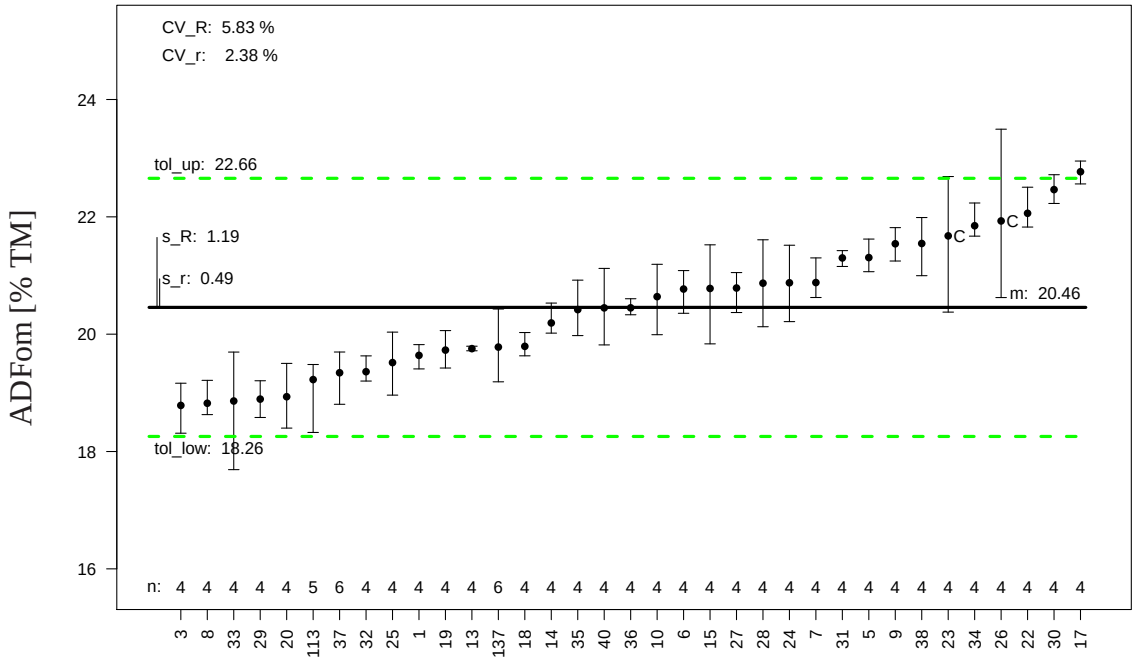


VDLUFA

Probe/Sample 2002:

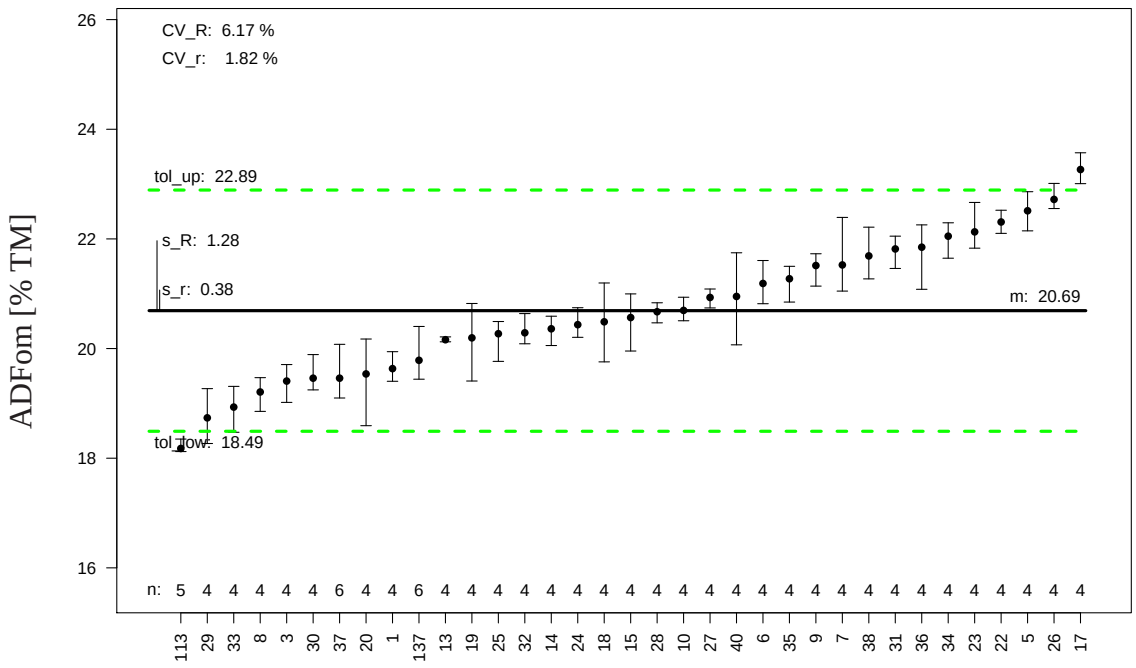


Probe/Sample 2003:

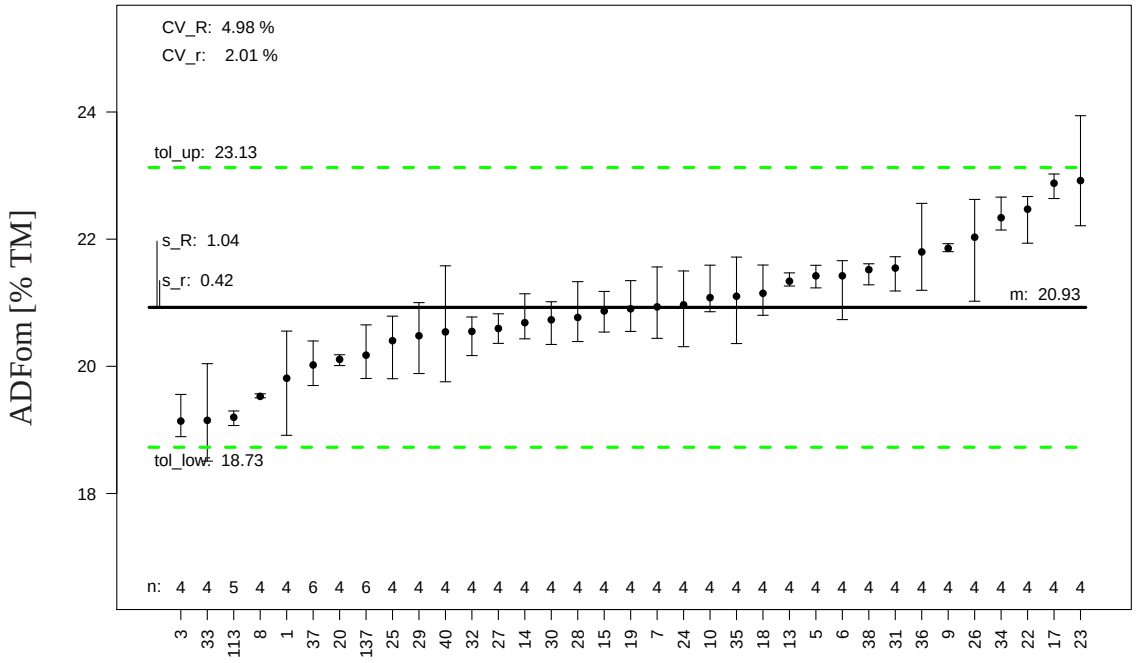


VDLUFA

Probe/Sample 2004:

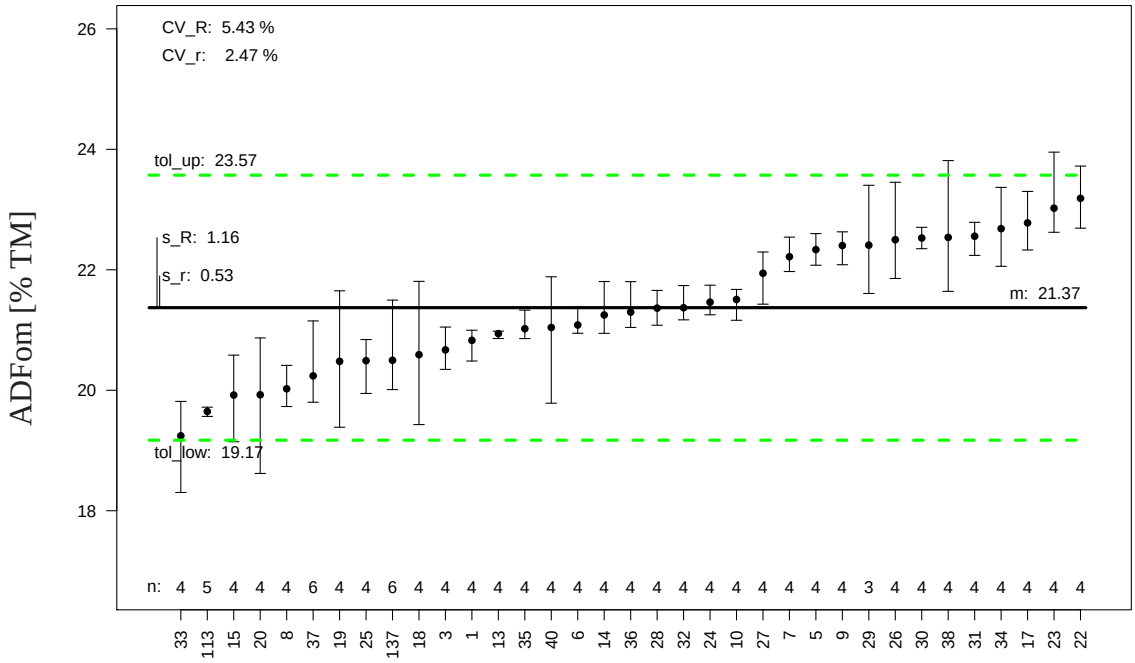


Probe/Sample 2005:



VDLUFA

Probe/Sample 2006:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

14 Merkmal / Constituent: ADL

Einheit / Unit: % TM

14.1 Anmerkungen / Annotations

14.2 Laborbeurteilung / Proficiency Test

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

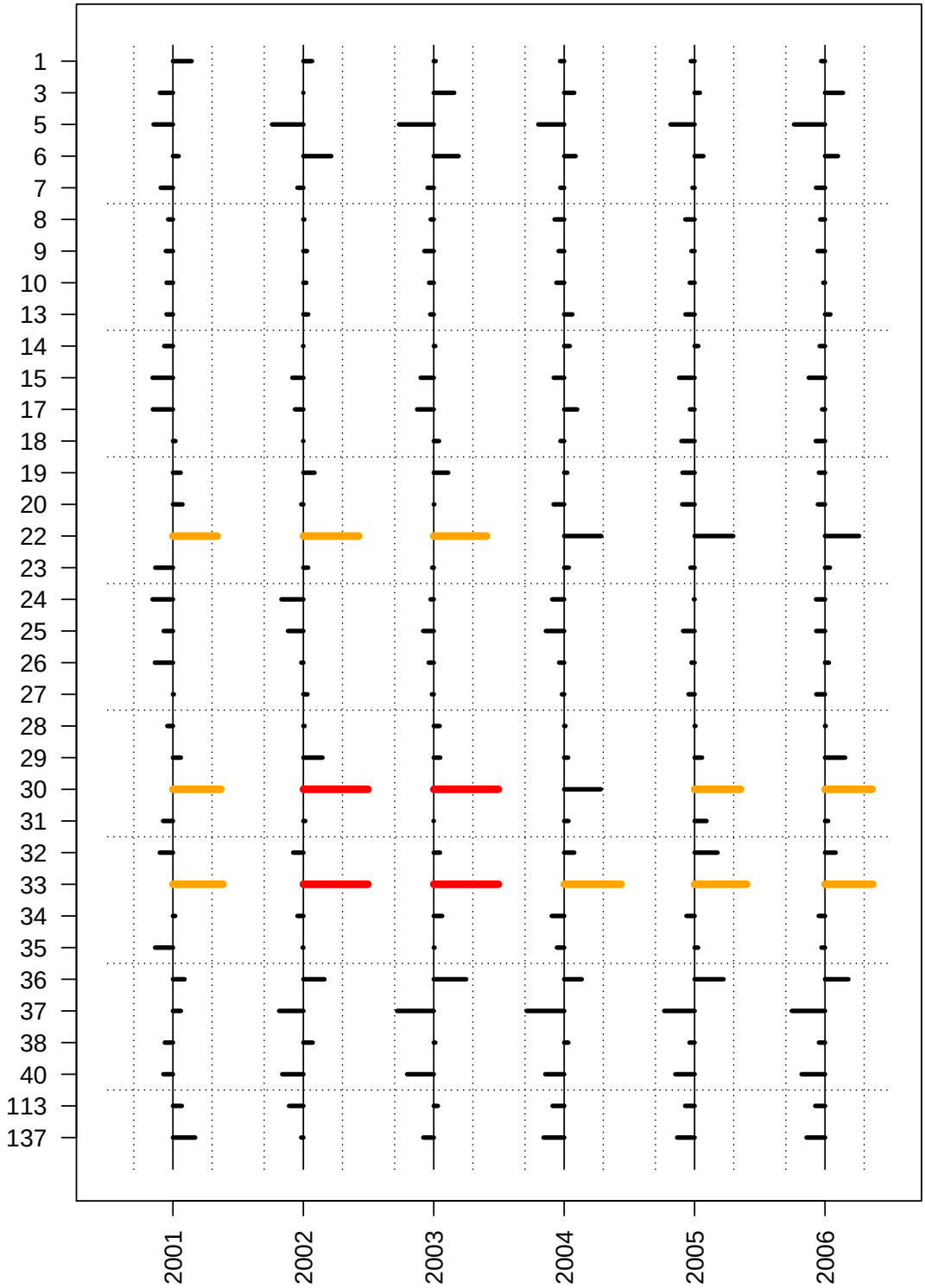
Vergleichbarkeit / reproducibility Zur Berechnung der z-Werte wird die Vergleichbarkeit, wie sie in in diesem Ringversuch bestimmt worden ist, herangezogen.

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

ADL

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

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Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	3.24	0.23	1.79	0.06	1.56	0.01	1.42	-0.04	1.43	-0.04	1.35	-0.04	**0.03**	**0.11**
3	2.86	-0.16	1.72	-0.00	1.71	0.16	1.55	0.09	1.53	0.06	1.59	0.20	**0.06**	**0.14**
5	2.78	-0.23	1.50	-0.22	1.27	-0.27	1.22	-0.24	1.22	-0.25	1.05	-0.34	**-0.26**	**0.29**
6	3.09	0.07	1.92	0.20	1.75	0.20	1.56	0.11	1.56	0.09	1.54	0.14	**0.13**	**0.16**
7	2.87	-0.15	1.68	-0.04	1.50	-0.05	1.42	-0.04	1.45	-0.02	1.29	-0.10	**-0.07**	**0.09**
8	2.96	-0.06	1.73	0.01	1.52	-0.02	1.37	-0.09	1.37	-0.10	1.34	-0.05	**-0.05**	**0.07**
9	2.93	-0.09	1.75	0.03	1.47	-0.07	1.40	-0.05	1.44	-0.03	1.31	-0.08	**-0.05**	**0.07**
10	2.94	-0.08	1.75	0.02	1.51	-0.04	1.38	-0.07	1.42	-0.05	1.38	-0.02	**-0.04**	**0.06**
13	2.94	-0.08	1.76	0.03	1.52	-0.03	1.53	0.08	1.38	-0.09	1.45	0.06	**-0.01**	**0.07**
14	2.91	-0.11	1.72	-0.00	1.56	0.01	1.51	0.05	1.51	0.04	1.34	-0.06	**-0.01**	**0.06**
15	2.77	-0.25	1.65	-0.08	1.44	-0.10	1.36	-0.10	1.31	-0.16	1.21	-0.18	**-0.14**	**0.17**
17	2.77	-0.24	1.67	-0.06	1.42	-0.13	1.58	0.12	1.42	-0.05	1.36	-0.03	**-0.07**	**0.14**
18	3.05	0.03	1.72	-0.00	1.59	0.04	1.42	-0.03	1.33	-0.14	1.29	-0.10	**-0.03**	**0.08**
19	3.11	0.09	1.80	0.08	1.66	0.11	1.48	0.03	1.34	-0.13	1.33	-0.07	**0.02**	**0.10**
20	3.13	0.12	1.71	-0.01	1.55	0.00	1.36	-0.10	1.34	-0.13	1.32	-0.08	**-0.03**	**0.10**
22	3.55	0.53	2.12	0.39	1.97	0.42	1.80	0.34	1.88	0.40	1.77	0.38	**0.41**	**0.45**
23	2.80	-0.21	1.76	0.03	1.54	-0.01	1.50	0.04	1.43	-0.04	1.45	0.06	**-0.02**	**0.10**
24	2.77	-0.25	1.57	-0.15	1.52	-0.03	1.34	-0.11	1.46	-0.01	1.29	-0.10	**-0.11**	**0.15**
25	2.90	-0.11	1.62	-0.11	1.47	-0.08	1.29	-0.17	1.35	-0.12	1.30	-0.10	**-0.12**	**0.13**
26	2.80	-0.22	1.71	-0.01	1.51	-0.04	1.41	-0.05	1.44	-0.03	1.44	0.04	**-0.05**	**0.10**
27	3.03	0.01	1.75	0.03	1.53	-0.01	1.43	-0.02	1.41	-0.06	1.30	-0.10	**-0.03**	**0.05**
28	2.95	-0.07	1.73	0.01	1.60	0.05	1.47	0.01	1.47	0.00	1.40	0.01	**0.00**	**0.04**
29	3.11	0.10	1.86	0.14	1.60	0.05	1.49	0.04	1.55	0.08	1.62	0.22	**0.10**	**0.13**
30	3.60	0.58	2.33	0.61	2.21	0.66	1.79	0.34	1.95	0.48	1.92	0.52	**0.53**	**0.59**
31	2.90	-0.12	1.74	0.01	1.55	-0.00	1.50	0.04	1.60	0.12	1.43	0.03	**0.02**	**0.08**
32	2.86	-0.16	1.65	-0.07	1.60	0.05	1.55	0.09	1.71	0.24	1.51	0.12	**0.04**	**0.15**
33	3.62	0.61	2.33	0.61	2.23	0.68	1.98	0.53	2.02	0.54	1.93	0.53	**0.58**	**0.64**
34	3.04	0.03	1.68	-0.04	1.61	0.07	1.34	-0.12	1.39	-0.09	1.32	-0.07	**-0.04**	**0.08**
35	2.80	-0.22	1.72	-0.01	1.55	0.01	1.39	-0.07	1.51	0.04	1.36	-0.04	**-0.05**	**0.10**
36	3.16	0.14	1.87	0.15	1.80	0.26	1.62	0.16	1.77	0.30	1.65	0.26	**0.21**	**0.24**
37	3.11	0.10	1.55	-0.17	1.26	-0.29	1.11	-0.35	1.15	-0.32	1.03	-0.37	**-0.23**	**0.31**
38	2.92	-0.10	1.79	0.07	1.56	0.01	1.49	0.04	1.42	-0.05	1.33	-0.07	**-0.02**	**0.07**
40	2.90	-0.12	1.58	-0.15	1.34	-0.21	1.28	-0.17	1.27	-0.20	1.13	-0.26	**-0.19**	**0.21**
113	3.12	0.11	1.62	-0.10	1.58	0.03	1.35	-0.11	1.37	-0.10	1.29	-0.11	**-0.05**	**0.11**
137	3.28	0.27	1.71	-0.01	1.47	-0.08	1.27	-0.19	1.29	-0.18	1.19	-0.20	**-0.07**	**0.20**

[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*

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14.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006
n	144	144	145	145	145	144
p	35	35	35	35	35	35
n_1	144	136	137	145	145	144
p_1	35	33	33	35	35	35
m	3.02	1.72	1.55	1.46	1.47	1.39
s_r	0.09	0.09	0.08	0.07	0.07	0.08
CV_r	2.82	5.18	5.10	4.63	4.99	5.83
r	0.24	0.25	0.22	0.19	0.21	0.23
s_R	0.24	0.14	0.15	0.18	0.20	0.22
CV_R	7.84	8.03	9.98	12.42	13.92	15.59
R	0.67	0.39	0.44	0.51	0.58	0.62
HORRAT[1]	2.31	2.18	2.67	3.29	3.69	4.10

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

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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 flaged as an outlier for a sample.

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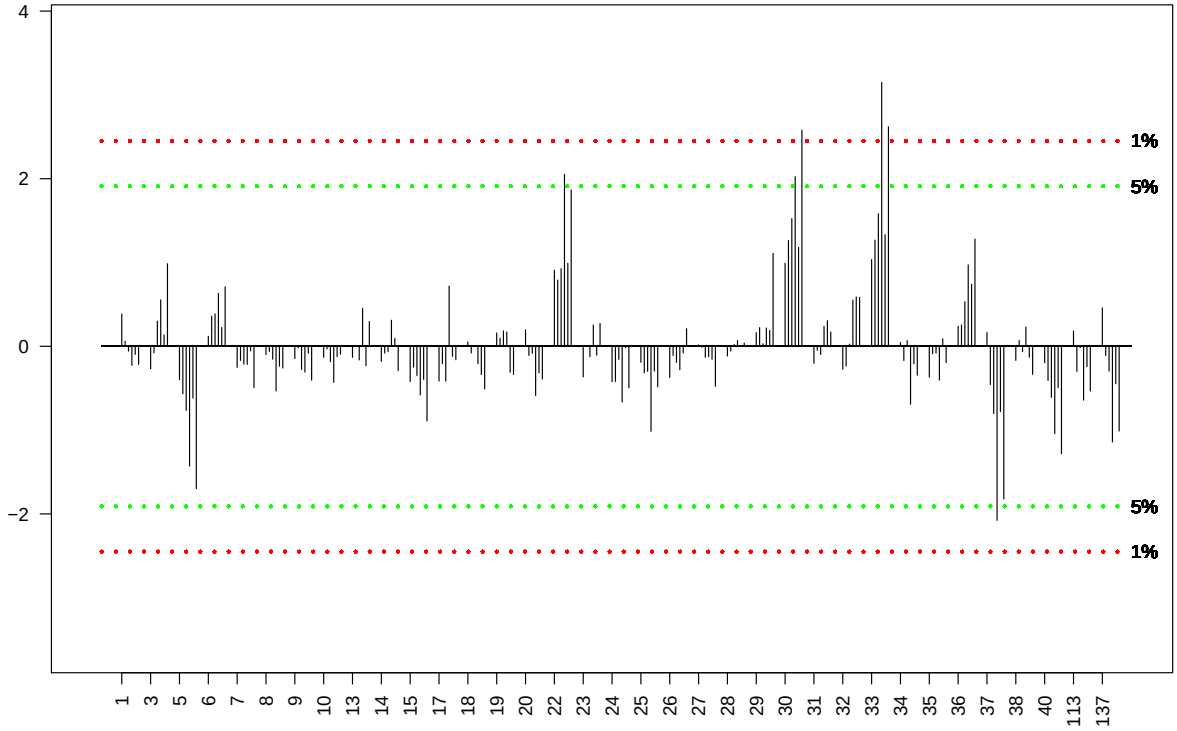
Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8						
9						
10						
13						
14	C					
15						
17			C			
18						
19						
20						
22		B	b			
23						
24						
25						
26						
27						
28						
29						c
30	b	B	B		b	b
31		C		c		
32						
33	b	B	B	b	b	b
34						
35						
36						
37						
38		c			C	
40						
113						
137						

VDLUFA

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.

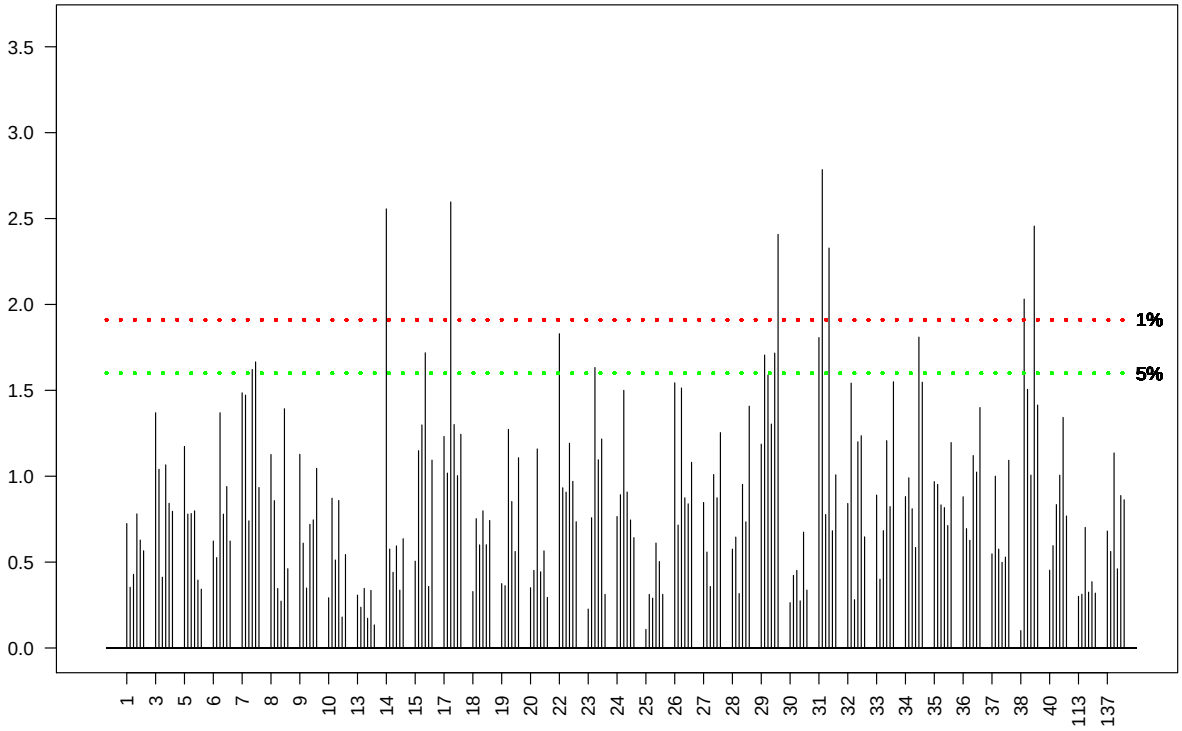
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

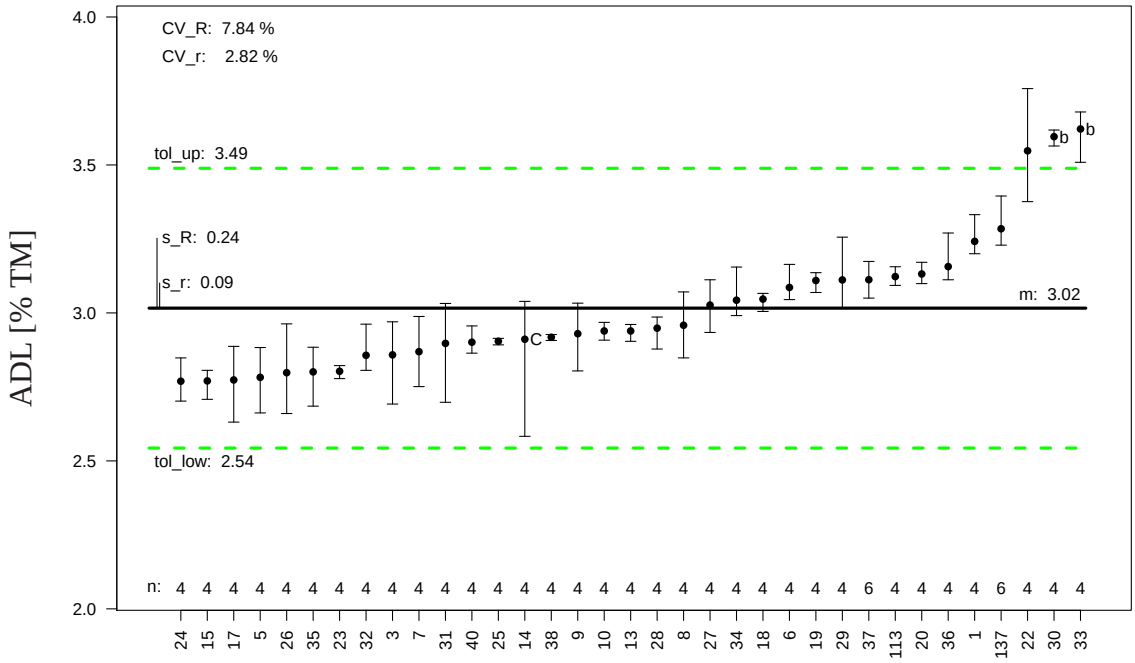
VDLUFA

14.4 Einzelproben / Single Samples

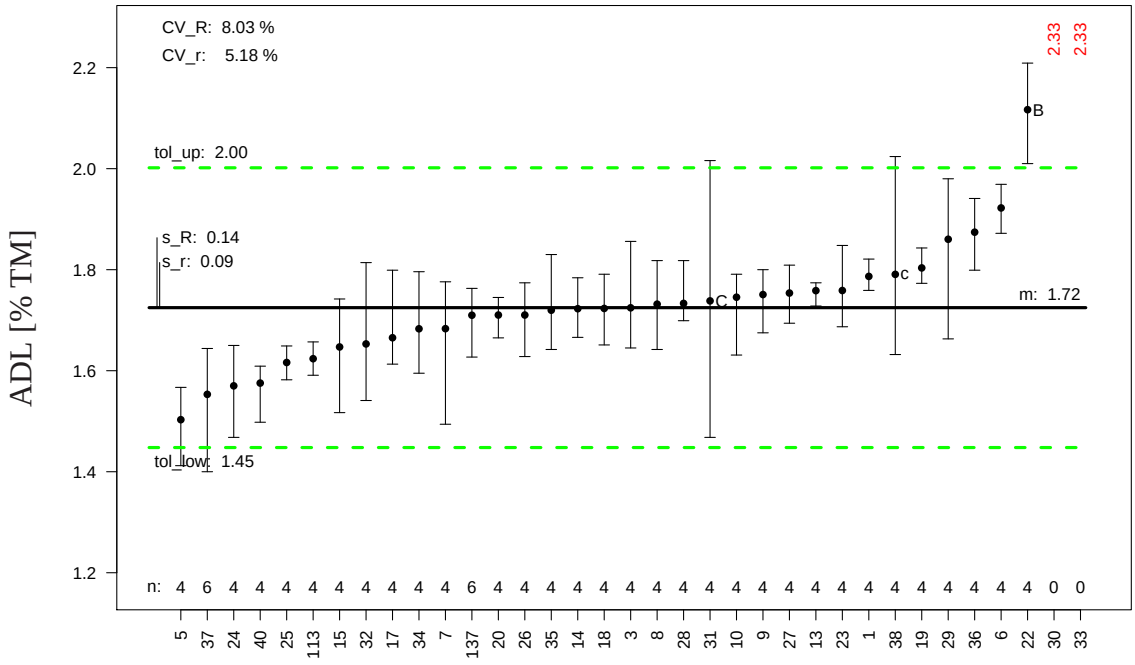
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden -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

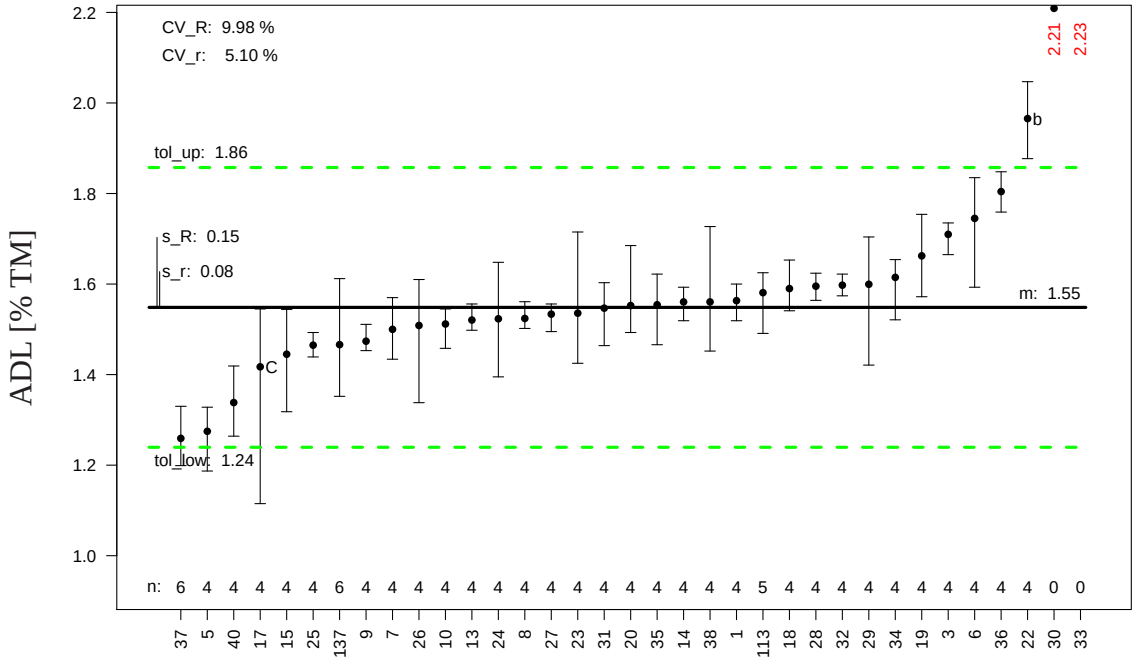
Probe/Sample 2001:



Probe/Sample 2002:



Probe/Sample 2003:



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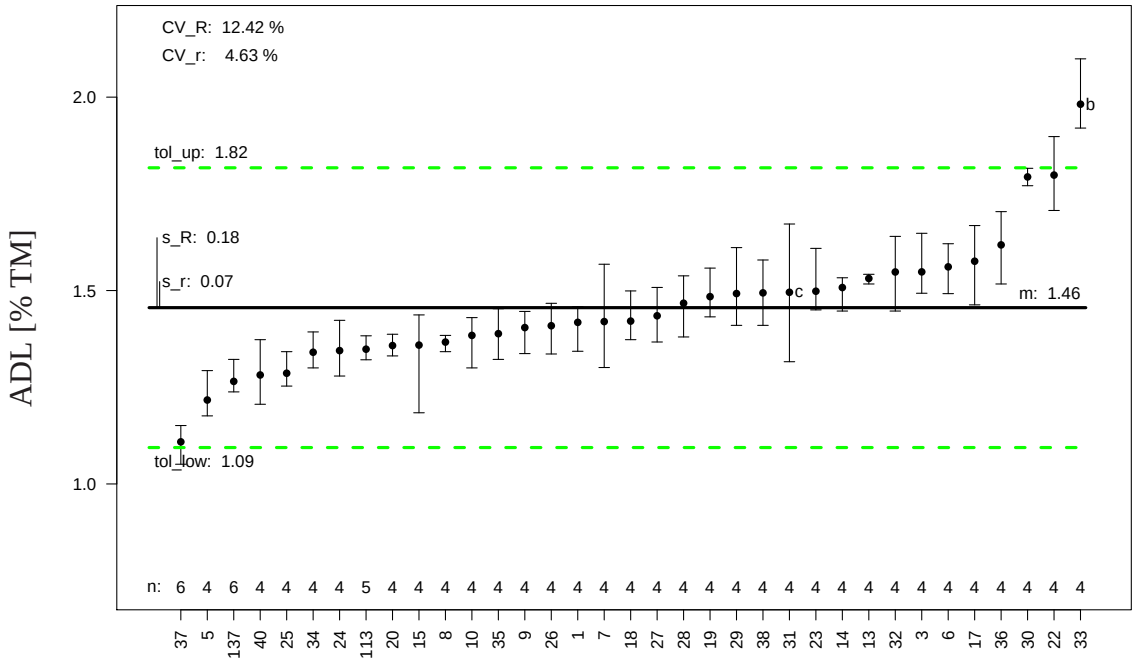
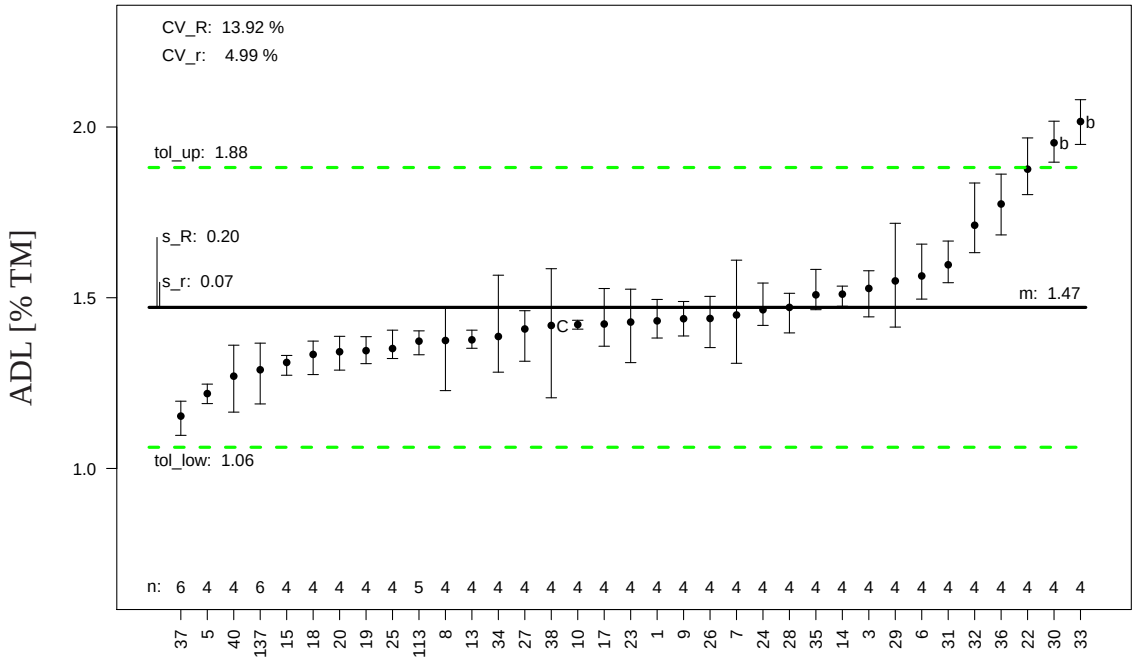
Probe/Sample 2004:



Probe/Sample 2005:



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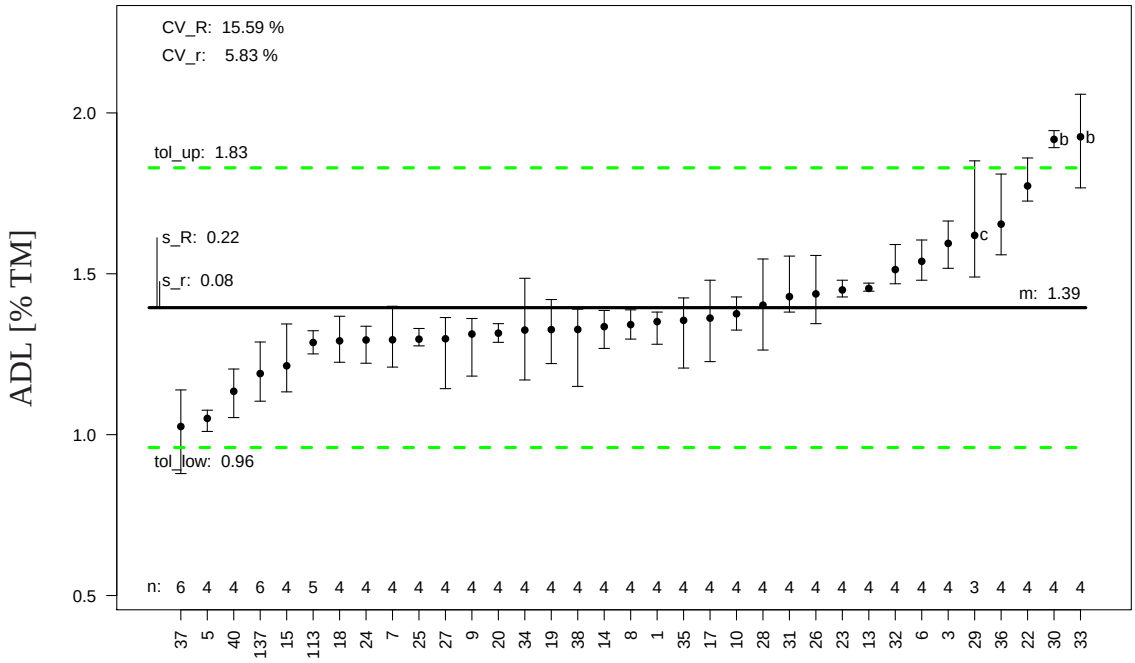
Probe/Sample 2006:



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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.

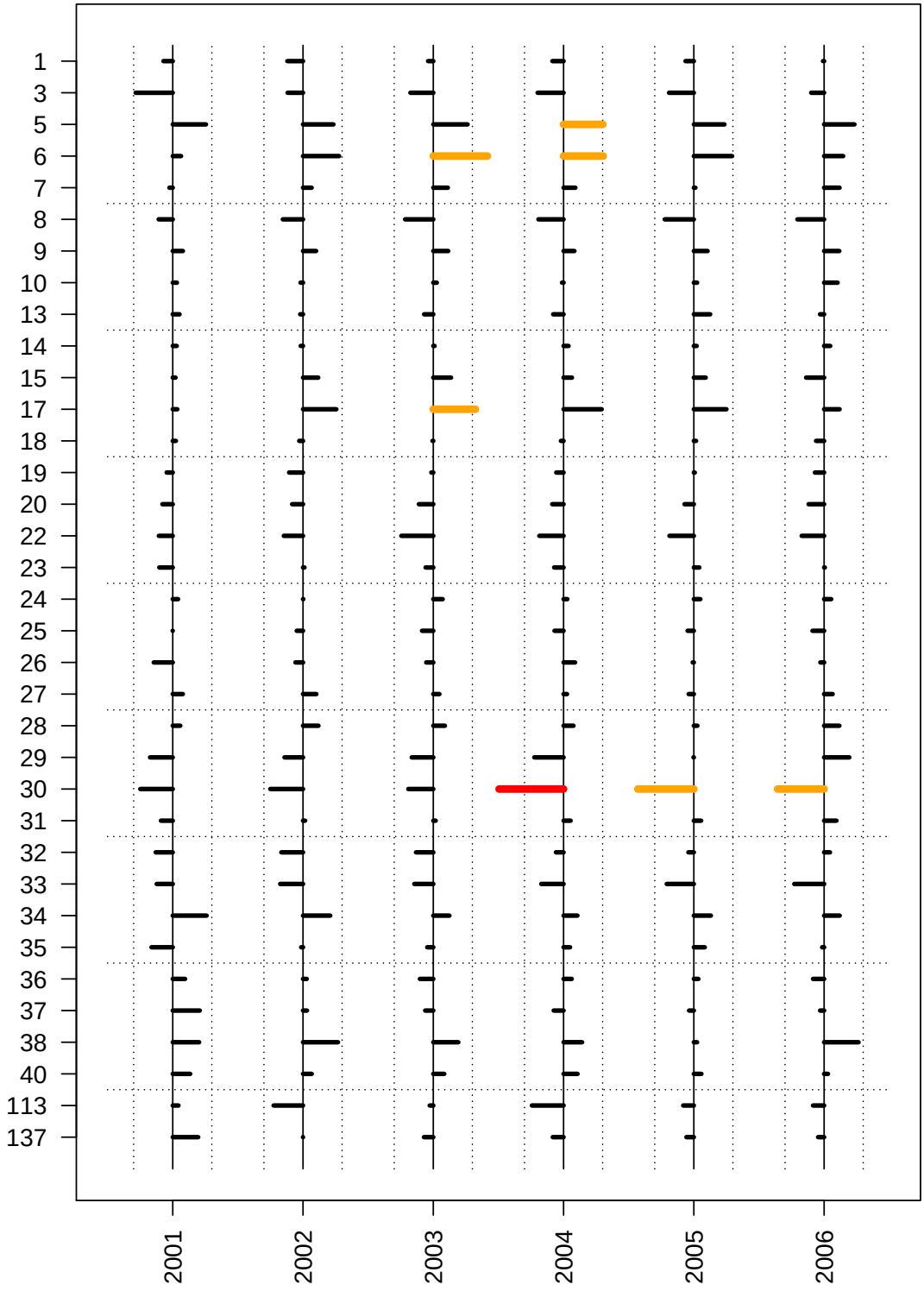
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.75 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

NDF

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

NDF

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	55.23	-0.83	40.15	-1.40	36.92	-0.47	36.17	-1.00	36.85	-0.75	38.61	-0.10	**-0.76**	**0.94**
3	52.75	-3.32	40.17	-1.38	35.34	-2.05	34.85	-2.32	35.37	-2.22	37.55	-1.16	**-2.07**	**2.40**
5	59.04	2.98	44.28	2.73	40.45	3.07	40.69	3.52	40.34	2.74	41.43	2.72	**2.96**	**3.26**
6	56.81	0.74	44.78	3.23	42.24	4.85	40.72	3.55	41.02	3.43	40.42	1.71	**2.92**	**3.51**
7	55.77	-0.30	42.32	0.77	38.68	1.30	38.23	1.06	37.73	0.14	40.09	1.38	**0.72**	**1.04**
8	54.80	-1.26	39.74	-1.81	34.86	-2.53	34.92	-2.25	34.98	-2.61	36.32	-2.39	**-2.14**	**2.40**
9	56.97	0.91	42.72	1.17	38.72	1.33	38.14	0.97	38.82	1.23	40.07	1.36	**1.16**	**1.29**
10	56.44	0.37	41.33	-0.22	37.70	0.31	37.03	-0.14	37.89	0.29	39.92	1.21	**0.30**	**0.61**
13	56.67	0.61	41.30	-0.25	36.56	-0.82	36.24	-0.93	39.06	1.46	38.34	-0.37	**-0.05**	**0.92**
14	56.42	0.36	41.35	-0.21	37.50	0.12	37.62	0.44	37.85	0.26	39.26	0.55	**0.25**	**0.39**
15	56.31	0.24	42.91	1.36	38.97	1.59	37.92	0.75	38.65	1.06	37.10	-1.61	**0.57**	**1.32**
17	56.47	0.41	44.53	2.98	41.16	3.77	40.59	3.41	40.51	2.92	40.09	1.38	**2.48**	**3.01**
18	56.34	0.28	41.21	-0.34	37.31	-0.07	36.94	-0.23	37.79	0.20	37.99	-0.72	**-0.15**	**0.40**
19	55.52	-0.55	40.31	-1.24	37.21	-0.17	36.52	-0.65	37.68	0.08	37.89	-0.82	**-0.56**	**0.77**
20	55.14	-0.93	40.58	-0.97	36.09	-1.29	36.15	-1.02	36.76	-0.83	37.32	-1.39	**-1.07**	**1.20**
22	54.82	-1.24	39.83	-1.72	34.52	-2.86	35.00	-2.17	35.41	-2.18	36.70	-2.01	**-2.03**	**2.29**
23	54.86	-1.20	41.68	0.13	36.69	-0.69	36.33	-0.84	38.09	0.49	38.77	0.06	**-0.34**	**0.76**
24	56.54	0.47	41.58	0.03	38.22	0.84	37.51	0.34	38.18	0.59	39.34	0.63	**0.48**	**0.60**
25	56.06	-0.01	40.99	-0.56	36.38	-1.01	36.36	-0.81	37.04	-0.56	37.67	-1.04	**-0.67**	**0.82**
26	54.36	-1.70	40.87	-0.68	36.75	-0.63	38.20	1.03	37.49	-0.10	38.37	-0.34	**-0.40**	**0.99**
27	56.96	0.90	42.75	1.19	37.93	0.55	37.48	0.31	37.13	-0.47	39.47	0.76	**0.54**	**0.83**
28	56.74	0.67	42.93	1.38	38.42	1.04	38.06	0.89	37.91	0.31	40.08	1.37	**0.94**	**1.11**
29	54.03	-2.03	39.89	-1.66	35.45	-1.93	34.55	-2.62	37.56	-0.03	40.96	2.25	**-1.00**	**2.12**
30	53.16	-2.91	38.62	-2.93	35.15	-2.24	29.16	-8.01	32.57	-5.02	34.54	-4.17	**-4.21**	**5.08**
31	55.01	-1.06	41.74	0.18	37.60	0.21	37.80	0.63	38.25	0.65	39.82	1.11	**0.29**	**0.80**
32	54.54	-1.53	39.61	-1.94	35.84	-1.55	36.49	-0.69	37.11	-0.49	39.23	0.52	**-0.94**	**1.38**
33	54.63	-1.44	39.51	-2.04	35.68	-1.70	35.18	-1.99	35.17	-2.43	36.04	-2.67	**-2.05**	**2.29**
34	59.10	3.03	43.99	2.44	38.82	1.44	38.41	1.24	39.12	1.53	40.11	1.40	**1.84**	**2.15**
35	54.16	-1.90	41.39	-0.16	36.84	-0.54	37.75	0.58	38.57	0.98	38.54	-0.17	**-0.20**	**1.02**
36	57.17	1.10	41.88	0.33	36.18	-1.20	37.90	0.73	38.00	0.40	37.72	-0.99	**0.06**	**0.94**
37	58.49	2.42	41.90	0.35	36.66	-0.72	36.29	-0.88	37.17	-0.43	38.35	-0.36	**0.06**	**1.23**
38	58.43	2.36	44.68	3.13	39.62	2.24	38.83	1.66	37.88	0.29	41.79	3.08	**2.13**	**2.56**
40	57.63	1.56	42.33	0.78	38.36	0.98	38.42	1.25	38.27	0.68	39.05	0.34	**0.93**	**1.11**
113	56.58	0.51	38.92	-2.63	37.06	-0.32	34.34	-2.84	36.64	-0.95	37.72	-0.99	**-1.20**	**1.86**
137	58.35	2.28	41.55	-0.00	36.55	-0.84	36.21	-0.96	36.93	-0.66	38.17	-0.54	**-0.12**	**1.23**

[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*

VDLUFA

15.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	141	145	144	
p_1	35	35	35	34	35	35	
m	56.07	41.55	37.38	37.17	37.59	38.71	
s_r	0.78	0.69	0.81	0.72	0.80	0.86	
CV_r	1.39	1.66	2.16	1.95	2.13	2.22	
r	2.20	1.95	2.29	2.05	2.27	2.44	
s_R	1.74	1.72	1.86	1.76	1.74	1.71	1.75
CV_R	3.11	4.13	4.98	4.74	4.63	4.43	
R	4.93	4.86	5.27	4.99	4.93	4.85	4.95
HORRAT[1]	1.43	1.81	2.15	2.04	2.00	1.92	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

NDF

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.

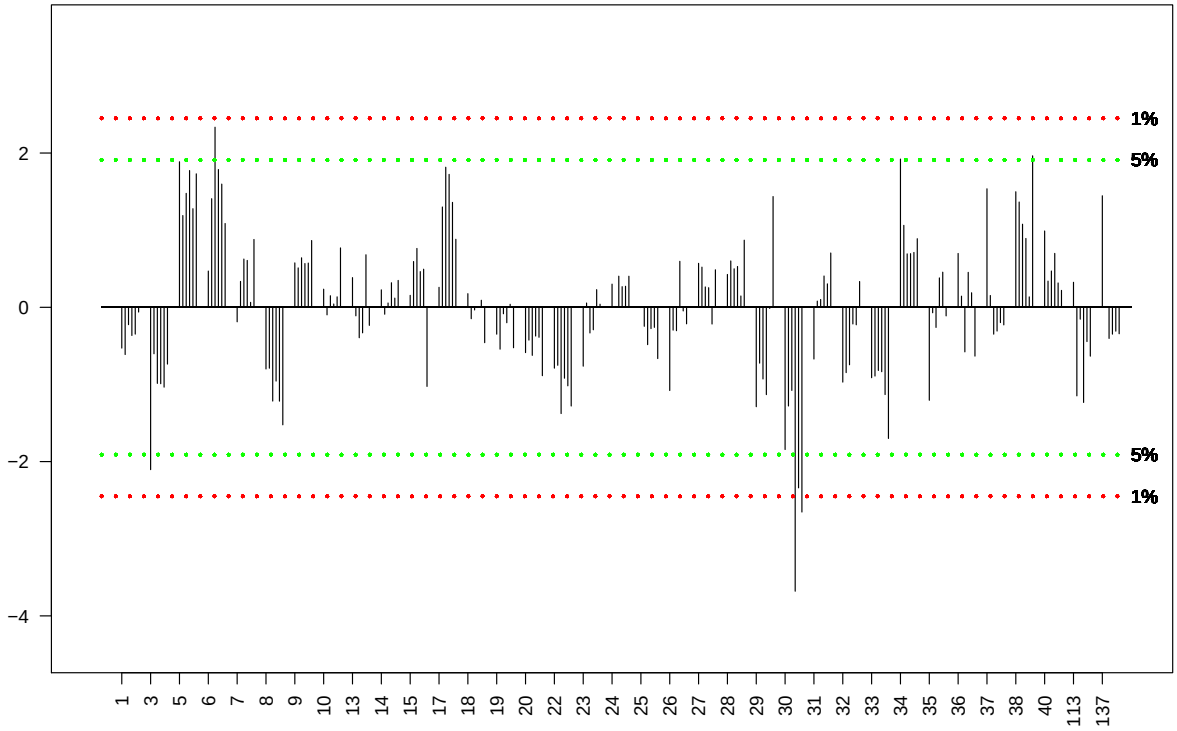
In the following table each lab is marked which was flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	2001	2002	2003	2004	2005	2006
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23			C			
24						
25						
26			c			
27						
28						
29						
30				B	b	
31						
32						
33						
34		C		c	C	
35						
36						
37						
38		C			C	c
40						
113						
137						

VDLUFA

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.

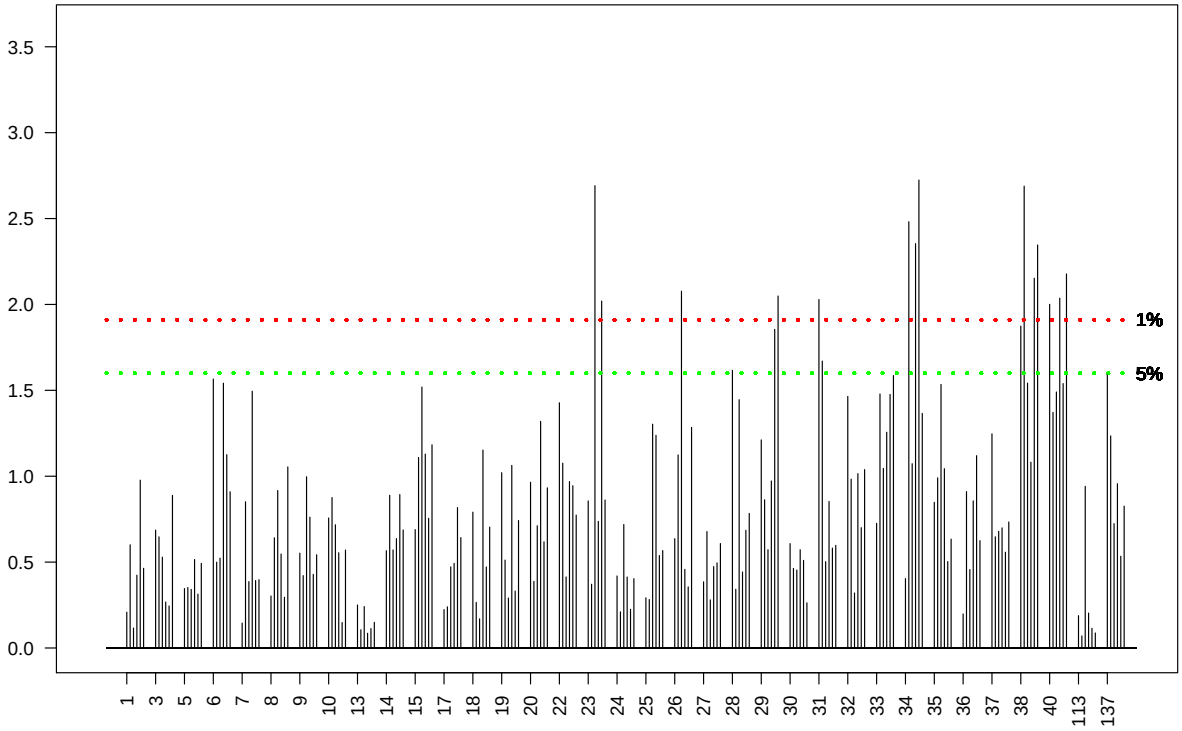
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA

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.

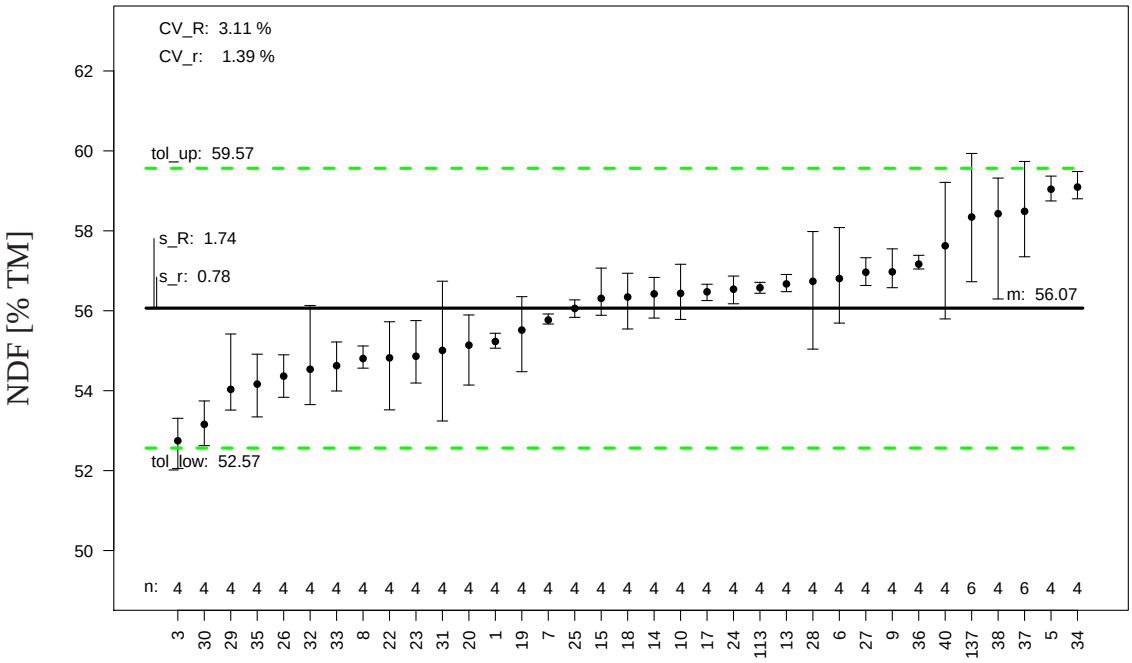
VDLUFA

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 2001:



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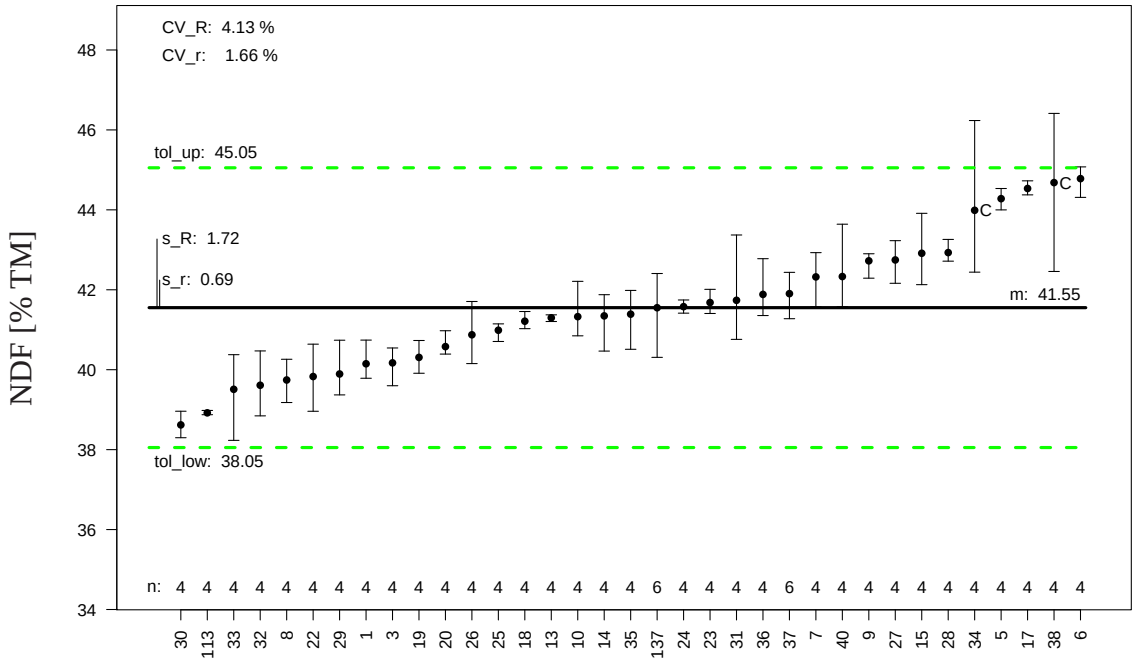
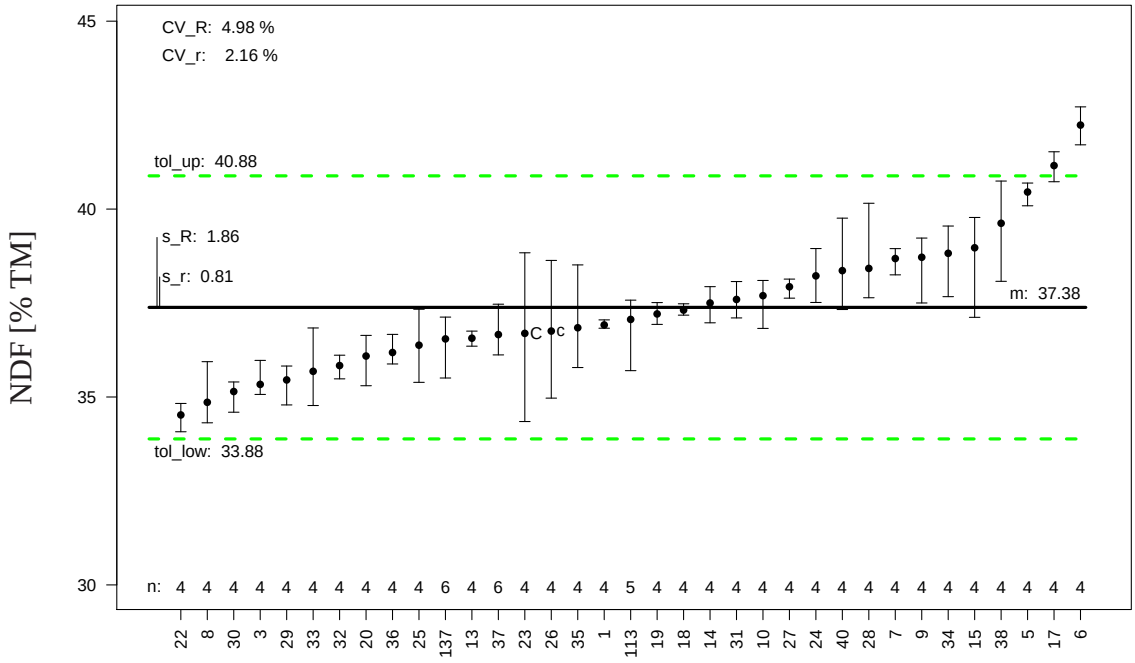
Probe/Sample 2002:



Probe/Sample 2003:



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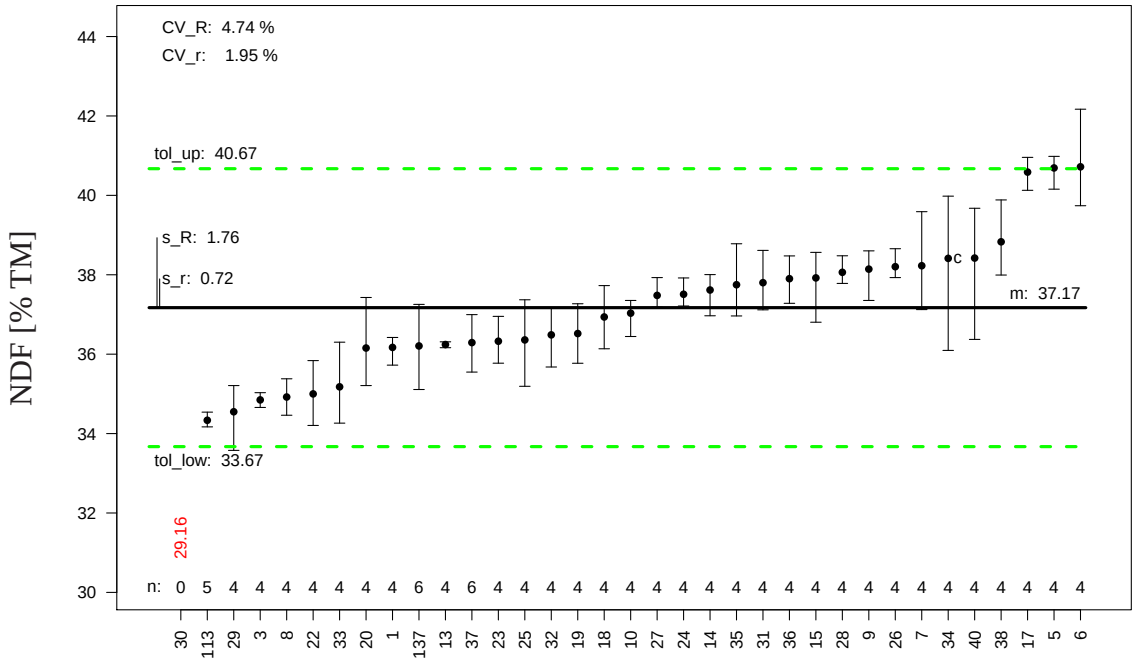
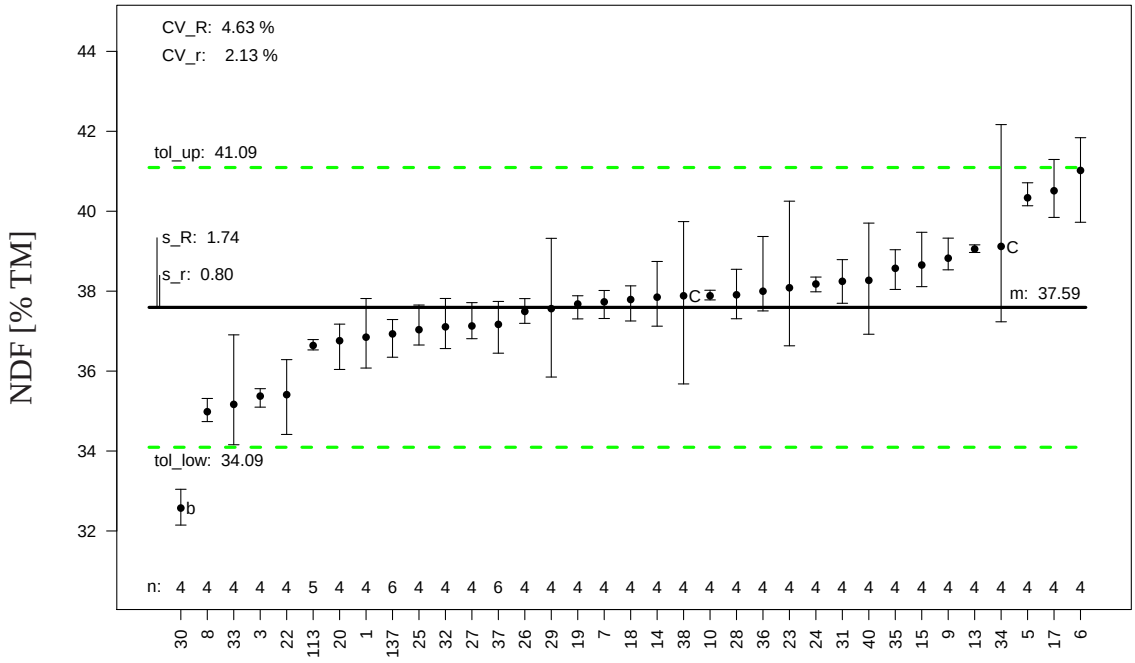
Probe/Sample 2004:

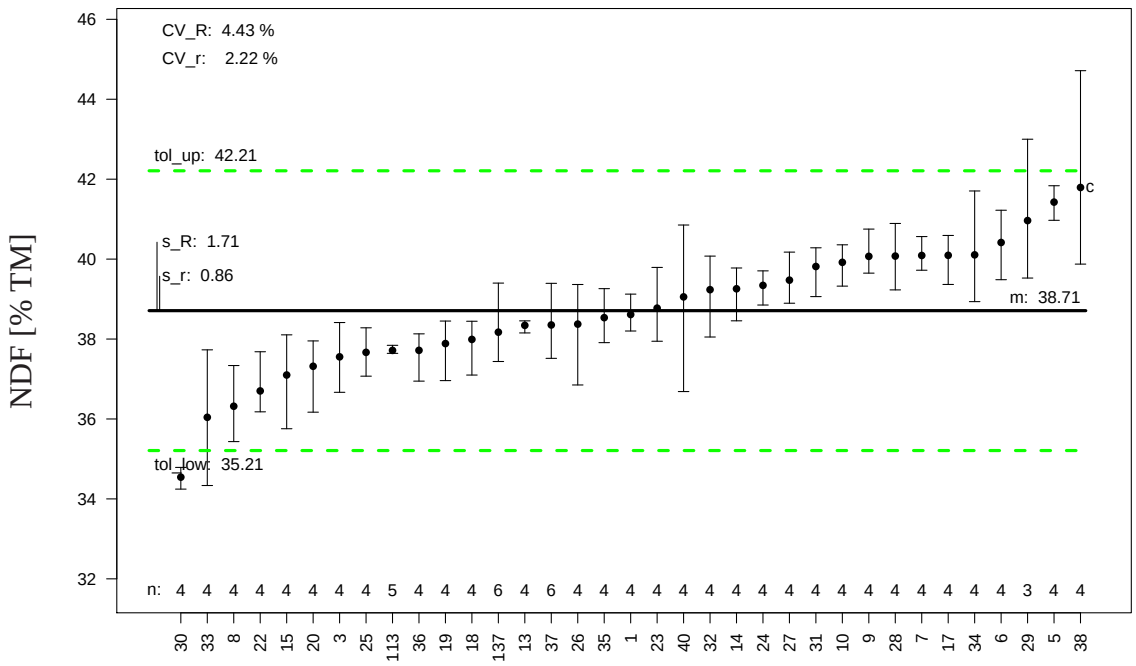


Probe/Sample 2005:



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Probe/Sample 2006:



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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.

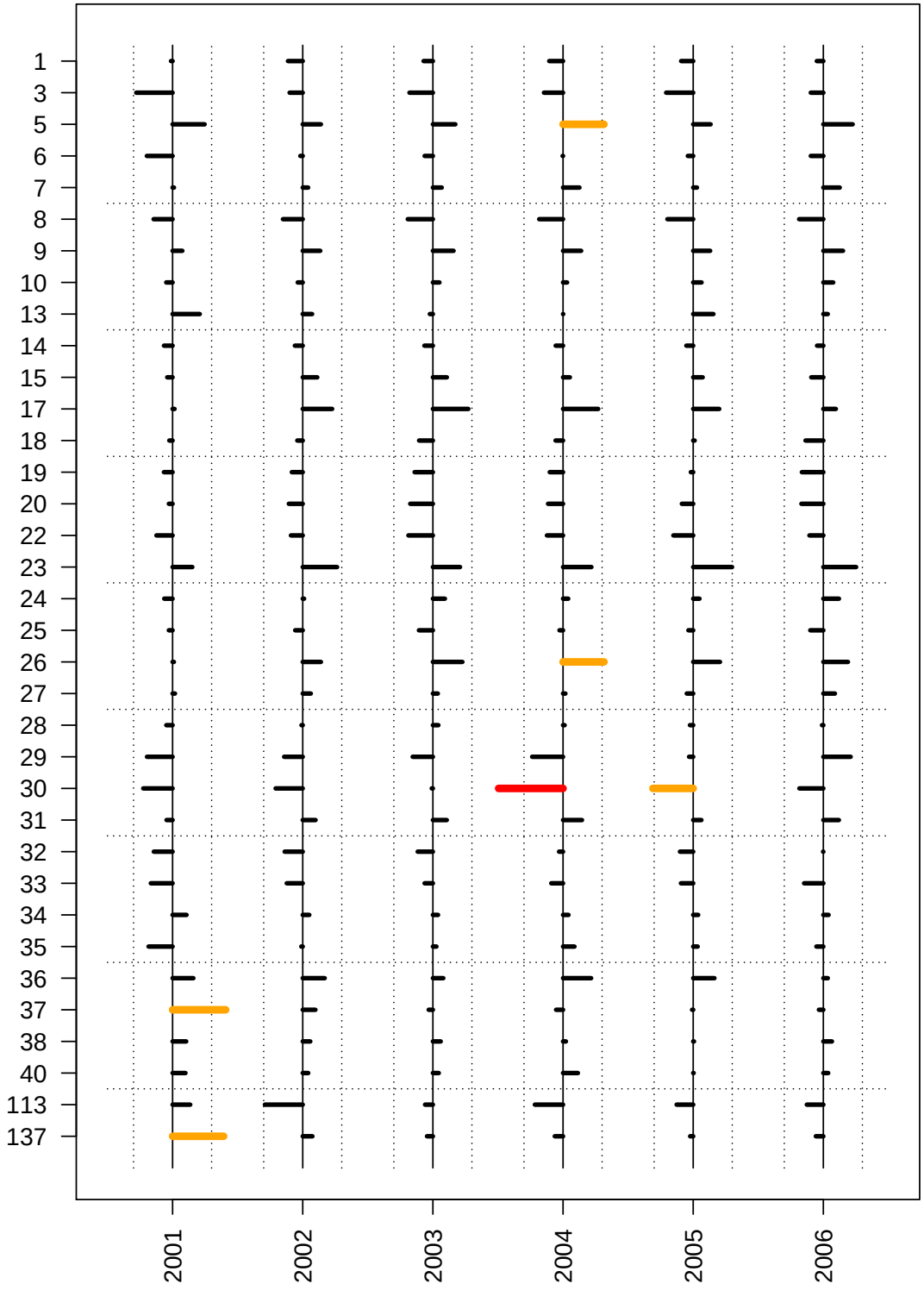
Vergleichsstandardabweichung / Reproducibility standard deviation s_R: 1.1 % TM

Quelle / Source: VDLUFA ASR

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

ADFom

z-Werte / z Scores



VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	34.29	-0.09	22.21	-0.83	19.52	-0.52	19.16	-0.78	19.67	-0.68	20.54	-0.37	**-0.54**	**0.66**
3	32.33	-2.05	22.30	-0.74	18.73	-1.32	18.86	-1.08	18.82	-1.52	20.20	-0.71	**-1.24**	**1.45**
5	36.18	1.81	24.06	1.02	21.31	1.27	22.24	2.31	21.33	0.98	22.56	1.65	**1.51**	**1.73**
6	32.92	-1.45	22.90	-0.14	19.58	-0.47	19.91	-0.02	20.04	-0.30	20.20	-0.71	**-0.51**	**0.77**
7	34.45	0.08	23.34	0.30	20.54	0.50	20.86	0.92	20.56	0.21	21.83	0.92	**0.49**	**0.65**
8	33.30	-1.07	21.92	-1.12	18.63	-1.42	18.59	-1.34	18.89	-1.45	19.54	-1.37	**-1.29**	**1.43**
9	34.92	0.55	24.03	0.99	21.21	1.16	20.96	1.02	21.30	0.96	22.02	1.11	**0.96**	**1.08**
10	34.02	-0.36	22.76	-0.28	20.41	0.37	20.16	0.23	20.82	0.47	21.46	0.56	**0.16**	**0.43**
13	35.91	1.53	23.57	0.53	19.87	-0.17	19.95	0.01	21.49	1.14	21.16	0.25	**0.55**	**0.90**
14	33.89	-0.49	22.60	-0.44	19.57	-0.48	19.52	-0.41	19.96	-0.38	20.55	-0.35	**-0.43**	**0.47**
15	34.07	-0.30	23.86	0.82	20.83	0.78	20.32	0.38	20.88	0.53	20.23	-0.68	**0.26**	**0.67**
17	34.48	0.11	24.70	1.66	22.04	2.00	21.92	1.98	21.81	1.47	21.61	0.70	**1.32**	**1.63**
18	34.19	-0.18	22.73	-0.31	19.27	-0.78	19.52	-0.42	20.43	0.08	19.90	-1.01	**-0.44**	**0.62**
19	33.88	-0.49	22.43	-0.62	19.01	-1.03	19.19	-0.75	20.21	-0.13	19.70	-1.21	**-0.70**	**0.86**
20	34.16	-0.21	22.26	-0.78	18.77	-1.28	19.09	-0.84	19.71	-0.64	19.67	-1.24	**-0.83**	**0.99**
22	33.46	-0.91	22.38	-0.66	18.67	-1.38	19.03	-0.91	19.23	-1.12	20.12	-0.78	**-0.96**	**1.08**
23	35.49	1.11	24.97	1.93	21.57	1.53	21.54	1.60	22.54	2.19	22.75	1.85	**1.70**	**1.90**
24	33.90	-0.47	23.12	0.08	20.72	0.68	20.23	0.29	20.70	0.35	21.79	0.88	**0.30**	**0.58**
25	34.16	-0.21	22.62	-0.42	19.26	-0.79	19.74	-0.20	20.08	-0.27	20.17	-0.74	**-0.44**	**0.55**
26	34.45	0.07	24.06	1.02	21.71	1.66	22.25	2.31	21.86	1.51	22.29	1.39	**1.33**	**1.63**
27	34.51	0.13	23.49	0.45	20.32	0.28	20.07	0.13	19.98	-0.36	21.56	0.65	**0.21**	**0.42**
28	34.02	-0.35	22.97	-0.07	20.35	0.31	20.03	0.09	20.16	-0.18	20.83	-0.07	**-0.05**	**0.23**
29	32.93	-1.44	21.99	-1.05	18.90	-1.14	18.20	-1.74	20.11	-0.23	22.45	1.54	**-0.68**	**1.41**
30	32.72	-1.65	21.51	-1.53	19.98	-0.06	15.90	-4.04	18.08	-2.27	19.56	-1.35	**-1.82**	**2.38**
31	34.04	-0.34	23.76	0.72	20.83	0.78	21.00	1.07	20.81	0.46	21.78	0.87	**0.59**	**0.82**
32	33.31	-1.06	22.02	-1.02	19.19	-0.86	19.71	-0.22	19.60	-0.75	20.89	-0.01	**-0.65**	**0.84**
33	33.15	-1.23	22.14	-0.90	19.58	-0.47	19.27	-0.66	19.66	-0.69	19.82	-1.08	**-0.84**	**0.96**
34	35.16	0.79	23.41	0.37	20.33	0.29	20.24	0.31	20.63	0.28	21.20	0.30	**0.39**	**0.47**
35	33.02	-1.35	22.96	-0.08	20.24	0.20	20.58	0.64	20.60	0.25	20.52	-0.39	**-0.12**	**0.71**
36	35.55	1.17	24.28	1.24	20.63	0.59	21.52	1.58	21.54	1.20	21.16	0.25	**1.00**	**1.20**
37	37.36	2.99	23.75	0.71	19.81	-0.24	19.55	-0.39	20.29	-0.06	20.66	-0.25	**0.46**	**1.39**
38	35.14	0.77	23.47	0.43	20.48	0.44	20.10	0.16	20.39	0.04	21.39	0.49	**0.39**	**0.50**
40	35.10	0.72	23.35	0.31	20.38	0.33	20.77	0.84	20.37	0.03	21.18	0.27	**0.42**	**0.55**
113	35.37	0.99	20.91	-2.13	19.60	-0.44	18.35	-1.59	19.41	-0.93	19.98	-0.93	**-0.84**	**1.41**
137	37.25	2.88	23.59	0.55	19.71	-0.33	19.47	-0.47	20.17	-0.17	20.48	-0.42	**0.34**	**1.35**

[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*

VDLUFA

16.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	145	145	144	
p_1	35	35	35	35	35	35	
m	34.37	23.04	20.04	19.94	20.35	20.91	
s_r	0.58	0.42	0.47	0.42	0.44	0.55	
CV_r	1.67	1.83	2.34	2.12	2.17	2.61	
r	1.63	1.19	1.33	1.19	1.25	1.55	
s_R	1.36	0.98	0.98	1.29	0.99	1.02	1.10
CV_R	3.96	4.25	4.90	6.47	4.87	4.88	
R	3.85	2.77	2.78	3.65	2.80	2.89	3.11
HORRAT[1]	1.69	1.70	1.92	2.54	1.92	1.93	

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

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

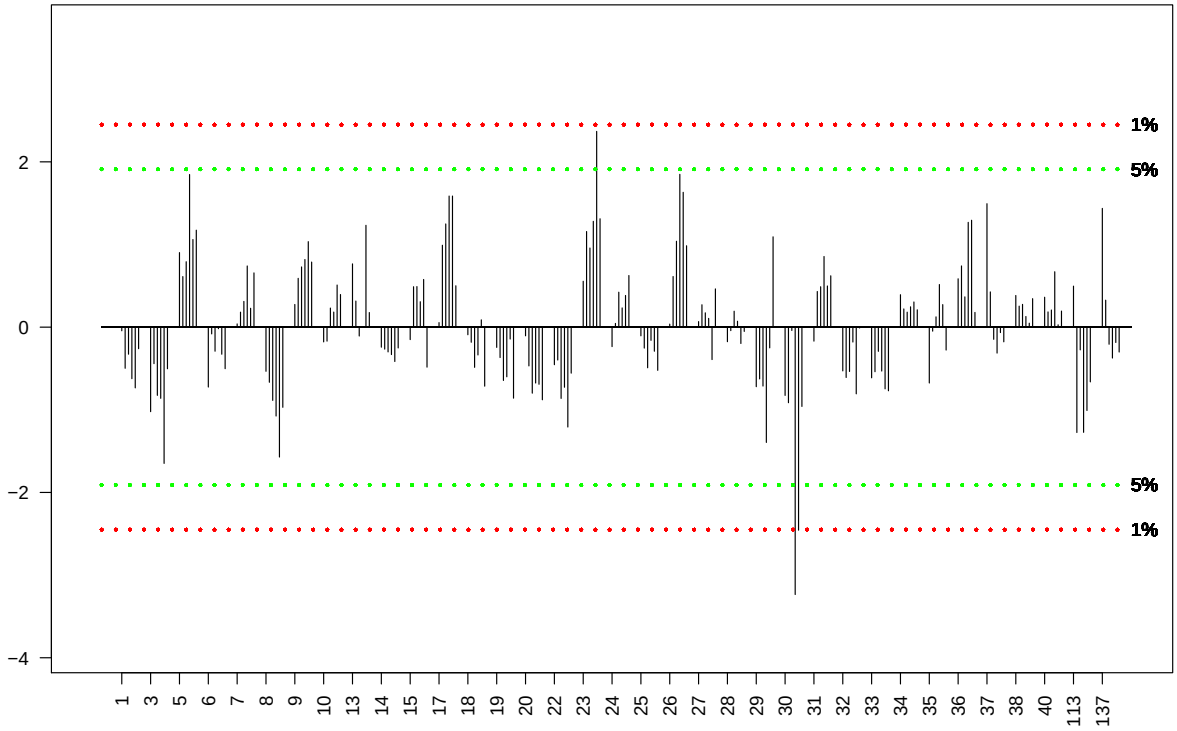
In the following table each lab is marked which was flaged as an outlier for a sample.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23			C		c	
24						
25						
26			C			
27						
28						
29						C
30				b		
31	C	C				
32						
33						
34						
35						
36						
37						
38						
40	C					
113						
137						

VDLUFA

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.

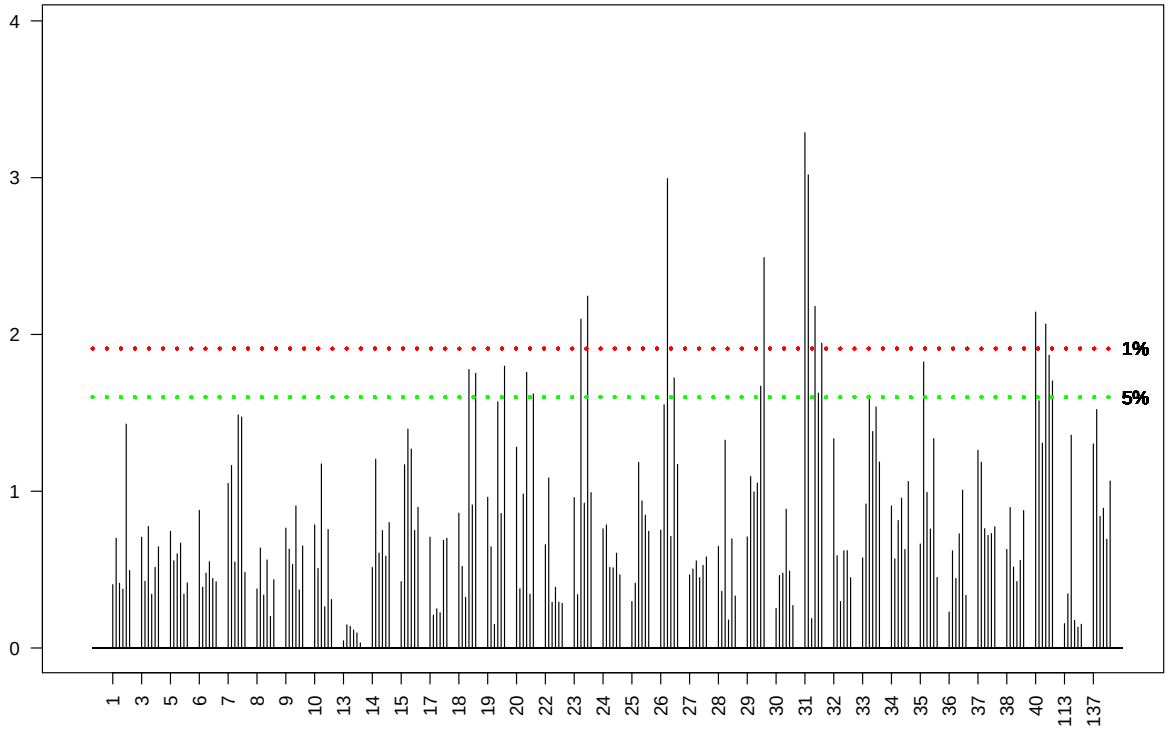
Upper and lower lines 1% significance level, intermediate lines 5% significance level.

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.

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

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.

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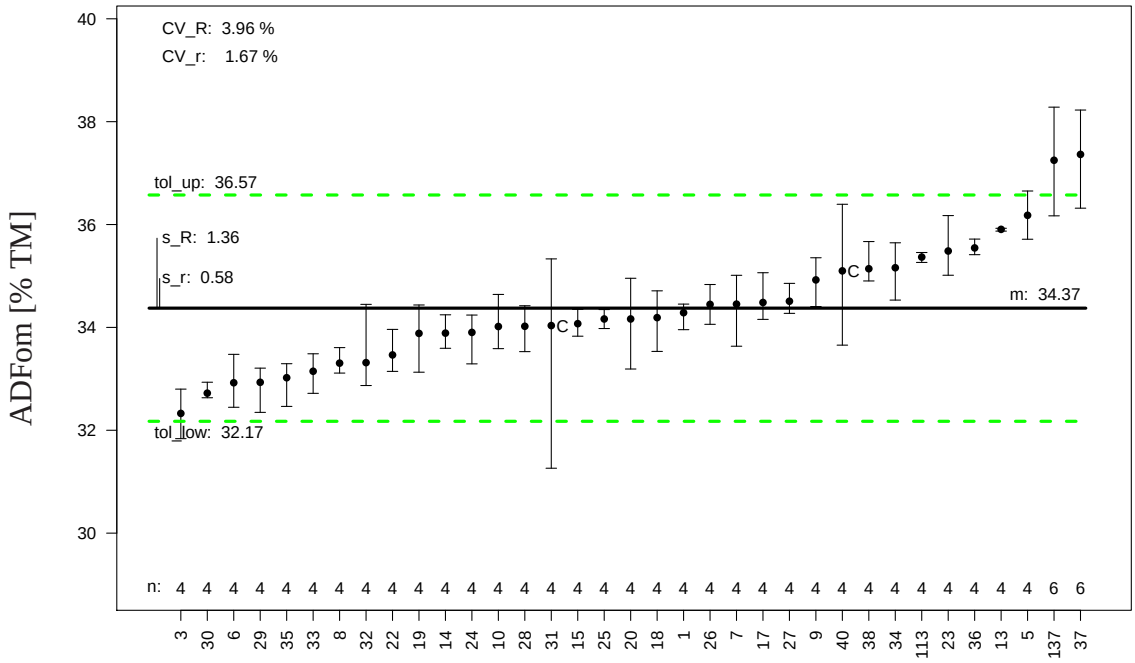
16.4 Einzelproben / Single Samples

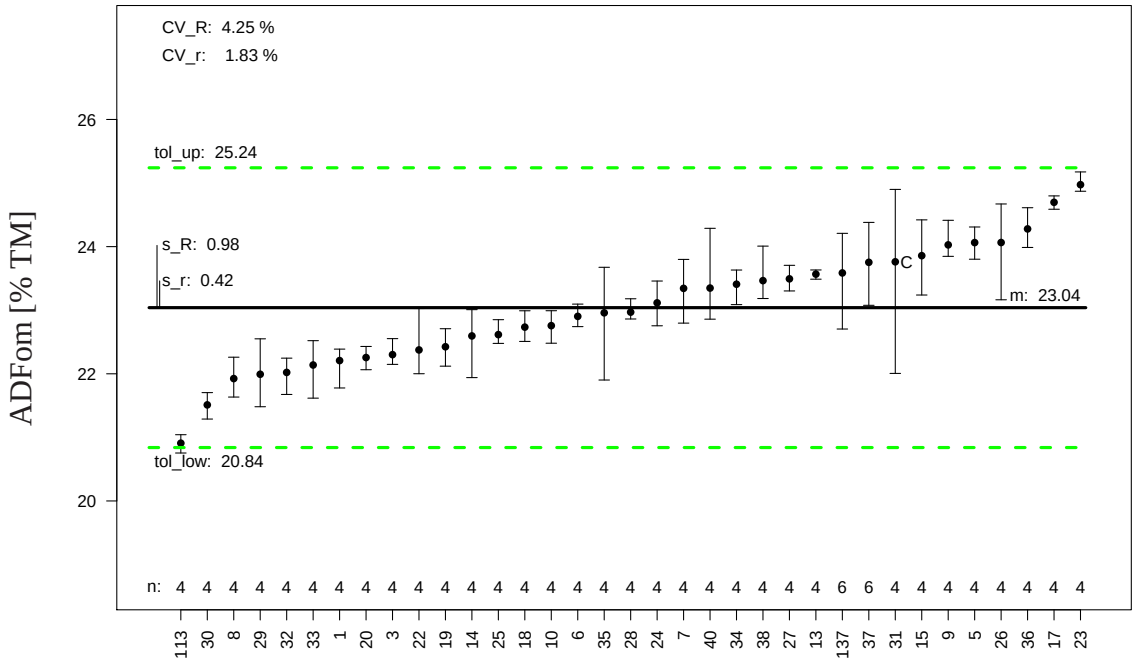
Die durchgezogene, waagerechte Linie kennzeichnet den Mittelwert der Analysen aus diesem Ringversuch. Die gestrichelten Linien - falls vorhanden - markieren den "wahren Wert". Die grünen, gestrichelten Linien markieren die mit der Vergleichsstandardabweichung der Methode nach Norm - falls vorhanden -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

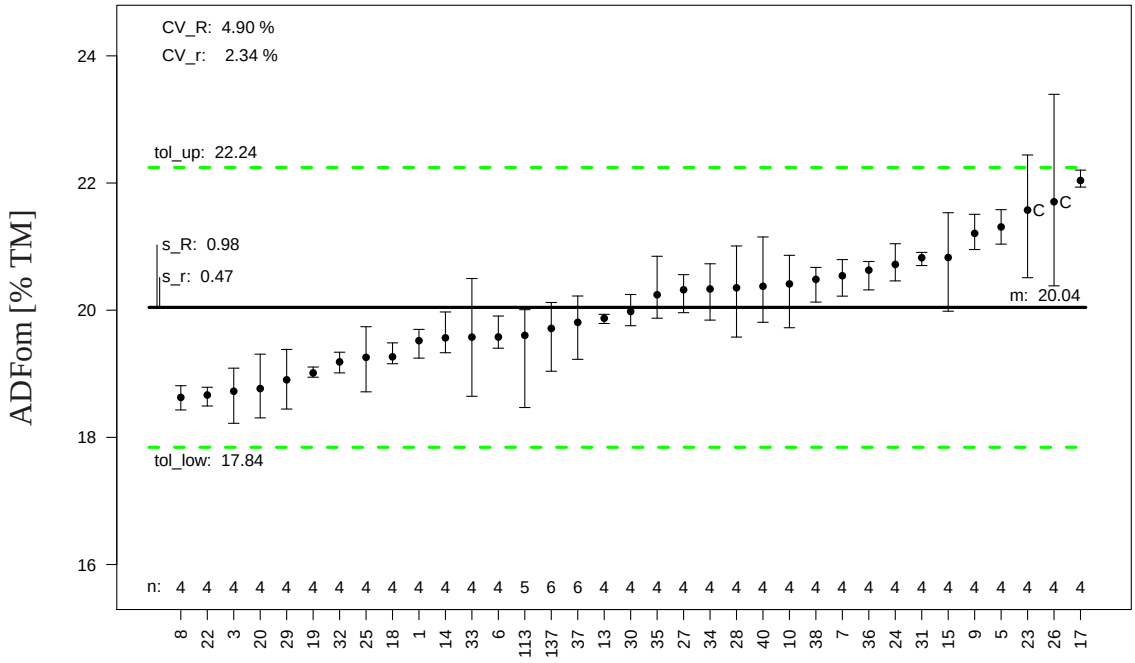
Probe/Sample 2001:



Probe/Sample 2002:



Probe/Sample 2003:



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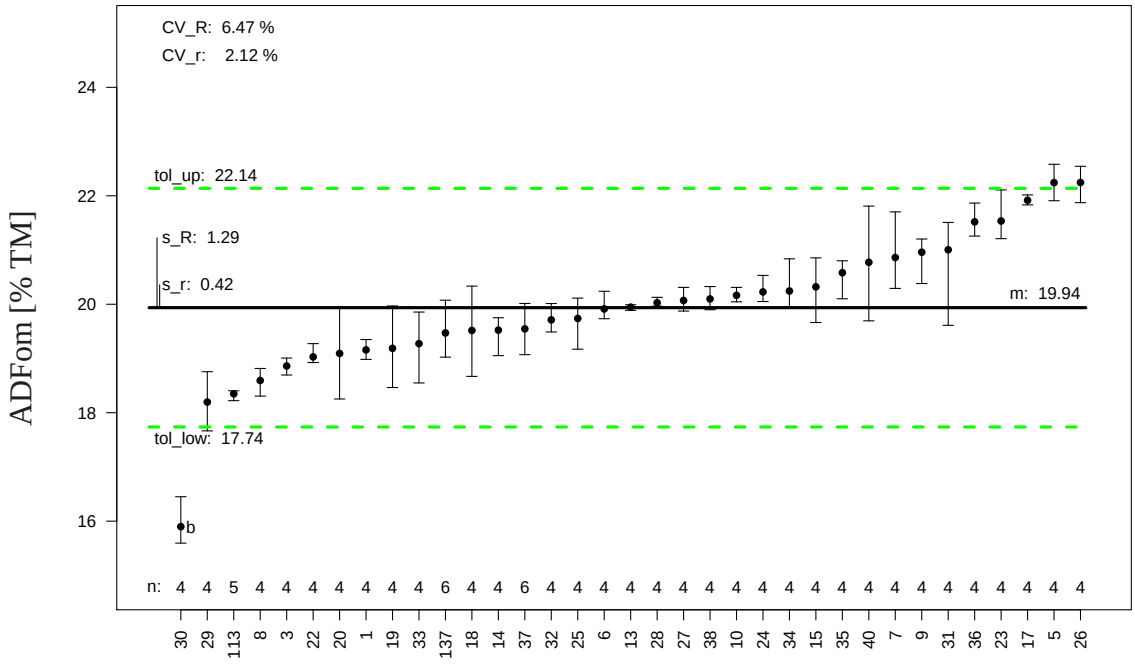
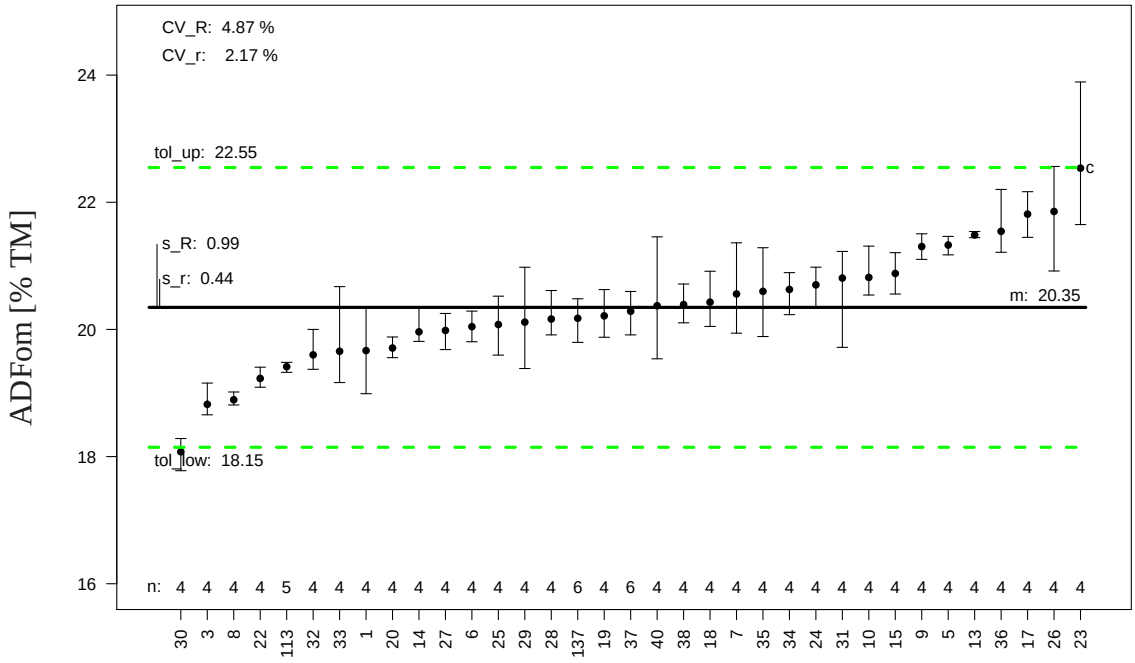
Probe/Sample 2004:



Probe/Sample 2005:



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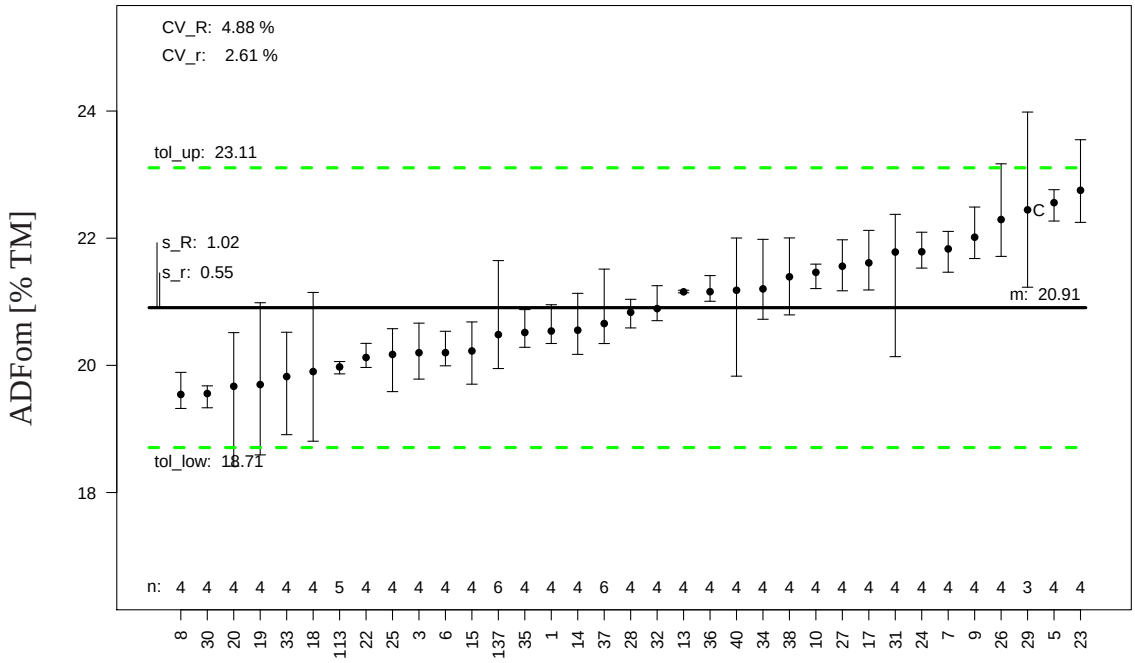
Probe/Sample 2006:



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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

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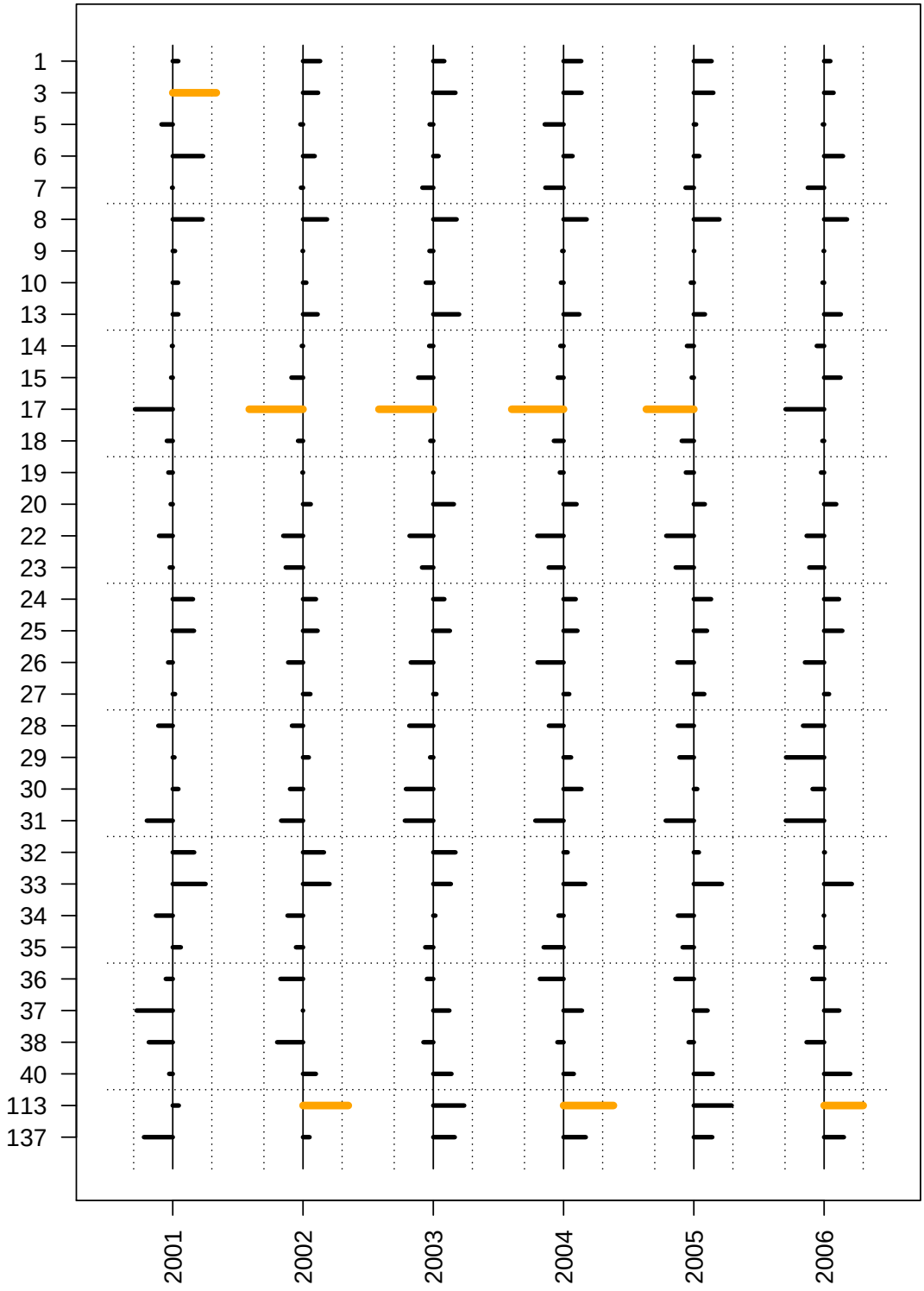
Elos / Cellulase

z-Werte / z Scores



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Die senkrechten, gestrichelten Linien markieren einen z-Wert von -2 bzw. 2. Die waagerechten, gestrichelten Linien sind Hilfslinien zur 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.

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Systematische Labordifferenz / lab bias

Probe/Sample	2001		2002		2003		2004		2005		2006		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	53.94	0.50	70.09	1.53	73.10	0.98	74.32	1.58	74.17	1.59	73.05	0.56	**1.12**	**1.33**
3	57.35	3.90	69.91	1.35	74.10	1.98	74.35	1.62	74.33	1.74	73.34	0.85	**1.91**	**2.34**
5	52.44	-1.01	68.32	-0.24	71.79	-0.33	71.05	-1.69	72.79	0.20	72.38	-0.11	**-0.53**	**0.90**
6	56.17	2.72	69.60	1.04	72.59	0.47	73.54	0.81	73.07	0.49	74.18	1.69	**1.20**	**1.58**
7	53.39	-0.06	68.37	-0.18	71.14	-0.98	71.10	-1.63	71.84	-0.74	71.03	-1.46	**-0.84**	**1.12**
8	56.12	2.68	70.70	2.14	74.20	2.09	74.80	2.06	74.88	2.29	74.53	2.04	**2.22**	**2.44**
9	53.65	0.20	68.52	-0.04	71.78	-0.34	72.62	-0.12	72.62	0.03	72.44	-0.04	**-0.05**	**0.19**
10	53.92	0.48	68.85	0.29	71.45	-0.67	72.50	-0.23	72.31	-0.27	72.35	-0.14	**-0.09**	**0.43**
13	53.95	0.50	69.87	1.31	74.43	2.31	74.14	1.41	73.57	0.99	73.98	1.49	**1.34**	**1.58**
14	53.38	-0.07	68.45	-0.11	71.75	-0.37	72.45	-0.28	71.97	-0.61	71.83	-0.66	**-0.35**	**0.46**
15	53.30	-0.14	67.53	-1.03	70.77	-1.35	72.21	-0.52	72.39	-0.19	73.96	1.47	**-0.29**	**1.04**
17	50.07	-3.37	63.74	-4.82	67.25	-4.87	68.09	-4.64	68.33	-4.25	69.04	-3.45	**-4.23**	**4.69**
18	52.92	-0.53	68.12	-0.44	71.85	-0.26	71.87	-0.87	71.50	-1.08	72.34	-0.15	**-0.56**	**0.71**
19	53.06	-0.39	68.51	-0.05	72.11	-0.00	72.40	-0.33	71.87	-0.71	72.21	-0.28	**-0.29**	**0.41**
20	53.26	-0.18	69.25	0.69	73.96	1.84	73.90	1.16	73.56	0.98	73.57	1.08	**0.93**	**1.22**
22	52.22	-1.23	66.79	-1.77	69.99	-2.12	70.38	-2.35	70.12	-2.47	70.93	-1.56	**-1.92**	**2.15**
23	53.18	-0.27	67.01	-1.55	71.11	-1.01	71.41	-1.33	70.96	-1.62	71.17	-1.32	**-1.18**	**1.39**
24	55.26	1.81	69.71	1.16	73.11	0.99	73.82	1.08	74.12	1.54	73.82	1.33	**1.32**	**1.48**
25	55.35	1.90	69.86	1.31	73.60	1.48	73.98	1.24	73.76	1.18	74.12	1.63	**1.46**	**1.62**
26	53.03	-0.41	67.23	-1.33	70.10	-2.02	70.41	-2.33	71.11	-1.47	70.77	-1.72	**-1.55**	**1.82**
27	53.65	0.21	69.22	0.66	72.40	0.28	73.24	0.51	73.52	0.93	72.93	0.44	**0.50**	**0.61**
28	52.16	-1.29	67.57	-0.99	69.97	-2.15	71.42	-1.31	71.16	-1.43	70.61	-1.88	**-1.51**	**1.71**
29	53.60	0.15	69.07	0.52	71.84	-0.28	73.41	0.67	71.30	-1.28	69.08	-3.41	**-0.61**	**1.68**
30	53.95	0.50	67.40	-1.16	69.67	-2.45	74.34	1.60	72.89	0.31	71.46	-1.03	**-0.37**	**1.51**
31	51.13	-2.32	66.60	-1.96	69.57	-2.54	70.21	-2.53	70.07	-2.52	69.06	-3.43	**-2.55**	**2.83**
32	55.36	1.92	70.43	1.87	74.10	1.98	73.10	0.36	73.03	0.45	72.56	0.07	**1.11**	**1.51**
33	56.39	2.94	70.93	2.37	73.69	1.57	74.67	1.94	75.10	2.52	74.97	2.48	**2.30**	**2.57**
34	51.95	-1.50	67.18	-1.38	72.30	0.18	72.28	-0.45	71.16	-1.42	72.46	-0.03	**-0.77**	**1.13**
35	54.17	0.72	67.93	-0.63	71.40	-0.72	70.95	-1.78	71.58	-1.00	71.68	-0.81	**-0.70**	**1.12**
36	52.83	-0.62	66.54	-2.02	71.55	-0.57	70.61	-2.12	70.93	-1.65	71.44	-1.05	**-1.34**	**1.62**
37	50.21	-3.24	68.55	-0.01	73.56	1.44	74.38	1.65	73.81	1.23	73.84	1.36	**0.40**	**1.93**
38	51.30	-2.14	66.25	-2.31	71.24	-0.88	72.19	-0.55	72.12	-0.47	70.92	-1.57	**-1.32**	**1.65**
40	53.13	-0.32	69.71	1.15	73.74	1.63	73.65	0.92	74.28	1.70	74.82	2.33	**1.23**	**1.63**
113	53.99	0.54	72.62	4.06	74.88	2.76	77.20	4.47	75.97	3.39	75.99	3.50	**3.12**	**3.69**
137	50.87	-2.58	69.14	0.58	74.04	1.92	74.72	1.98	74.23	1.65	74.26	1.77	**0.89**	**2.02**

[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*

VDLUFA

17.3 Methodenbeschreibung / Method Description

In Anlehnung an / *according to :* ISO 5725

Probe/Sample	2001	2002	2003	2004	2005	2006	VDLUFA ASR
n	144	144	145	145	145	144	
p	35	35	35	35	35	35	
n_1	144	144	145	145	145	144	
p_1	35	35	35	35	35	35	
m	53.45	68.56	72.12	72.73	72.58	72.49	
s_r	0.67	0.57	0.63	0.57	0.62	0.80	
CV_r	1.25	0.83	0.87	0.79	0.85	1.10	
r	1.90	1.61	1.77	1.62	1.75	2.26	
s_R	1.83	1.71	1.81	1.89	1.73	1.86	1.75
CV_R	3.43	2.49	2.51	2.59	2.39	2.56	
R	5.19	4.83	5.11	5.34	4.91	5.25	4.95
HORRAT[1]	1.56	1.18	1.19	1.23	1.14	1.22	

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

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Elos / Cellulase

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 flaged as an outlier for a sample.

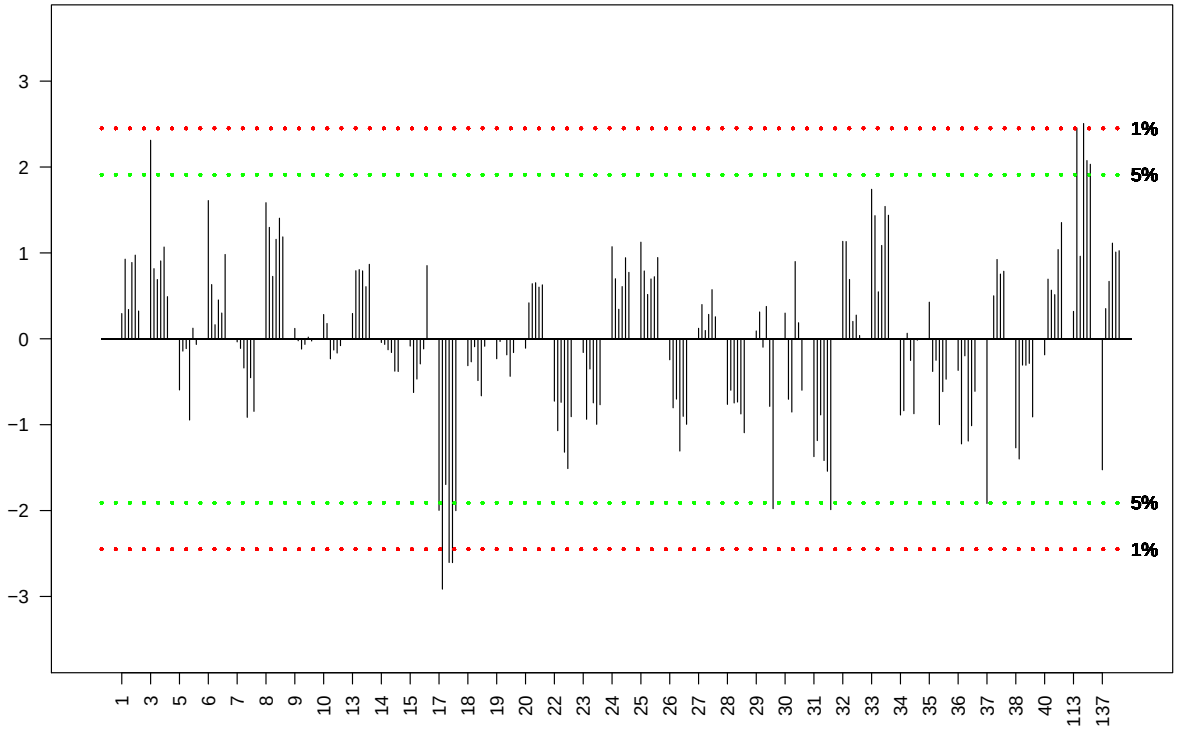
VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Labor	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
1						
3						
5						
6						
7						
8						
9						
10						
13						
14						
15						
17						
18						
19						
20						
22						
23						
24						
25						
26			C			
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
40	c					
113						
137						

VDLUFA VDLUFA VDLUFA VDLUFA VDLUFA

Elos / Cellulase

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.

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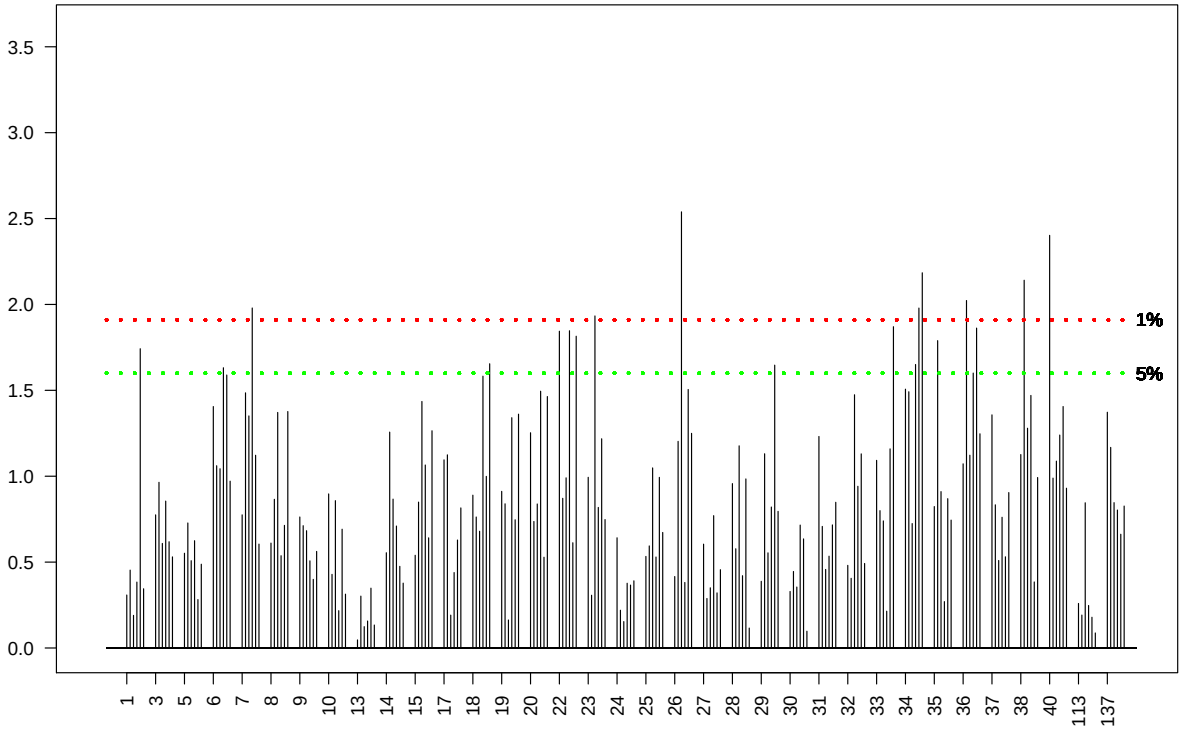
Vergleich der laborinternen Streuung nach Mandels k / Lab internal repeatability comparison Mandel's k



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.

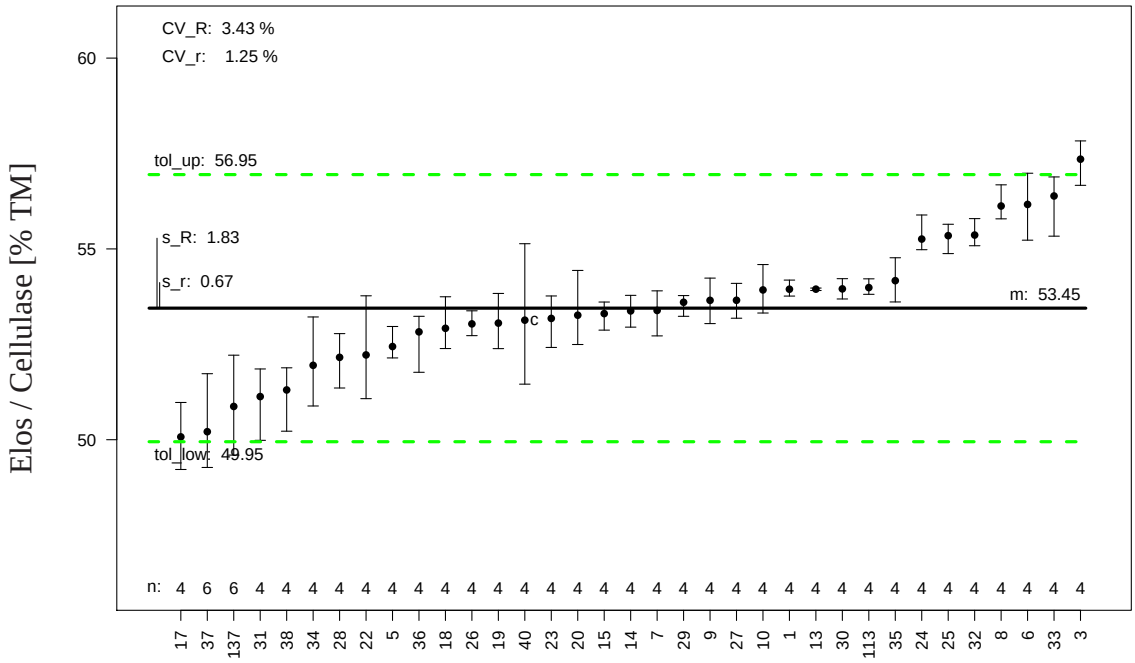
VDLUFA

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 2001:



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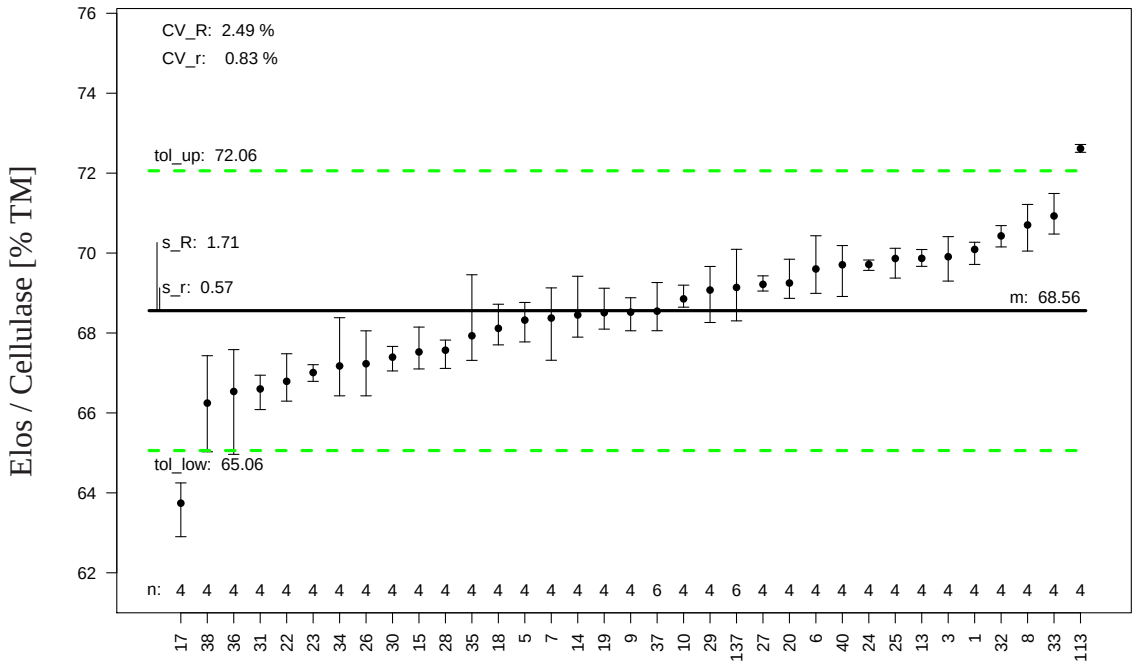
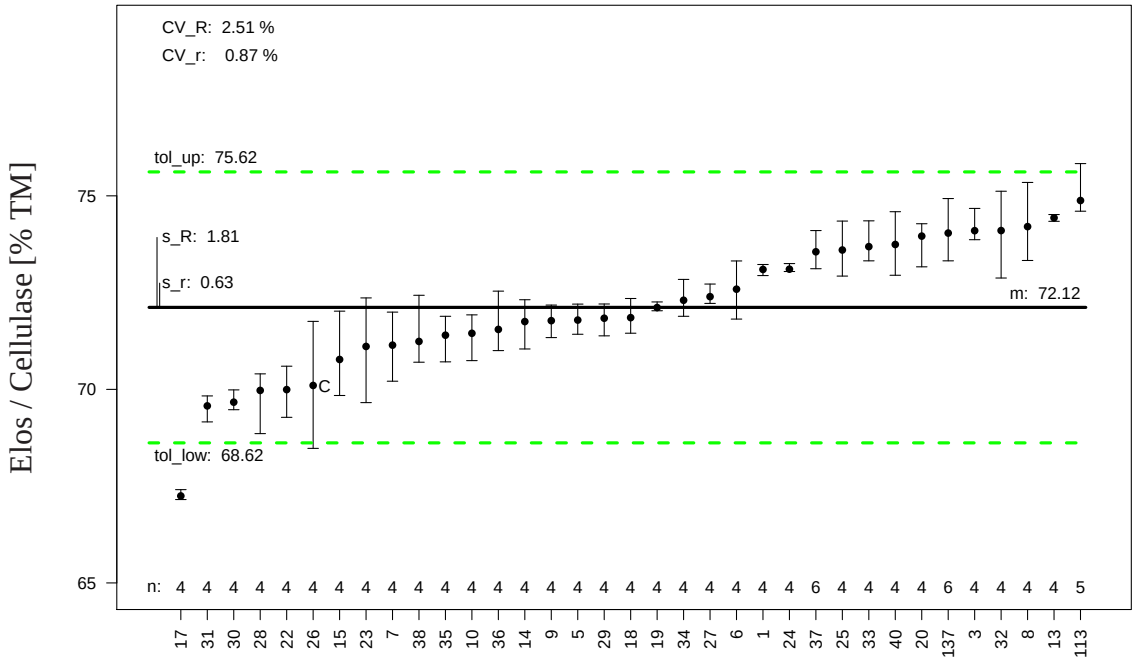
Probe/Sample 2002:



Probe/Sample 2003:



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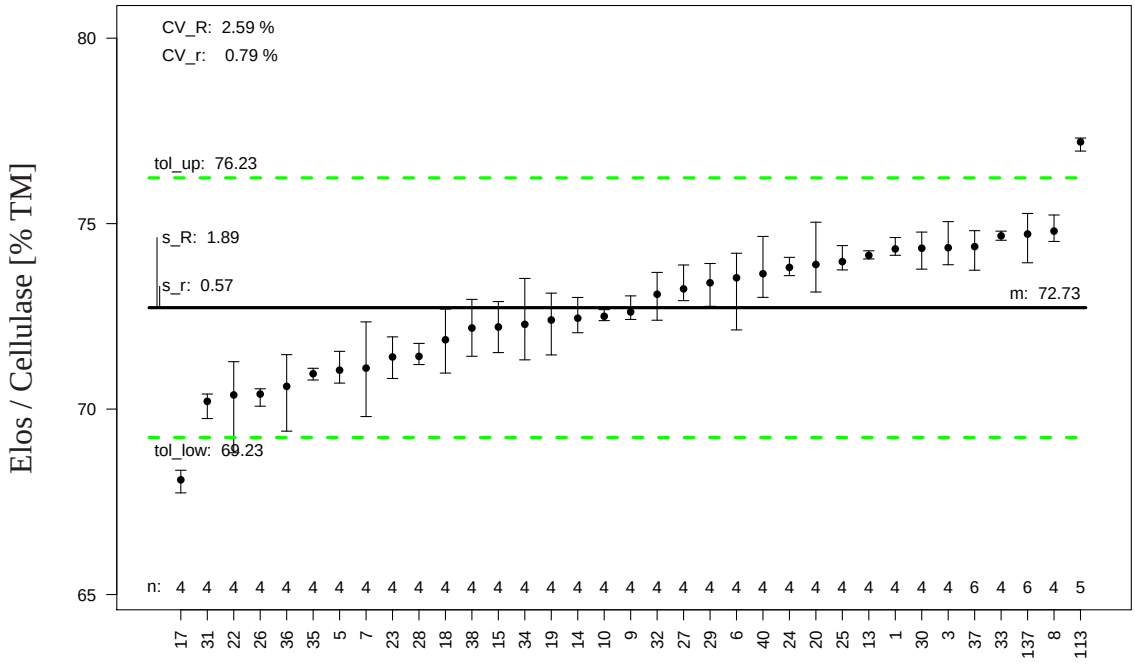
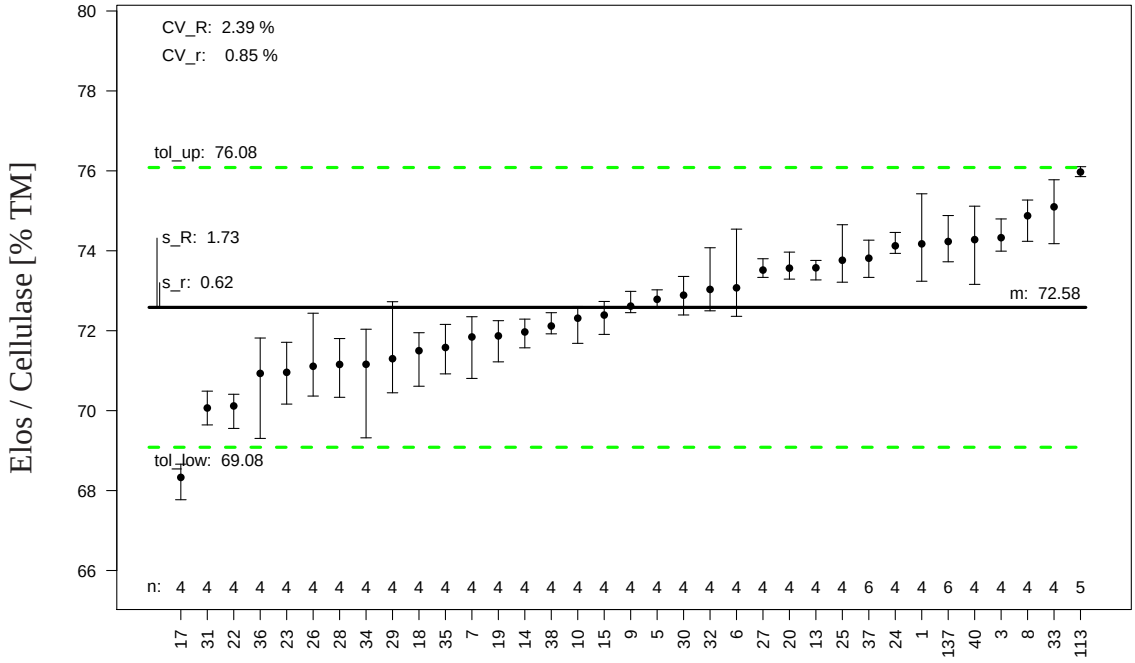
Probe/Sample 2004:



Probe/Sample 2005:



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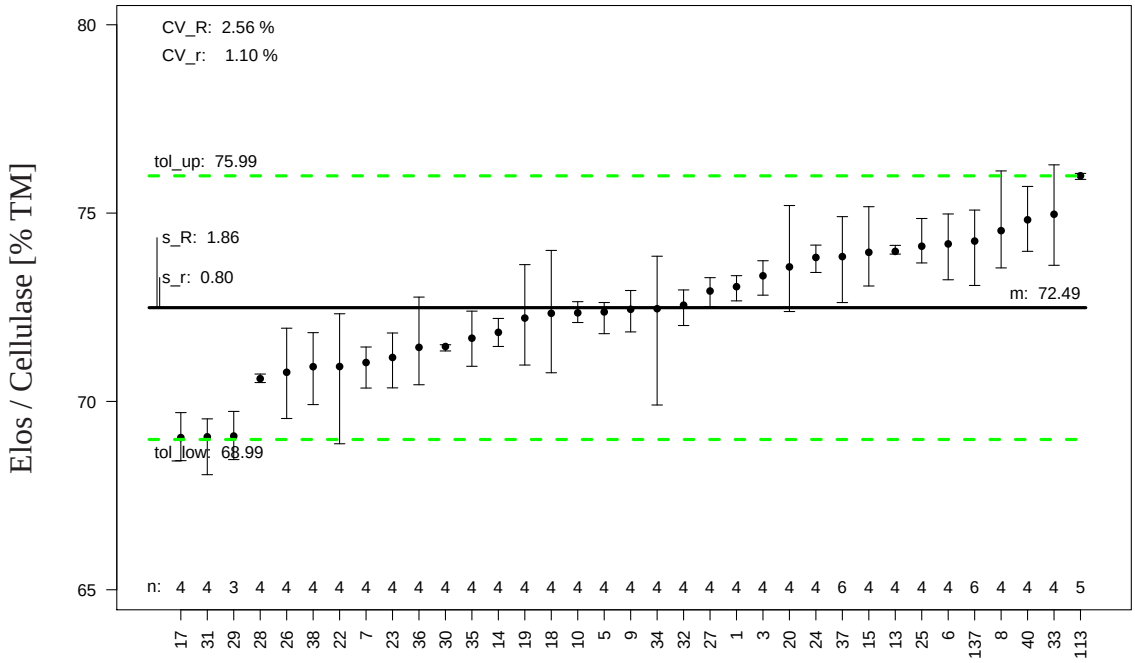
Probe/Sample 2006:



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18 Anhang / Appendix

18.1 Trockenmasse / dry matter

18.1.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	0.57	0.51	0.30	0.58	0.63	0.13
3	1.40	2.06	1.55	1.61	1.76	1.42
5	-0.33	-0.37	0.04	0.12	0.23	0.07
6	0.20	0.26	0.11	0.30	-0.20	-0.24
7	-0.16	-0.10	-0.22	-0.02	-0.16	-0.01
8	-0.89	-0.85	-0.71	-0.91	-0.84	-0.59
9	0.63	0.78	0.89	0.71	1.01	1.16
10	-1.34	-1.45	-1.33	-1.42	-1.23	-1.16
13	2.32	1.51	1.78	1.67	1.22	1.20
14	-0.70	-0.91	-1.01	0.23	-0.38	-0.59
15	-1.12	-0.80	-0.70	-1.11	-0.71	-1.56
17	-0.68	-0.46	-1.16	-1.08	-1.51	-1.14
18	-0.72	-0.87	-0.77	-1.02	-1.13	-1.22
19	-0.35	-0.67	-0.74	-1.25	-1.24	-1.23
20	0.08	-0.12	0.44	0.03	-0.07	-0.15
22	0.62	0.62	0.82	1.23	0.91	0.51
23	0.54	0.68	0.66	0.98	1.04	0.74
24	-0.64	-0.68	-0.64	-0.66	-0.91	-0.75
25	0.69	0.87	0.42	0.89	0.99	0.76
26	0.03	-0.25	-0.51	0.38	0.30	0.25
27	0.26	0.34	-0.01	0.13	-0.23	0.02
28	-0.49	-0.66	-0.71	-0.49	-0.52	-0.67
29	1.54	1.91	1.06	1.15	1.26	2.07
30	1.91	1.24	2.06	0.37	1.38	0.58
31	-0.57	-0.59	-0.79	-0.55	-0.36	-0.35
32	-0.35	0.20	0.10	-0.07	0.15	-0.05
33	1.98	1.78	1.41	1.70	1.92	1.61
34	0.01	-0.24	0.13	-0.60	0.02	0.48
35	-1.24	-1.64	-1.91	-1.52	-1.48	-1.36
36	-1.38	-1.60	-1.50	-1.50	-1.36	-1.22
37	-0.56	-0.17	-0.12	0.04	-0.19	-0.29
38	-1.07	-0.77	-0.52	-1.02	-0.38	-0.09
40	0.59	1.03	1.51	1.77	1.49	2.27
113	0.33	0.31	0.70	0.08	-0.54	0.30
137	-1.12	-0.89	-0.65	-0.76	-0.86	-0.93

18.1.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	90.49	0.12	90.41	90.41	90.65	90.47
2002	1	4	90.34	0.12	90.31	90.20	90.48	90.38
2003	1	4	90.59	0.08	90.65	90.63	90.48	90.58
2004	1	4	90.64	0.07	90.61	90.68	90.72	90.57
2005	1	4	90.86	0.11	90.73	90.95	90.81	90.95
2006	1	4	90.46	0.10	90.34	90.40	90.54	90.55
2001	3	4	91.05	0.08	90.98	91.07	91.00	91.15
2002	3	4	91.26	0.12	91.15	91.38	91.16	91.34
2003	3	4	91.45	0.19	91.36	91.73	91.37	91.34

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	91.24	0.09	91.28	91.29	91.10	91.30
2005	3	4	91.54	0.18	91.34	91.76	91.49	91.58
2006	3	4	91.40	0.20	91.48	91.15	91.62	91.33
2001	5	4	89.87	0.10	89.96	89.90	89.88	89.72
2002	5	4	89.82	0.12	89.77	89.98	89.70	89.85
2003	5	4	90.41	0.06	90.34	90.48	90.41	90.40
2004	5	4	90.38	0.11	90.22	90.42	90.47	90.38
2005	5	4	90.62	0.10	90.49	90.60	90.71	90.69
2006	5	4	90.42	0.13	90.57	90.31	90.47	90.31
2001	6	4	90.23	0.20	90.44	90.22	90.30	89.97
2002	6	4	90.19	0.05	90.19	90.12	90.23	90.23
2003	6	4	90.45	0.08	90.39	90.43	90.42	90.58
2004	6	4	90.48	0.16	90.47	90.47	90.69	90.30
2005	6	4	90.37	0.11	90.43	90.21	90.42	90.40
2006	6	4	90.19	0.15	90.29	90.21	90.28	89.97
2001	7	4	89.98	0.30	89.71	89.80	90.38	90.02
2002	7	4	89.98	0.30	89.54	90.03	90.15	90.20
2003	7	4	90.23	0.12	90.12	90.17	90.40	90.20
2004	7	4	90.29	0.22	90.43	89.99	90.29	90.46
2005	7	4	90.39	0.22	90.19	90.30	90.69	90.38
2006	7	4	90.35	0.20	90.13	90.25	90.46	90.57
2001	8	4	89.49	0.18	89.28	89.42	89.53	89.71
2002	8	4	89.54	0.14	89.37	89.50	89.59	89.69
2003	8	4	89.89	0.12	89.74	89.87	90.03	89.92
2004	8	4	89.77	0.03	89.79	89.78	89.72	89.78
2005	8	4	89.98	0.08	89.87	90.01	90.05	89.98
2006	8	4	89.93	0.13	89.80	89.94	89.88	90.10
2001	9	4	90.53	0.17	90.34	90.42	90.68	90.66
2002	9	4	90.50	0.09	90.39	90.56	90.48	90.58
2003	9	4	91.00	0.26	90.64	91.21	91.16	90.97
2004	9	4	90.72	0.09	90.79	90.67	90.62	90.81
2005	9	4	91.09	0.13	90.96	91.07	91.06	91.28
2006	9	4	91.21	0.18	91.22	91.01	91.17	91.44
2001	10	4	89.18	0.10	89.10	89.30	89.10	89.21
2002	10	4	89.19	0.10	89.16	89.27	89.05	89.26
2003	10	4	89.46	0.02	89.47	89.49	89.45	89.43
2004	10	4	89.47	0.12	89.59	89.50	89.32	89.48
2005	10	4	89.75	0.05	89.70	89.82	89.74	89.72
2006	10	4	89.52	0.11	89.45	89.60	89.39	89.62
2001	13	4	91.68	0.03	91.71	91.66	91.69	91.66
2002	13	4	90.93	0.10	90.83	90.88	90.97	91.05
2003	13	4	91.61	0.13	91.49	91.52	91.75	91.70
2004	13	4	91.28	0.11	91.15	91.26	91.33	91.39
2005	13	4	91.22	0.10	91.11	91.20	91.22	91.34
2006	13	4	91.24	0.10	91.12	91.19	91.30	91.34
2001	14	4	89.61	0.15	89.45	89.58	89.60	89.82
2002	14	4	89.50	0.03	89.55	89.51	89.47	89.49
2003	14	4	89.68	0.11	89.72	89.59	89.60	89.83
2004	14	4	90.44	0.07	90.34	90.44	90.48	90.49
2005	14	4	90.26	0.07	90.35	90.26	90.21	90.21
2006	14	4	89.93	0.16	90.05	90.02	89.96	89.69
2001	15	4	89.32	0.12	89.47	89.31	89.18	89.34
2002	15	4	89.57	0.18	89.74	89.70	89.46	89.37

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	89.90	0.36	89.78	89.44	90.15	90.22
2004	15	4	89.65	0.31	89.78	89.19	89.86	89.78
2005	15	4	90.06	0.16	89.86	90.14	90.22	90.00
2006	15	4	89.22	0.34	88.74	89.29	89.53	89.33
2001	17	4	89.63	0.17	89.50	89.86	89.64	89.50
2002	17	4	89.77	0.25	90.05	89.48	89.68	89.88
2003	17	4	89.58	0.49C	89.89	88.86	89.64	89.92
2004	17	4	89.67	0.14	89.55	89.87	89.62	89.65
2005	17	4	89.57	0.27	89.94	89.28	89.51	89.56
2006	17	4	89.53	0.19	89.28	89.54	89.56	89.73
2001	18	4	89.60	0.06	89.60	89.53	89.60	89.66
2002	18	4	89.53	0.22	89.34	89.83	89.56	89.38
2003	18	4	89.85	0.25	89.86	89.64	90.20	89.71
2004	18	4	89.71	0.10	89.64	89.64	89.68	89.86
2005	18	4	89.80	0.09	89.93	89.73	89.74	89.80
2006	18	4	89.47	0.10	89.53	89.55	89.33	89.46
2001	19	4	89.85	0.04	89.86	89.90	89.84	89.81
2002	19	4	89.65	0.21	89.44	89.92	89.70	89.53
2003	19	4	89.87	0.22	90.06	89.77	90.04	89.60
2004	19	4	89.57	0.02	89.55	89.58	89.60	89.57
2005	19	4	89.74	0.04	89.73	89.70	89.72	89.80
2006	19	4	89.47	0.10	89.52	89.56	89.32	89.47
2001	20	4	90.14	0.13	90.33	90.01	90.11	90.14
2002	20	4	89.97	0.09	89.92	90.09	89.88	89.99
2003	20	4	90.69	0.33	90.80	90.39	91.10	90.46
2004	20	4	90.32	0.11	90.34	90.46	90.32	90.18
2005	20	4	90.44	0.07	90.49	90.34	90.48	90.46
2006	20	4	90.25	0.12	90.24	90.34	90.09	90.34
2001	22	4	90.51	0.08	90.59	90.47	90.58	90.42
2002	22	4	90.41	0.08	90.49	90.35	90.34	90.46
2003	22	4	90.95	0.09	90.83	90.99	91.03	90.94
2004	22	4	91.02	0.10	91.10	90.87	91.08	91.04
2005	22	4	91.03	0.17	91.12	90.95	90.84	91.21
2006	22	4	90.73	0.14	90.85	90.66	90.86	90.57
2001	23	4	90.46	0.22	90.79	90.42	90.30	90.34
2002	23	4	90.44	0.10	90.45	90.48	90.30	90.53
2003	23	4	90.84	0.24	90.73	91.00	91.07	90.56
2004	23	4	90.88	0.16	90.73	90.77	91.08	90.92
2005	23	4	91.11	0.31	91.52	90.88	90.87	91.17
2006	23	4	90.90	0.16	91.04	90.68	90.87	91.00
2001	24	4	89.65	0.11	89.70	89.58	89.54	89.79
2002	24	4	89.64	0.09	89.68	89.73	89.52	89.63
2003	24	4	89.94	0.13	89.94	89.80	90.10	89.91
2004	24	4	89.92	0.15	90.12	89.82	89.78	89.95
2005	24	4	89.94	0.11	89.77	89.98	90.00	89.99
2006	24	4	89.81	0.13	89.75	89.98	89.69	89.83
2001	25	4	90.57	0.14	90.60	90.36	90.64	90.66
2002	25	4	90.55	0.06	90.58	90.48	90.61	90.53
2003	25	4	90.67	0.11	90.65	90.60	90.61	90.83
2004	25	4	90.82	0.13	90.80	91.01	90.76	90.72
2005	25	4	91.08	0.13	91.00	91.25	91.09	90.97
2006	25	4	90.91	0.07	90.82	90.91	90.98	90.95
2001	26	4	90.11	0.17	89.96	90.29	90.22	89.98

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	89.89	0.14	89.82	89.96	90.06	89.74
2003	26	4	90.03	0.23	90.09	90.21	90.11	89.70
2004	26	4	90.53	0.12	90.70	90.48	90.48	90.44
2005	26	4	90.66	0.17	90.51	90.88	90.54	90.72
2006	26	4	90.54	0.22	90.42	90.72	90.73	90.29
2001	27	4	90.27	0.10	90.40	90.25	90.27	90.17
2002	27	4	90.24	0.15	90.08	90.41	90.31	90.15
2003	27	4	90.37	0.04	90.32	90.39	90.40	90.37
2004	27	4	90.38	0.09	90.44	90.34	90.28	90.46
2005	27	4	90.34	0.12	90.40	90.16	90.42	90.39
2006	27	4	90.38	0.08	90.46	90.33	90.43	90.28
2001	28	4	89.76	0.08	89.81	89.84	89.69	89.69
2002	28	4	89.65	0.06	89.71	89.69	89.57	89.64
2003	28	4	89.89	0.10	90.03	89.88	89.81	89.84
2004	28	4	90.02	0.25	89.80	89.88	90.02	90.37
2005	28	4	90.17	0.10	90.22	90.17	90.04	90.27
2006	28	4	89.87	0.14	89.67	90.00	89.87	89.93
2001	29	4	91.15	0.16	91.29	91.01	91.27	91.01
2002	29	4	91.17	0.10	91.05	91.16	91.20	91.28
2003	29	4	91.12	0.21	90.84	91.09	91.35	91.18
2004	29	4	90.98	0.17	91.13	90.79	91.11	90.89
2005	29	4	91.24	0.13	91.23	91.16	91.42	91.15
2006	29	3	91.87	0.58C	91.77	91.34	92.50	
2001	30	4	91.40	0.02	91.37	91.39	91.42	91.41
2002	30	4	90.78	0.28	90.39	90.75	90.89	91.06
2003	30	4	91.80	0.02	91.80	91.78	91.81	91.83
2004	30	4	90.52	0.25	90.25	90.39	90.80	90.66
2005	30	4	91.32	0.05	91.29	91.26	91.35	91.36
2006	30	4	90.78	0.17	90.56	90.75	90.89	90.94
2001	31	4	89.71	0.53C	90.50	89.39	89.50	89.43
2002	31	4	89.69	0.38 c	89.22	89.56	90.03	89.97
2003	31	4	89.84	0.03	89.82	89.85	89.86	89.81
2004	31	4	89.98	0.31	90.31	90.18	89.69	89.75
2005	31	4	90.26	0.16	90.21	90.47	90.10	90.28
2006	31	4	90.10	0.38	89.91	89.95	90.67	89.88
2001	32	4	89.85	0.11	89.74	89.84	90.01	89.81
2002	32	4	90.16	0.11	90.04	90.17	90.14	90.30
2003	32	4	90.45	0.15	90.65	90.45	90.43	90.28
2004	32	4	90.26	0.15	90.40	90.38	90.19	90.09
2005	32	4	90.58	0.12	90.74	90.51	90.58	90.48
2006	32	4	90.33	0.04	90.36	90.34	90.33	90.27
2001	33	4	91.45	0.16	91.37	91.49	91.64	91.28
2002	33	4	91.09	0.26	90.90	91.42	90.87	91.18
2003	33	4	91.36	0.12	91.28	91.33	91.53	91.28
2004	33	4	91.30	0.03	91.29	91.32	91.26	91.31
2005	33	4	91.64	0.13	91.48	91.77	91.71	91.60
2006	33	4	91.54	0.08	91.64	91.53	91.44	91.53
2001	34	4	90.10	0.12	89.99	90.11	90.04	90.26
2002	34	4	89.90	0.10	89.81	89.92	89.84	90.04
2003	34	4	90.47	0.17	90.38	90.47	90.33	90.71
2004	34	4	89.95	0.05	89.89	90.00	89.96	89.97
2005	34	4	90.50	0.16	90.66	90.40	90.60	90.32
2006	34	4	90.71	0.25	90.80	90.34	90.78	90.93

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	89.24	0.08	89.13	89.31	89.28	89.25		
2002	35	4	89.07	0.14	88.99	89.19	88.91	89.19		
2003	35	4	89.06	0.18	89.30	88.88	89.10	88.97		
2004	35	4	89.41	0.13	89.43	89.28	89.36	89.59		
2005	35	4	89.59	0.12	89.68	89.44	89.70	89.56		
2006	35	4	89.37	0.22	89.52	89.05	89.50	89.41		
2001	36	4	89.15	0.04	89.18	89.17	89.15	89.10		
2002	36	4	89.09	0.03	89.05	89.10	89.11	89.12		
2003	36	4	89.35	0.11	89.38	89.25	89.49	89.26		
2004	36	4	89.43	0.11	89.44	89.45	89.28	89.53		
2005	36	4	89.66	0.19	89.85	89.57	89.44	89.80		
2006	36	4	89.47	0.22	89.68	89.23	89.35	89.63		
2001	37	6	89.71	0.17	89.96	89.70	89.68	89.44	89.70	89.78
2002	37	6	89.94	0.12	90.02	89.78	89.80	90.09	89.95	89.99
2003	37	6	90.30	0.18	90.66	90.21	90.18	90.27	90.21	90.28
2004	37	6	90.33	0.26	90.74	90.35	90.48	90.14	90.21	90.03
2005	37	6	90.37	0.13	90.49	90.54	90.37	90.32	90.19	90.32
2006	37	6	90.15	0.31	90.64	90.25	89.88	90.32	89.87	89.94
2001	38	4	89.36	0.14	89.31	89.30	89.28	89.56		
2002	38	4	89.58	0.16	89.63	89.55	89.39	89.77		
2003	38	4	90.02	0.05	89.96	90.06	90.00	90.05		
2004	38	4	89.71	0.08	89.77	89.67	89.61	89.78		
2005	38	4	90.26	0.23	90.41	90.16	90.47	89.98		
2006	38	4	90.30	0.15	90.40	90.07	90.36	90.36		
2001	40	4	90.50	0.25	90.31	90.78	90.63	90.27		
2002	40	4	90.65	0.19	90.61	90.79	90.40	90.80		
2003	40	4	91.43	0.21	91.34	91.28	91.74	91.34		
2004	40	4	91.34	0.40C	91.12	91.94	91.09	91.21		
2005	40	4	91.38	0.34	91.01	91.56	91.21	91.75		
2006	40	4	92.01	0.47 c	91.36	92.29	92.39	92.01		
2001	113	4	90.32	0.13	90.16	90.27	90.39	90.46		
2002	113	4	90.23	0.19	90.42	90.36	90.10	90.03		
2003	113	5	90.86	0.25	90.73	90.95	91.02	91.12	90.50	
2004	113	5	90.35	0.10	90.22	90.27	90.39	90.45	90.43	
2005	113	5	90.16	0.12	89.99	90.12	90.14	90.31	90.22	
2006	113	5	90.58	0.14	90.72	90.39	90.47	90.63	90.69	
2001	137	6	89.33	0.16	89.53	89.32	89.46	89.05	89.31	89.30
2002	137	6	89.52	0.12	89.67	89.40	89.38	89.55	89.48	89.62
2003	137	6	89.93	0.13	90.15	89.82	89.88	89.93	89.81	90.01
2004	137	6	89.86	0.19	90.03	90.03	90.02	89.68	89.78	89.63
2005	137	6	89.97	0.17	90.16	90.10	89.92	90.03	89.71	89.89
2006	137	6	89.68	0.26	90.08	89.58	89.44	89.92	89.49	89.59

18.2 Rohprotein / XP

18.2.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	0.85	0.89	0.46	0.71	0.41	0.50
3	0.68	-0.59	-0.10	-0.06	0.17	0.16
5	-3.08	-1.55	-1.33	-1.41	-1.65	-1.74
6	-1.21	-1.41	-0.65	-0.92	-0.68	-0.49
7	1.41	1.03	0.54	0.01	0.33	0.56
8	2.52	1.48	1.27	1.45	1.38	1.49
9	-0.88	-0.62	-0.97	-0.61	-0.84	-1.10
10	-0.20	-0.06	-0.23	0.15	-0.43	-0.52
13	-3.17	-1.53	-0.85	-0.86	-1.33	-1.54
14	0.61	0.38	0.23	0.37	0.57	0.53
15	-0.39	-1.00	-0.37	-0.66	-0.85	-0.71
17	-1.55	0.15	-0.34	-0.49	-0.41	0.23
18	0.99	0.23	-0.08	0.41	0.06	0.38
19	1.46	1.16	0.80	1.28	0.85	1.23
20	1.42	0.91	0.99	0.93	0.70	1.18
22	1.94	1.03	1.38	1.17	1.10	1.78
23	-0.58	-0.51	-0.13	-0.23	-0.96	-0.33
24	0.92	0.61	-0.03	0.52	0.32	0.26
25	-0.57	-0.26	0.32	-0.09	-0.20	-0.04
26	-1.06	0.12	-0.09	-0.81	-0.38	-0.09
27	-0.08	-0.31	-0.29	0.03	0.36	-0.40
28	1.58	0.26	0.42	0.17	0.94	0.88
29	0.91	0.54	0.18	-0.05	-0.02	-1.30
30	2.10	2.20	2.24	3.36	2.12	2.24
31	0.26	1.06	0.19	0.75	0.21	0.52
32	-1.15	-0.38	-0.71	-0.72	-0.56	-0.85
33	2.73	1.37	0.84	0.99	1.38	1.47
34	-1.21	0.51	-0.10	0.59	0.71	-0.19
35	1.01	0.13	0.07	-0.12	-0.09	0.14
36	0.53	0.05	0.57	0.02	0.30	0.88
37	0.09	-1.59	-0.32	-0.20	-0.79	-0.69
38	-2.89	-0.96	-1.10	-0.04	-0.38	-0.92
40	-1.67	-1.65	-1.64	-1.41	-0.91	-1.89
113	-2.09	0.41	-0.34	-0.20	-0.31	-0.13
137	-0.25	-2.08	-0.81	-0.64	-1.12	-1.03

18.2.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	6.95	0.13	7.10	6.93	6.98	6.78
2002	1	4	6.32	0.08	6.29	6.44	6.28	6.25
2003	1	4	7.22	0.06	7.16	7.29	7.18	7.26
2004	1	4	7.13	0.07	7.08	7.22	7.10	7.11
2005	1	4	6.60	0.08	6.60	6.64	6.49	6.67
2006	1	4	6.50	0.03	6.48	6.50	6.54	6.47
2001	3	4	6.90	0.13	7.06	6.93	6.88	6.74
2002	3	4	5.95	0.05	5.88	5.96	6.00	5.95
2003	3	4	7.08	0.12	7.04	7.22	7.13	6.93

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	6.94	0.15	7.02	7.04	6.71	6.98
2005	3	4	6.54	0.16	6.35	6.74	6.52	6.55
2006	3	4	6.41	0.12	6.29	6.34	6.56	6.46
2001	5	4	5.96	0.03	5.96	5.95	5.95	6.01
2002	5	4	5.71	0.07	5.65	5.64	5.79	5.74
2003	5	4	6.78	0.04	6.78	6.78	6.72	6.82
2004	5	4	6.60	0.06	6.68	6.56	6.57	6.59
2005	5	4	6.08	0.05	6.16	6.07	6.04	6.07
2006	5	4	5.94	0.08	5.87	6.04	5.87	5.97
2001	6	4	6.43	0.14	6.44	6.63	6.31	6.35
2002	6	4	5.74	0.09	5.77	5.73	5.62	5.85
2003	6	4	6.94	0.08	7.02	6.98	6.83	6.94
2004	6	4	6.72	0.15	6.82	6.53	6.85	6.68
2005	6	4	6.33	0.12	6.44	6.39	6.17	6.31
2006	6	4	6.25	0.12	6.19	6.26	6.13	6.42
2001	7	4	7.09	0.20	7.19	7.09	6.81	7.27
2002	7	4	6.35	0.15	6.47	6.47	6.15	6.31
2003	7	4	7.24	0.04	7.25	7.30	7.20	7.22
2004	7	4	6.95	0.10	6.83	7.07	6.92	7.00
2005	7	4	6.58	0.12	6.65	6.70	6.43	6.54
2006	7	4	6.51	0.13	6.61	6.61	6.35	6.47
2001	8	4	7.37	0.06	7.36	7.30	7.44	7.37
2002	8	4	6.46	0.07	6.52	6.37	6.46	6.51
2003	8	4	7.42	0.04	7.47	7.39	7.39	7.44
2004	8	4	7.31	0.12	7.42	7.30	7.15	7.38
2005	8	4	6.84	0.06	6.90	6.76	6.88	6.83
2006	8	4	6.75	0.04	6.75	6.80	6.69	6.75
2001	9	4	6.51	0.20	6.59	6.66	6.22	6.59
2002	9	4	5.94	0.05	5.99	5.97	5.94	5.87
2003	9	4	6.86	0.10	6.96	6.78	6.94	6.76
2004	9	4	6.80	0.15	6.73	6.72	7.02	6.72
2005	9	4	6.29	0.09	6.35	6.26	6.36	6.17
2006	9	4	6.10	0.13	6.10	6.24	6.14	5.92
2001	10	4	6.68	0.14	6.80	6.59	6.81	6.54
2002	10	4	6.08	0.04	6.05	6.13	6.09	6.04
2003	10	4	7.05	0.12	6.94	7.21	7.00	7.05
2004	10	4	6.99	0.07	7.05	6.91	7.04	6.94
2005	10	4	6.39	0.06	6.35	6.48	6.36	6.36
2006	10	4	6.24	0.04	6.25	6.19	6.24	6.29
2001	13	4	5.94	0.01	5.96	5.94	5.95	5.93
2002	13	4	5.71	0.04	5.77	5.69	5.70	5.69
2003	13	4	6.89	0.03	6.89	6.93	6.90	6.86
2004	13	4	6.74	0.03	6.77	6.75	6.71	6.71
2005	13	4	6.17	0.02	6.19	6.16	6.16	6.16
2006	13	4	5.99	0.04	6.02	6.02	5.97	5.94
2001	14	4	6.89	0.15	7.12	6.79	6.80	6.83
2002	14	4	6.19	0.09	6.21	6.30	6.08	6.16
2003	14	4	7.17	0.03	7.20	7.12	7.16	7.19
2004	14	4	7.04	0.06	7.10	6.99	7.09	7.00
2005	14	4	6.64	0.07	6.56	6.71	6.62	6.67
2006	14	4	6.51	0.07	6.50	6.60	6.43	6.50
2001	15	4	6.64	0.05	6.60	6.62	6.71	6.62
2002	15	4	5.84	0.11	5.71	5.84	5.85	5.97

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	7.01	0.05	6.99	7.06	6.96	7.04
2004	15	4	6.79	0.09	6.89	6.75	6.69	6.82
2005	15	4	6.29	0.07	6.33	6.32	6.32	6.19
2006	15	4	6.20	0.12	6.02	6.23	6.28	6.25
2001	17	4	6.35	0.21	6.61	6.21	6.41	6.16
2002	17	4	6.13	0.08	6.15	6.02	6.19	6.17
2003	17	4	7.02	0.18	7.06	6.78	7.21	7.04
2004	17	4	6.83	0.02	6.81	6.86	6.81	6.84
2005	17	4	6.40	0.11	6.34	6.30	6.40	6.55
2006	17	4	6.43	0.08	6.52	6.37	6.48	6.35
2001	18	4	6.98	0.05	6.93	7.04	6.95	7.01
2002	18	4	6.15	0.04	6.21	6.11	6.12	6.16
2003	18	4	7.09	0.11	6.93	7.17	7.08	7.17
2004	18	4	7.06	0.09	7.11	7.11	6.92	7.07
2005	18	4	6.51	0.07	6.42	6.52	6.60	6.52
2006	18	4	6.47	0.05	6.40	6.49	6.47	6.51
2001	19	4	7.10	0.08	7.06	7.11	7.02	7.20
2002	19	4	6.38	0.06	6.46	6.31	6.37	6.39
2003	19	4	7.31	0.06	7.23	7.33	7.31	7.36
2004	19	4	7.27	0.11	7.32	7.36	7.11	7.29
2005	19	4	6.71	0.04	6.66	6.72	6.75	6.71
2006	19	4	6.68	0.10	6.60	6.73	6.60	6.79
2001	20	4	7.09	0.12	7.02	7.18	6.95	7.21
2002	20	4	6.32	0.05	6.38	6.32	6.31	6.27
2003	20	4	7.35	0.08	7.43	7.40	7.28	7.30
2004	20	4	7.18	0.08	7.18	7.27	7.09	7.20
2005	20	4	6.67	0.07	6.65	6.58	6.73	6.74
2006	20	4	6.67	0.13	6.61	6.63	6.58	6.87
2001	22	4	7.22	0.13	7.21	7.37	7.25	7.05
2002	22	4	6.35	0.14	6.15	6.42	6.38	6.46
2003	22	4	7.45	0.12	7.35	7.36	7.57	7.54
2004	22	4	7.24	0.12	7.11	7.29	7.38	7.18
2005	22	4	6.77	0.15	6.85	6.87	6.55	6.82
2006	22	4	6.82	0.15	6.74	7.04	6.77	6.72
2001	23	4	6.59	0.16	6.50	6.46	6.83	6.57
2002	23	4	5.97	0.05	6.00	5.97	6.00	5.89
2003	23	4	7.08	0.10	7.19	6.99	7.00	7.12
2004	23	4	6.89	0.11	7.03	6.92	6.86	6.77
2005	23	4	6.26	0.13	6.07	6.35	6.35	6.26
2006	23	4	6.29	0.08	6.37	6.30	6.19	6.30
2001	24	4	6.97	0.11	7.13	6.93	6.92	6.88
2002	24	4	6.25	0.03	6.21	6.23	6.25	6.28
2003	24	4	7.10	0.03	7.13	7.09	7.12	7.06
2004	24	4	7.08	0.04	7.07	7.12	7.09	7.04
2005	24	4	6.58	0.04	6.55	6.54	6.60	6.62
2006	24	4	6.44	0.02	6.43	6.41	6.47	6.45
2001	25	4	6.59	0.08	6.61	6.47	6.65	6.63
2002	25	4	6.03	0.03	5.99	6.07	6.01	6.05
2003	25	4	7.19	0.13	7.26	7.03	7.14	7.32
2004	25	4	6.93	0.05	6.88	6.88	6.97	6.98
2005	25	4	6.45	0.05	6.47	6.43	6.39	6.50
2006	25	4	6.36	0.02	6.35	6.36	6.39	6.35
2001	26	4	6.47	0.09	6.39	6.51	6.40	6.58

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	6.12	0.14	5.94	6.26	6.09	6.20
2003	26	4	7.08	0.13	7.07	6.90	7.18	7.18
2004	26	4	6.75	0.03	6.76	6.74	6.78	6.72
2005	26	4	6.40	0.03	6.43	6.40	6.37	6.41
2006	26	4	6.35	0.12	6.32	6.26	6.30	6.52
2001	27	4	6.71	0.11	6.57	6.77	6.71	6.81
2002	27	4	6.02	0.05	6.01	6.08	5.98	6.00
2003	27	4	7.03	0.04	7.08	7.00	7.01	7.04
2004	27	4	6.96	0.02	6.98	6.94	6.97	6.94
2005	27	4	6.59	0.04	6.61	6.56	6.55	6.64
2006	27	4	6.27	0.06	6.29	6.25	6.20	6.35
2001	28	4	7.13	0.12	7.08	7.05	7.07	7.31
2002	28	4	6.16	0.03	6.12	6.19	6.17	6.16
2003	28	4	7.21	0.12	7.30	7.27	7.03	7.25
2004	28	4	6.99	0.25	7.03	7.10	7.21	6.64
2005	28	4	6.73	0.22 c	6.66	6.63	7.06	6.59
2006	28	4	6.59	0.04	6.59	6.54	6.64	6.60
2001	29	4	6.96	0.09	6.84	7.01	7.03	6.97
2002	29	4	6.23	0.16	6.17	6.17	6.47	6.10
2003	29	4	7.15	0.12	7.14	6.99	7.24	7.24
2004	29	4	6.94	0.22	7.10	6.97	7.07	6.62
2005	29	4	6.49	0.09	6.61	6.51	6.40	6.46
2006	29	3	6.05	0.16	6.15	6.13	5.86	
2001	30	4	7.26	0.07	7.31	7.17	7.24	7.31
2002	30	4	6.64	0.03	6.66	6.63	6.62	6.67
2003	30	4	7.67	0.03	7.66	7.68	7.70	7.63
2004	30	0	7.79B	0.04	7.84	7.78	7.80	7.74
2005	30	4	7.03	0.02	7.01	7.02	7.03	7.05
2006	30	4	6.93	0.05	7.00	6.90	6.91	6.93
2001	31	4	6.80	0.39C	7.36	6.68	6.46	6.71
2002	31	4	6.36	0.17	6.33	6.24	6.61	6.26
2003	31	4	7.15	0.03	7.12	7.15	7.18	7.16
2004	31	4	7.14	0.17	7.37	6.97	7.15	7.06
2005	31	4	6.55	0.12	6.44	6.71	6.56	6.49
2006	31	3	6.38	0.02	6.37	6.40	6.87A	6.37
2001	32	4	6.45	0.11	6.42	6.49	6.31	6.57
2002	32	4	6.00	0.07	6.06	5.94	6.06	5.94
2003	32	4	6.93	0.08	7.04	6.84	6.92	6.92
2004	32	4	6.77	0.09	6.85	6.76	6.83	6.64
2005	32	4	6.36	0.06	6.30	6.34	6.44	6.35
2006	32	4	6.16	0.09	6.03	6.25	6.20	6.17
2001	33	4	7.42	0.11	7.55	7.29	7.38	7.45
2002	33	4	6.44	0.07	6.47	6.36	6.39	6.52
2003	33	4	7.32	0.07	7.34	7.34	7.22	7.37
2004	33	4	7.20	0.17	7.01	7.39	7.29	7.11
2005	33	4	6.84	0.10	6.75	6.99	6.81	6.82
2006	33	4	6.74	0.08	6.79	6.81	6.64	6.72
2001	34	4	6.43	0.12	6.50	6.31	6.36	6.56
2002	34	4	6.22	0.10	6.14	6.34	6.13	6.27
2003	34	4	7.08	0.17	7.16	7.23	7.09	6.84
2004	34	4	7.10	0.14	7.22	6.96	7.22	6.99
2005	34	4	6.68	0.10	6.75	6.76	6.54	6.64
2006	34	4	6.33	0.13	6.50	6.33	6.22	6.24

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	6.99	0.08	7.03	6.89	7.07	6.96		
2002	35	4	6.13	0.09	6.11	6.16	6.22	6.02		
2003	35	4	7.13	0.11	7.00	7.20	7.23	7.07		
2004	35	4	6.92	0.11	7.04	6.97	6.87	6.80		
2005	35	4	6.48	0.08	6.46	6.43	6.60	6.42		
2006	35	4	6.41	0.06	6.37	6.35	6.47	6.45		
2001	36	4	6.87	0.05	6.93	6.81	6.85	6.88		
2002	36	4	6.11	0.08	6.08	6.09	6.04	6.22		
2003	36	4	7.25	0.09	7.28	7.12	7.28	7.32		
2004	36	4	6.96	0.05	7.01	6.97	6.89	6.95		
2005	36	4	6.57	0.08	6.51	6.69	6.56	6.53		
2006	36	4	6.59	0.04	6.59	6.59	6.65	6.55		
2001	37	6	6.76	0.18	6.70	6.91	6.79	6.44	6.77	6.92
2002	37	6	5.70	0.07	5.75	5.63	5.82	5.65	5.66	5.68
2003	37	6	7.03	0.05	6.96	6.99	7.01	7.04	7.05	7.10
2004	37	6	6.90	0.08	6.85	6.82	7.04	6.95	6.89	6.86
2005	37	6	6.30	0.09	6.25	6.38	6.19	6.40	6.37	6.22
2006	37	6	6.20	0.08	6.30	6.19	6.22	6.24	6.20	6.05
2001	38	4	6.01	0.08	6.03	6.12	5.94	5.96		
2002	38	4	5.85	0.13	5.88	6.01	5.69	5.84		
2003	38	4	6.83	0.07	6.91	6.82	6.86	6.74		
2004	38	4	6.94	0.08	7.05	6.87	6.90	6.94		
2005	38	4	6.40	0.18	6.59	6.52	6.29	6.21		
2006	38	4	6.14	0.08	6.24	6.13	6.15	6.05		
2001	40	4	6.32	0.42C	6.74	5.83	6.12	6.58		
2002	40	4	5.68	0.18	5.67	5.68	5.91	5.46		
2003	40	4	6.70	0.30C	7.06	6.83	6.48	6.41		
2004	40	4	6.60	0.26 c	6.75	6.21	6.76	6.66		
2005	40	4	6.27	0.13	6.37	6.11	6.37	6.24		
2006	40	4	5.90	0.15	6.11	5.77	5.90	5.83		
2001	113	4	6.21	0.03	6.21	6.25	6.18	6.21		
2002	113	4	6.20	0.03	6.17	6.16	6.22	6.23		
2003	113	5	7.02	0.12	6.98	6.99	6.93	6.99	7.22	
2004	113	5	6.90	0.03	6.95	6.92	6.89	6.87	6.88	
2005	113	5	6.42	0.03	6.46	6.43	6.42	6.41	6.38	
2006	113	5	6.34	0.02	6.33	6.37	6.33	6.33	6.35	
2001	137	6	6.67	0.17	6.58	6.86	6.68	6.38	6.79	6.74
2002	137	6	5.57	0.10	5.69	5.44	5.71	5.51	5.54	5.56
2003	137	6	6.90	0.07	6.92	6.81	6.95	6.84	6.91	7.00
2004	137	6	6.79	0.08	6.79	6.68	6.91	6.79	6.85	6.73
2005	137	6	6.22	0.08	6.21	6.28	6.18	6.28	6.28	6.09
2006	137	6	6.12	0.10	6.17	6.13	6.22	6.09	6.16	5.93

18.3 Rohfaser / XF

18.3.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-0.18	-0.98	-0.63	-0.86	-0.81	-0.42
3	-1.46	-0.43	-0.64	-0.36	-0.65	0.19
5	1.12	0.64	0.78	1.39	0.65	0.67
6	-0.51	1.11	1.75	1.37	1.02	0.30
7	0.01	0.47	0.70	0.77	0.03	0.78
8	-0.43	-0.74	-1.32	-1.09	-1.19	-0.88
9	0.13	0.15	0.51	0.21	0.34	0.40
10	-0.69	-0.53	-0.23	-0.28	-0.06	0.13
13	1.35	0.30	0.07	0.04	1.15	0.11
14	-0.12	-0.33	-0.23	-0.05	-0.07	-0.14
15	-0.78	0.28	0.32	-0.05	0.10	-1.41
17	0.61	1.84	1.71	2.21	1.65	0.75
18	0.25	-0.03	-0.41	-0.02	-0.02	-0.85
19	0.01	-0.34	-0.59	-0.31	-0.31	-0.92
20	-0.38	-0.94	-1.38	-1.06	-1.03	-1.40
22	1.50	0.78	0.39	0.63	0.58	0.86
23	-0.25	0.57	0.12	0.44	0.90	0.71
24	-0.62	-0.55	-0.12	-0.16	-0.24	0.16
25	-0.46	-0.48	-0.75	-0.38	-0.36	-0.69
26	-0.71	-0.05	0.19	0.97	0.36	0.45
27	0.56	0.38	0.17	0.18	-0.24	0.43
28	0.05	0.22	0.51	0.42	0.23	0.41
29	-0.93	-0.59	-0.58	-1.14	0.17	1.55
30	0.60	0.52	1.32	-1.84	-0.49	0.60
31	-0.94	0.53	0.72	0.88	0.93	0.93
32	-0.87	-0.68	-0.25	0.40	0.44	0.70
33	-0.80	-0.54	-0.13	-0.17	-0.21	-0.64
34	0.88	1.08	0.84	0.49	0.37	0.68
35	-0.92	-0.08	-0.33	0.42	0.26	-0.49
36	1.15	0.96	0.26	1.42	0.91	0.15
37	1.15	-0.82	-1.48	-1.57	-1.33	-1.38
38	0.25	1.35	1.14	0.84	0.09	1.31
40	0.08	-0.14	-0.08	0.13	-0.40	-0.32
113	0.07	-2.25	-1.04	-2.43	-1.54	-1.39
137	1.27	-0.69	-1.29	-1.45	-1.24	-1.33

18.3.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	26.95	0.13	26.80	26.90	27.07	27.06
2002	1	4	17.03	0.18	16.98	16.81	17.09	17.23
2003	1	4	15.38	0.15	15.56	15.43	15.33	15.20
2004	1	4	15.06	0.15	15.25	14.88	15.04	15.07
2005	1	4	15.42	0.57	16.05	14.80	15.74	15.12
2006	1	4	16.27	0.23	16.03	16.23	16.22	16.58
2001	3	4	25.67	0.50	25.37	25.88	25.18	26.27
2002	3	4	17.58	0.29	17.61	17.87	17.65	17.17
2003	3	4	15.37	0.20	15.57	15.43	15.10	15.38

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	15.56	0.28	15.88	15.28	15.69	15.38
2005	3	4	15.59	0.17	15.52	15.54	15.85	15.46
2006	3	4	16.88	0.24	17.21	16.63	16.85	16.82
2001	5	4	28.25	0.07	28.32	28.22	28.17	28.29
2002	5	4	18.65	0.19	18.84	18.58	18.76	18.43
2003	5	4	16.79	0.12	16.68	16.95	16.74	16.80
2004	5	4	17.31	0.22	17.12	17.56	17.42	17.14
2005	5	4	16.88	0.11	16.94	16.81	17.00	16.77
2006	5	4	17.36	0.14	17.48	17.33	17.44	17.18
2001	6	4	26.62	0.48	26.06	26.45	26.80	27.19
2002	6	4	19.12	0.21	18.96	19.10	19.42	18.99
2003	6	4	17.77	0.29	17.44	18.11	17.65	17.85
2004	6	4	17.29	0.67	16.65	17.94	16.79	17.79
2005	6	4	17.26	0.50	16.52	17.61	17.52	17.38
2006	6	4	16.99	0.43	17.24	17.47	16.62	16.63
2001	7	4	27.14	0.25	27.15	27.19	27.41	26.80
2002	7	4	18.48	0.21	18.32	18.62	18.69	18.27
2003	7	4	16.71	0.17	16.65	16.97	16.66	16.57
2004	7	4	16.69	0.84	17.68	16.72	15.63	16.74
2005	7	4	16.27	0.40	16.55	16.34	16.51	15.69
2006	7	4	17.47	0.23	17.65	17.40	17.18	17.66
2001	8	4	26.70	0.15	26.71	26.67	26.53	26.90
2002	8	4	17.27	0.26	17.61	17.02	17.09	17.33
2003	8	4	14.69	0.60	15.47	14.80	14.08	14.40
2004	8	4	14.83	0.14	14.74	15.04	14.77	14.75
2005	8	4	15.05	0.06	15.07	15.04	14.98	15.11
2006	8	4	15.81	0.31	15.67	15.56	16.26	15.74
2001	9	4	27.26	0.15	27.31	27.18	27.45	27.10
2002	9	4	18.16	0.14	18.26	18.04	18.30	18.03
2003	9	4	16.52	0.26	16.43	16.81	16.21	16.62
2004	9	4	16.13	0.22	16.12	16.44	15.92	16.04
2005	9	4	16.58	0.23	16.70	16.25	16.62	16.75
2006	9	4	17.09	0.13	16.94	17.16	17.02	17.24
2001	10	4	26.45	0.40	26.30	26.38	26.09	27.01
2002	10	4	17.48	0.31	17.45	17.29	17.25	17.92
2003	10	4	15.78	0.35	15.88	15.28	16.09	15.87
2004	10	4	15.64	0.13	15.68	15.69	15.45	15.74
2005	10	4	16.18	0.15	16.02	16.37	16.10	16.23
2006	10	4	16.82	0.15	16.89	17.01	16.68	16.72
2001	13	4	28.48	0.07	28.44	28.42	28.50	28.57
2002	13	4	18.31	0.06	18.25	18.29	18.33	18.38
2003	13	4	16.08	0.06	16.02	16.06	16.16	16.08
2004	13	4	15.96	0.07	15.91	16.06	15.94	15.90
2005	13	4	17.39	0.15	17.27	17.39	17.59	17.30
2006	13	4	16.80	0.06	16.83	16.80	16.71	16.84
2001	14	4	27.01	0.35	26.65	26.78	27.23	27.39
2002	14	4	17.68	0.39	17.67	17.18	18.14	17.73
2003	14	4	15.78	0.26	15.56	15.57	16.11	15.88
2004	14	4	15.87	0.16	15.64	16.02	15.93	15.88
2005	14	4	16.17	0.30	16.56	15.84	16.17	16.11
2006	14	4	16.55	0.44	16.11	16.87	16.99	16.24
2001	15	4	26.35	0.17	26.60	26.28	26.27	26.25
2002	15	4	18.29	0.45	18.72	18.53	18.23	17.69

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	16.33	0.67	16.29	15.40	16.90	16.73
2004	15	4	15.87	0.54	16.25	15.15	16.31	15.76
2005	15	4	16.34	0.37	16.18	16.42	15.94	16.81
2006	15	4	15.28	0.87	14.07	15.22	15.89	15.94
2001	17	4	27.74	0.39	27.92	28.15	27.25	27.64
2002	17	4	19.85	0.26	19.52	20.09	20.04	19.77
2003	17	4	17.72	0.15	17.75	17.50	17.80	17.84
2004	17	4	18.13	0.18	18.35	17.93	18.17	18.06
2005	17	4	17.88	0.35	18.00	17.68	18.32	17.53
2006	17	4	17.44	0.12	17.45	17.61	17.33	17.37
2001	18	4	27.39	0.41	27.59	27.33	27.79	26.83
2002	18	4	17.98	0.20	17.68	18.09	18.12	18.02
2003	18	4	15.60	0.19	15.53	15.58	15.43	15.88
2004	18	4	15.90	0.56	15.71	15.20	16.32	16.38
2005	18	4	16.22	0.15	16.42	16.20	16.06	16.20
2006	18	4	15.84	0.54	16.02	15.78	16.42	15.12
2001	19	4	27.14	0.43	27.30	27.09	27.60	26.58
2002	19	4	17.67	0.18	17.62	17.74	17.88	17.45
2003	19	4	15.42	0.15	15.45	15.24	15.38	15.60
2004	19	4	15.61	0.43	15.52	15.04	15.95	15.95
2005	19	4	15.93	0.11	15.95	16.06	15.91	15.79
2006	19	4	15.77	0.40	16.03	15.62	16.16	15.29
2001	20	4	26.75	0.56	26.66	26.89	27.39	26.04
2002	20	4	17.07	0.14	17.00	17.27	16.97	17.05
2003	20	4	14.63	0.39	14.37	14.32	14.69	15.16
2004	20	4	14.86	0.63	14.68	14.12	15.00	15.64
2005	20	4	15.21	0.22	15.21	15.17	14.95	15.49
2006	20	4	15.29	0.55	15.63	15.21	15.76	14.54
2001	22	4	28.63	0.56	29.12	27.87	28.53	28.99
2002	22	4	18.79	0.36	19.08	18.72	19.06	18.31
2003	22	4	16.40	0.53	16.62	15.64	16.84	16.52
2004	22	4	16.55	0.24	16.51	16.23	16.73	16.73
2005	22	4	16.82	0.59	16.73	17.66	16.59	16.28
2006	22	4	17.55	0.12	17.39	17.68	17.57	17.56
2001	23	4	26.88	0.44	26.81	27.52	26.57	26.61
2002	23	4	18.58	0.11	18.47	18.73	18.51	18.61
2003	23	4	16.13	1.18C	15.37	16.85	17.40	14.92
2004	23	4	16.36	0.32	16.02	16.14	16.63	16.63
2005	23	4	17.14	0.97	18.32	16.28	16.41	17.55
2006	23	4	17.40	0.43	17.29	16.98	17.99	17.33
2001	24	4	26.51	0.22	26.29	26.62	26.37	26.77
2002	24	4	17.46	0.10	17.58	17.50	17.38	17.38
2003	24	4	15.89	0.28	15.58	15.74	16.04	16.20
2004	24	4	15.76	0.21	16.08	15.67	15.64	15.65
2005	24	4	16.00	0.22	15.81	16.26	16.12	15.82
2006	24	4	16.85	0.14	16.80	17.01	16.69	16.92
2001	25	4	26.67	0.18	26.51	26.53	26.84	26.81
2002	25	4	17.53	0.07	17.58	17.49	17.45	17.59
2003	25	4	15.26	0.56	14.87	15.66	15.82	14.69
2004	25	4	15.54	0.41	15.56	15.95	15.68	14.98
2005	25	4	15.87	0.46	15.93	15.27	16.38	15.91
2006	25	4	16.00	0.29	16.27	16.00	15.59	16.13
2001	26	4	26.42	0.33	26.07	26.57	26.80	26.24

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	17.96	0.38	18.42	17.54	18.09	17.81
2003	26	4	16.20	1.14C	16.70	17.55	15.55	15.01
2004	26	4	16.89	0.16	17.12	16.88	16.76	16.79
2005	26	4	16.60	0.31	16.84	16.54	16.84	16.18
2006	26	4	17.14	0.62	17.72	17.60	16.84	16.42
2001	27	4	27.69	0.20	27.96	27.48	27.67	27.67
2002	27	4	18.39	0.16	18.43	18.32	18.59	18.21
2003	27	4	16.18	0.12	16.08	16.08	16.26	16.31
2004	27	4	16.10	0.11	15.96	16.12	16.10	16.24
2005	27	4	16.00	0.20	15.82	15.86	16.25	16.08
2006	27	4	17.12	0.26	17.10	17.45	16.83	17.11
2001	28	4	27.18	0.44	27.39	27.42	27.40	26.52
2002	28	4	18.23	0.22	18.11	18.54	18.21	18.06
2003	28	4	16.52	0.50	16.10	16.20	17.19	16.60
2004	28	4	16.34	0.18	16.10	16.46	16.49	16.32
2005	28	4	16.47	0.51	17.19	16.23	16.43	16.02
2006	28	4	17.10	0.30	17.00	17.07	17.53	16.81
2001	29	4	26.20	0.31	26.45	25.94	26.50	25.92
2002	29	4	17.42	0.39	17.25	17.19	17.23	18.00
2003	29	4	15.44	0.20	15.31	15.27	15.71	15.44
2004	29	4	14.77	0.35	14.98	14.28	14.77	15.07
2005	29	4	16.41	0.71	15.97	15.78	16.53	17.36
2006	29	3	18.24	1.08	17.92	17.36	19.45	
2001	30	4	27.73	0.07	27.66	27.82	27.72	27.71
2002	30	4	18.53	0.12	18.39	18.51	18.69	18.53
2003	30	4	17.33	0.20	17.55	17.20	17.45	17.13
2004	30	4	14.07	0.23	14.02	13.92	14.41	13.96
2005	30	4	15.75	0.37	16.22	15.34	15.64	15.82
2006	30	4	17.29	0.11	17.23	17.27	17.45	17.22
2001	31	4	26.19	1.84C	23.60	26.32	27.86	27.00
2002	31	4	18.54	1.12C	18.26	18.57	17.32	20.01
2003	31	4	16.73	0.16	16.78	16.91	16.70	16.53
2004	31	4	16.80	0.80	15.77	17.72	16.91	16.81
2005	31	4	17.17	0.57	17.43	16.36	17.23	17.67
2006	31	4	17.62	0.85	18.11	17.97	16.34	18.05
2001	32	4	26.26	0.62	25.74	26.17	27.16	25.97
2002	32	4	17.33	0.30	17.24	16.98	17.68	17.44
2003	32	4	15.77	0.15	15.90	15.56	15.83	15.78
2004	32	4	16.32	0.43	15.83	16.79	16.55	16.11
2005	32	4	16.68	0.23	16.82	16.81	16.34	16.74
2006	32	4	17.39	0.31	17.54	17.74	17.18	17.09
2001	33	4	26.33	0.18	26.24	26.48	26.50	26.12
2002	33	4	17.47	0.40	17.36	17.80	16.95	17.78
2003	33	4	15.88	0.64	15.85	16.61	16.01	15.05
2004	33	4	15.75	0.31	15.87	15.53	15.48	16.13
2005	33	4	16.03	0.65	15.63	15.76	17.00	15.74
2006	33	4	16.05	0.85	14.93	15.87	16.86	16.54
2001	34	4	28.01	0.32	27.64	27.91	28.42	28.05
2002	34	4	19.09	0.77	19.62	18.31	18.56	19.88
2003	34	4	16.86	0.46	17.30	17.09	16.81	16.23
2004	34	4	16.41	0.62	16.73	16.41	15.55	16.95
2005	34	4	16.61	0.80	17.08	15.93	15.95	17.50
2006	34	4	17.37	0.50	16.78	17.96	17.19	17.54

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	26.21	0.29	26.05	26.54	25.90	26.35		
2002	35	4	17.93	0.38	18.23	17.39	17.92	18.17		
2003	35	4	15.68	0.64	16.51	14.99	15.42	15.79		
2004	35	4	16.34	0.35	16.58	15.95	16.13	16.68		
2005	35	4	16.50	0.60	16.39	16.96	15.70	16.94		
2006	35	4	16.20	0.16	16.23	15.97	16.29	16.31		
2001	36	4	28.28	0.25	28.45	28.06	28.07	28.53		
2002	36	4	18.97	0.30	18.80	18.91	18.77	19.41		
2003	36	4	16.27	0.22	16.29	15.96	16.34	16.47		
2004	36	4	17.34	0.45	17.10	17.89	16.87	17.50		
2005	36	4	17.15	0.49	16.74	17.05	16.95	17.85		
2006	36	4	16.84	0.20	17.00	16.56	16.95	16.84		
2001	37	6	28.28	0.67	29.14	27.80	28.30	28.94	28.15	27.38
2002	37	6	17.19	0.32	17.16	17.26	16.72	16.95	17.64	17.38
2003	37	6	14.54	0.30	14.83	14.39	14.46	14.44	14.96	14.14
2004	37	6	14.35	0.31	14.37	14.79	14.53	13.93	14.39	14.07
2005	37	6	14.91	0.29	15.10	14.70	14.56	14.76	15.32	15.04
2006	37	6	15.31	0.40	15.19	15.10	15.31	15.03	15.13	16.11
2001	38	4	27.38	0.68	27.32	26.48	28.09	27.65		
2002	38	4	19.36	0.83C	18.76	18.55	20.20	19.94		
2003	38	4	17.16	0.45	17.62	17.48	16.75	16.78		
2004	38	4	16.76	0.54	17.49	16.87	16.42	16.28		
2005	38	4	16.33	0.91	17.10	15.16	16.06	17.00		
2006	38	4	18.00	1.42C	17.45	16.66	17.92	19.98		
2001	40	4	27.21	1.01C	26.06	28.27	27.82	26.70		
2002	40	4	17.87	0.49	17.86	17.51	17.54	18.56		
2003	40	4	15.94	0.67	15.54	16.36	16.63	15.21		
2004	40	4	16.05	0.80	15.01	16.94	15.96	16.27		
2005	40	4	15.84	0.79	14.97	16.73	15.42	16.23		
2006	40	4	16.37	1.17C	14.85	17.39	16.06	17.18		
2001	113	4	27.20	0.06	27.12	27.26	27.23	27.18		
2002	113	4	15.76	0.10	15.87	15.78	15.78	15.63		
2003	113	5	14.97	0.49	15.05	15.28	15.12	15.28	14.11	
2004	113	5	13.49	0.06	13.50	13.49	13.59	13.42	13.47	
2005	113	5	14.70	0.05	14.67	14.65	14.73	14.77	14.67	
2006	113	5	15.30	0.09	15.34	15.26	15.18	15.31	15.44	
2001	137	6	28.40	0.74	29.46	27.81	28.43	28.99	28.23	27.47
2002	137	6	17.32	0.47	17.28	17.66	16.64	16.89	17.79	17.64
2003	137	6	14.72	0.31	15.18	14.68	14.74	14.53	14.91	14.27
2004	137	6	14.46	0.38	14.24	15.02	14.74	13.92	14.43	14.44
2005	137	6	15.00	0.26	15.19	14.87	14.66	14.82	15.32	15.16
2006	137	6	15.36	0.47	15.34	14.82	15.40	15.10	15.27	16.22

18.4 Rohfett / XL

18.4.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-0.72	-0.46	-0.56	-0.49	-0.59	-0.05
3	0.49	0.25	-0.35	0.00	-0.09	-0.18
5	-0.76	-0.55	-0.38	-0.76	-0.65	-0.55
6	-0.12	-0.44	-0.34	-0.45	0.03	-0.31
7	0.29	0.61	0.64	0.26	0.19	0.62
8	0.24	0.49	0.71	0.78	0.89	0.82
9	0.61	0.69	0.07	0.67	0.10	0.22
10	0.24	0.10	0.25	0.34	0.19	0.14
13	-0.47	-0.14	-0.59	-0.47	-0.53	-0.51
14	0.31	0.19	0.16	-0.76	-0.18	0.13
15	0.51	0.12	0.00	0.47	0.13	1.27
17	-0.29	-0.69	-0.08	-0.66	-0.43	-0.17
18	0.10	-0.03	-0.36	0.03	0.15	0.05
19	0.04	-0.07	-0.34	0.07	0.13	0.06
20	-0.15	-0.27	-0.72	-0.33	-0.20	-0.17
22	0.58	1.15	1.01	1.34	1.23	1.50
23	0.55	0.05	0.47	0.26	0.20	0.20
24	0.31	0.05	0.04	-0.01	0.01	0.19
25	-0.13	-0.26	-0.36	-0.19	-0.35	-0.37
26	0.35	-0.15	0.32	-0.14	-0.25	-0.45
27	-0.18	-0.17	-0.17	-0.00	-0.21	0.11
28	0.15	0.09	0.19	0.16	0.14	0.16
29	-0.52	-0.29	0.17	0.19	0.34	-0.90
30	-0.04	0.60	0.88	2.05	1.21	1.86
31	0.56	0.23	-0.16	0.19	-0.53	-0.30
32	-0.91	-0.70	-0.29	-0.56	-0.84	-0.70
33	-1.02	-0.88	-0.60	-0.65	-0.64	-0.58
34	0.13	0.50	0.29	0.64	0.55	0.41
35	0.28	0.16	0.43	-0.23	-0.21	-0.07
36	0.30	0.56	0.64	0.42	0.36	0.44
37	-0.58	-0.58	-0.34	-0.21	-0.22	0.08
38	0.46	0.52	0.42	0.59	0.47	0.33
40	0.59	0.16	0.25	0.05	0.32	0.28
113	-0.60	-0.21	-0.84	-0.40	-0.49	-0.27
137	-0.60	-0.62	-0.46	-0.15	-0.24	0.08

18.4.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	1.69	0.07	1.77	1.70	1.61	1.66
2002	1	4	2.52	0.04	2.51	2.53	2.46	2.56
2003	1	4	2.54	0.02	2.53	2.56	2.53	2.56
2004	1	4	2.65	0.03	2.64	2.67	2.62	2.68
2005	1	4	2.54	0.06	2.54	2.45	2.61	2.55
2006	1	4	2.85	0.09	2.98	2.83	2.77	2.83
2001	3	4	2.05	0.08	2.07	1.98	2.00	2.15
2002	3	4	2.73	0.06	2.65	2.74	2.79	2.74
2003	3	4	2.61	0.04	2.56	2.63	2.60	2.64

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	2.80	0.04	2.76	2.83	2.77	2.84
2005	3	4	2.69	0.04	2.64	2.72	2.73	2.67
2006	3	4	2.81	0.07	2.81	2.84	2.73	2.88
2001	5	4	1.67	0.04	1.66	1.68	1.63	1.72
2002	5	4	2.49	0.04	2.50	2.46	2.55	2.45
2003	5	4	2.60	0.06	2.69	2.60	2.57	2.54
2004	5	4	2.57	0.07	2.64	2.47	2.60	2.57
2005	5	4	2.52	0.02	2.55	2.53	2.51	2.50
2006	5	4	2.71	0.05	2.71	2.77	2.65	2.70
2001	6	4	1.87	0.06	1.84	1.79	1.92	1.91
2002	6	4	2.52	0.06	2.46	2.58	2.48	2.57
2003	6	4	2.61	0.06	2.65	2.55	2.58	2.67
2004	6	4	2.66	0.03	2.64	2.66	2.71	2.65
2005	6	4	2.72	0.08	2.65	2.82	2.67	2.75
2006	6	4	2.78	0.08	2.83	2.80	2.66	2.82
2001	7	4	1.99	0.04	1.96	1.97	1.99	2.05
2002	7	4	2.84	0.12	2.77	3.02	2.74	2.82
2003	7	4	2.91	0.09	3.04	2.84	2.89	2.86
2004	7	4	2.88	0.17C	2.64	2.87	2.98	3.02
2005	7	4	2.77	0.04	2.74	2.75	2.76	2.84
2006	7	4	3.06	0.09	3.02	2.95	3.12	3.14
2001	8	4	1.98	0.07	1.95	1.93	2.08	1.95
2002	8	4	2.80	0.02	2.80	2.78	2.83	2.79
2003	8	4	2.93	0.08	2.85	2.90	2.91	3.04
2004	8	4	3.03	0.04	3.03	3.08	3.04	2.98
2005	8	4	2.98	0.07	2.93	2.93	3.00	3.07
2006	8	4	3.11	0.06	3.20	3.12	3.06	3.07
2001	9	4	2.09	0.05	2.04	2.04	2.15	2.11
2002	9	4	2.86	0.10	2.79	2.91	2.97	2.77
2003	9	4	2.74	0.05	2.81	2.73	2.73	2.68
2004	9	4	3.00	0.08	3.08	2.99	2.89	3.04
2005	9	4	2.75	0.12	2.66	2.93	2.69	2.70
2006	9	4	2.93	0.14	2.80	3.08	2.82	3.04
2001	10	4	1.97	0.06	2.01	1.96	2.03	1.90
2002	10	4	2.69	0.04	2.66	2.67	2.74	2.67
2003	10	4	2.79	0.02	2.78	2.77	2.77	2.82
2004	10	4	2.90	0.02	2.90	2.88	2.93	2.90
2005	10	4	2.77	0.04	2.79	2.73	2.81	2.76
2006	10	4	2.91	0.06	2.89	2.89	3.00	2.87
2001	13	4	1.76	0.02	1.77	1.75	1.78	1.74
2002	13	4	2.61	0.02	2.63	2.62	2.59	2.61
2003	13	4	2.54	0.03	2.58	2.55	2.50	2.51
2004	13	4	2.66	0.01	2.66	2.67	2.65	2.65
2005	13	4	2.56	0.03	2.59	2.56	2.52	2.56
2006	13	4	2.71	0.03	2.74	2.73	2.71	2.68
2001	14	4	2.00	0.07	2.07	2.04	1.91	1.97
2002	14	4	2.71	0.08	2.81	2.75	2.63	2.66
2003	14	4	2.76	0.03	2.77	2.80	2.75	2.73
2004	14	4	2.57	0.11	2.66	2.48	2.68	2.48
2005	14	4	2.66	0.05	2.67	2.73	2.64	2.62
2006	14	4	2.91	0.09	2.98	2.78	2.96	2.92
2001	15	4	2.06	0.08	2.17	2.03	2.00	2.02
2002	15	4	2.69	0.05	2.73	2.65	2.64	2.75

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	2.71	0.13	2.88	2.75	2.62	2.61
2004	15	4	2.94	0.03	2.93	2.95	2.91	2.97
2005	15	4	2.76	0.11	2.79	2.64	2.89	2.70
2006	15	4	3.25	0.32C	3.73	3.16	3.08	3.04
2001	17	4	1.82	0.10	1.92	1.78	1.88	1.69
2002	17	4	2.45	0.08	2.44	2.52	2.35	2.50
2003	17	4	2.69	0.08	2.60	2.67	2.81	2.68
2004	17	4	2.60	0.07	2.53	2.69	2.61	2.58
2005	17	4	2.59	0.09	2.53	2.60	2.50	2.71
2006	17	4	2.82	0.08	2.83	2.92	2.77	2.75
2001	18	4	1.93	0.02	1.93	1.95	1.91	1.94
2002	18	4	2.65	0.07	2.71	2.56	2.70	2.61
2003	18	4	2.61	0.13	2.50	2.70	2.49	2.74
2004	18	4	2.81	0.05	2.84	2.83	2.83	2.73
2005	18	4	2.76	0.08	2.64	2.79	2.81	2.80
2006	18	4	2.88	0.06	2.92	2.80	2.93	2.88
2001	19	4	1.91	0.03	1.88	1.92	1.90	1.96
2002	19	4	2.63	0.08	2.73	2.54	2.67	2.60
2003	19	4	2.61	0.10	2.50	2.68	2.55	2.72
2004	19	4	2.82	0.04	2.84	2.86	2.81	2.77
2005	19	4	2.75	0.06	2.67	2.78	2.75	2.82
2006	19	4	2.89	0.07	2.91	2.79	2.94	2.91
2001	20	4	1.86	0.03	1.86	1.89	1.81	1.87
2002	20	4	2.57	0.08	2.65	2.48	2.64	2.53
2003	20	4	2.50	0.13	2.38	2.61	2.39	2.60
2004	20	4	2.70	0.04	2.75	2.69	2.72	2.65
2005	20	4	2.66	0.08	2.54	2.71	2.65	2.72
2006	20	4	2.82	0.04	2.81	2.77	2.83	2.85
2001	22	4	2.08	0.11	1.93	2.17	2.16	2.04
2002	22	4	3.00	0.06	2.96	2.98	2.97	3.09
2003	22	4	3.02	0.07	2.94	3.10	2.99	3.04
2004	22	4	3.20	0.10	3.21	3.34	3.15	3.11
2005	22	4	3.09	0.02	3.10	3.10	3.07	3.07
2006	22	0	3.32B	0.08	3.27	3.42	3.25	3.33
2001	23	4	2.07	0.07	2.03	2.05	2.17	2.02
2002	23	4	2.67	0.08	2.77	2.58	2.70	2.63
2003	23	4	2.85	0.10	2.95	2.83	2.72	2.92
2004	23	4	2.88	0.09	2.99	2.91	2.76	2.86
2005	23	4	2.77	0.17	2.54	2.90	2.89	2.77
2006	23	4	2.93	0.09	2.85	3.02	2.99	2.86
2001	24	4	2.00	0.03	2.02	1.99	2.01	1.96
2002	24	4	2.67	0.06	2.64	2.63	2.76	2.64
2003	24	4	2.73	0.03	2.76	2.73	2.70	2.71
2004	24	4	2.80	0.06	2.73	2.85	2.85	2.75
2005	24	4	2.72	0.07	2.80	2.65	2.68	2.74
2006	24	4	2.93	0.05	3.00	2.93	2.90	2.87
2001	25	4	1.86	0.02	1.89	1.86	1.83	1.87
2002	25	4	2.58	0.02	2.56	2.56	2.59	2.61
2003	25	4	2.61	0.08	2.60	2.52	2.60	2.71
2004	25	4	2.74	0.07	2.70	2.67	2.78	2.82
2005	25	4	2.61	0.06	2.69	2.54	2.59	2.63
2006	25	4	2.76	0.06	2.76	2.79	2.67	2.81
2001	26	4	2.01	0.07	2.07	1.93	1.97	2.07

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	2.61	0.07	2.55	2.67	2.55	2.67
2003	26	4	2.81	0.05	2.79	2.76	2.80	2.89
2004	26	4	2.76	0.06	2.69	2.81	2.74	2.79
2005	26	4	2.64	0.09	2.70	2.51	2.69	2.66
2006	26	4	2.73	0.10	2.74	2.64	2.70	2.86
2001	27	4	1.85	0.04	1.79	1.87	1.87	1.87
2002	27	4	2.60	0.11	2.54	2.76	2.55	2.56
2003	27	4	2.66	0.03	2.67	2.63	2.64	2.71
2004	27	4	2.80	0.11	2.93	2.74	2.84	2.69
2005	27	4	2.65	0.03	2.68	2.67	2.64	2.62
2006	27	4	2.90	0.01	2.91	2.89	2.90	2.91
2001	28	4	1.95	0.02	1.94	1.95	1.93	1.97
2002	28	4	2.68	0.00	2.68	2.68	2.68	2.68
2003	28	4	2.77	0.02	2.79	2.76	2.77	2.75
2004	28	4	2.85	0.08	2.89	2.80	2.94	2.77
2005	28	4	2.76	0.05	2.73	2.81	2.80	2.71
2006	28	4	2.92	0.08	2.98	2.89	2.82	2.99
2001	29	4	1.75	0.05	1.78	1.79	1.69	1.73
2002	29	4	2.57	0.03	2.57	2.57	2.60	2.53
2003	29	4	2.76	0.10	2.69	2.86	2.66	2.85
2004	29	4	2.86	0.04	2.81	2.86	2.90	2.85
2005	29	4	2.82	0.11	2.83	2.88	2.66	2.91
2006	29	3	2.60	0.19	2.76	2.65	2.38	
2001	30	4	1.89	0.02	1.91	1.88	1.86	1.91
2002	30	4	2.83	0.01	2.84	2.83	2.85	2.82
2003	30	4	2.98	0.01	2.97	2.99	2.99	2.96
2004	30	0	3.42B	0.03	3.43	3.43	3.37	3.43
2005	30	4	3.08	0.04	3.05	3.13	3.08	3.05
2006	30	0	3.43B	0.03	3.46	3.43	3.44	3.39
2001	31	4	2.07	0.46C	2.74	1.94	1.71	1.90
2002	31	4	2.72	0.16	2.67	2.59	2.95	2.68
2003	31	4	2.67	0.03	2.66	2.63	2.67	2.71
2004	31	4	2.86	0.14	3.06	2.76	2.81	2.79
2005	31	4	2.56	0.17	2.45	2.75	2.40	2.63
2006	31	4	2.78	0.28C	2.70	2.56	3.19	2.66
2001	32	4	1.63	0.15 c	1.70	1.75	1.40	1.66
2002	32	4	2.44	0.05	2.49	2.47	2.38	2.43
2003	32	4	2.63	0.06	2.62	2.57	2.60	2.71
2004	32	4	2.63	0.07	2.73	2.57	2.61	2.62
2005	32	4	2.46	0.03	2.46	2.43	2.46	2.51
2006	32	4	2.66	0.09	2.67	2.55	2.77	2.63
2001	33	4	1.60	0.07	1.60	1.50	1.65	1.64
2002	33	4	2.39	0.16	2.45	2.17	2.55	2.40
2003	33	4	2.53	0.04	2.57	2.51	2.49	2.56
2004	33	4	2.61	0.04	2.60	2.66	2.59	2.57
2005	33	4	2.53	0.10	2.61	2.57	2.39	2.53
2006	33	4	2.69	0.09	2.75	2.79	2.59	2.65
2001	34	4	1.94	0.07	1.96	2.04	1.88	1.90
2002	34	4	2.80	0.06	2.75	2.88	2.80	2.78
2003	34	4	2.80	0.05	2.85	2.81	2.82	2.73
2004	34	4	2.99	0.04	2.99	2.99	3.04	2.95
2005	34	4	2.88	0.14	2.80	3.09	2.78	2.87
2006	34	4	2.99	0.16	2.92	3.23	2.94	2.88

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	1.99	0.06	2.04	1.90	2.01	1.99		
2002	35	4	2.70	0.10	2.79	2.60	2.78	2.64		
2003	35	4	2.84	0.12	2.67	2.95	2.88	2.88		
2004	35	4	2.73	0.06	2.67	2.82	2.71	2.72		
2005	35	4	2.65	0.06	2.63	2.71	2.69	2.58		
2006	35	4	2.85	0.09	2.77	2.98	2.83	2.81		
2001	36	4	1.99	0.07	1.96	2.02	1.91	2.08		
2002	36	4	2.82	0.05	2.79	2.81	2.79	2.89		
2003	36	4	2.91	0.03	2.90	2.94	2.86	2.93		
2004	36	4	2.93	0.03	2.95	2.90	2.95	2.91		
2005	36	4	2.83	0.08	2.73	2.80	2.93	2.84		
2006	36	4	3.00	0.12	2.98	3.11	3.06	2.85		
2001	37	6	1.73	0.05	1.65	1.81	1.73	1.72	1.72	1.76
2002	37	6	2.48	0.07	2.46	2.57	2.54	2.39	2.44	2.49
2003	37	6	2.61	0.06	2.50	2.64	2.67	2.63	2.64	2.59
2004	37	6	2.74	0.05	2.70	2.73	2.72	2.73	2.83	2.72
2005	37	6	2.65	0.07	2.55	2.64	2.60	2.68	2.75	2.67
2006	37	6	2.89	0.08	2.87	2.93	3.02	2.80	2.93	2.80
2001	38	4	2.04	0.03	2.03	2.02	2.08	2.02		
2002	38	4	2.81	0.04	2.83	2.81	2.85	2.76		
2003	38	4	2.84	0.05	2.90	2.81	2.85	2.79		
2004	38	4	2.98	0.02	2.95	3.01	2.97	2.98		
2005	38	4	2.86	0.16	2.79	3.10	2.75	2.79		
2006	38	4	2.97	0.17	2.83	3.21	2.87	2.96		
2001	40	4	2.08	0.14	2.21	1.89	2.04	2.18		
2002	40	4	2.70	0.15	2.64	2.69	2.91	2.57		
2003	40	4	2.79	0.14	2.98	2.80	2.67	2.71		
2004	40	4	2.81	0.20C	2.98	2.52	2.91	2.85		
2005	40	4	2.81	0.18	3.01	2.69	2.92	2.63		
2006	40	4	2.95	0.15	3.18	2.85	2.92	2.86		
2001	113	4	1.72	0.01	1.73	1.73	1.71	1.73		
2002	113	4	2.59	0.03	2.57	2.58	2.58	2.63		
2003	113	5	2.46	0.11	2.43	2.42	2.40	2.41	2.65	
2004	113	5	2.68	0.01	2.70	2.68	2.67	2.68	2.67	
2005	113	5	2.57	0.02	2.59	2.57	2.56	2.54	2.58	
2006	113	5	2.79	0.02	2.78	2.81	2.80	2.78	2.77	
2001	137	6	1.72	0.05	1.69	1.80	1.65	1.72	1.74	1.73
2002	137	6	2.47	0.07	2.48	2.52	2.55	2.35	2.45	2.47
2003	137	6	2.57	0.07	2.46	2.58	2.65	2.60	2.61	2.56
2004	137	6	2.76	0.04	2.76	2.74	2.74	2.76	2.83	2.71
2005	137	6	2.64	0.07	2.54	2.71	2.58	2.65	2.73	2.65
2006	137	6	2.89	0.08	2.87	2.93	3.01	2.79	2.94	2.83

18.5 Stärke / XS

18.5.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	0.44	0.78	0.43	0.70	0.85	0.04
3	1.07	0.50	0.68	0.54	0.83	0.12
5	-1.02	-0.51	-0.81	-1.39	-0.47	-0.53
6	0.29	-0.49	-0.99	-0.86	-0.94	-0.27
7	0.47	-0.21	-0.34	-0.36	0.16	-0.62
8	0.88	0.87	1.30	1.15	1.21	1.24
9	-0.07	-0.31	-0.23	-0.33	-0.24	-0.27
10	0.43	0.51	0.02	-0.01	0.05	-0.11
13	-0.69	-0.29	0.22	0.16	-1.03	0.07
14	0.50	0.44	0.35	1.17	0.62	0.49
15	-0.07	-0.62	-0.53	-0.53	-0.55	0.38
17	-0.10	-2.48	-2.23	-2.16	-1.79	-1.50
18	0.40	0.33	0.61	0.22	0.02	0.77
19	0.55	0.58	0.72	0.38	0.11	0.83
20	0.87	0.93	1.48	1.05	0.89	1.28
22	-2.05	-1.60	-0.97	-1.16	-0.99	-1.26
23	0.01	-0.68	-0.53	-0.84	-0.92	-0.87
24	-0.14	0.45	0.04	0.17	0.08	-0.16
25	0.17	0.82	1.18	0.97	1.03	1.39
26	0.58	-0.33	-0.95	-1.37	-0.88	-0.56
27	-0.42	-0.28	0.05	-0.16	0.33	-0.20
28	0.12	0.10	-0.24	0.24	0.14	0.04
29	0.23	0.35	0.28	0.59	-0.83	-1.22
30	-0.92	-0.82	-1.66	0.81	0.13	-1.15
31	0.44	-0.35	-0.78	-0.96	-0.47	-0.87
32	0.49	0.12	-0.19	-0.67	-0.38	-0.93
33	2.04	1.40	0.84	1.08	1.44	1.65
34	-1.27	-1.04	-0.44	-0.85	-0.72	-0.58
35	0.73	-0.20	-0.05	-0.33	-0.43	0.30
36	-0.95	-0.76	-0.32	-1.03	-0.63	0.06
37	-1.20	1.15	1.77	1.85	1.76	1.62
38	-0.55	-1.26	-0.84	-1.03	-0.59	-1.16
40	-0.28	-0.17	-0.43	-0.77	-0.26	-0.39
113	0.16	1.78	0.68	1.87	0.72	0.64
137	-1.13	1.29	1.87	1.86	1.76	1.72

18.5.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	8.54	0.37	8.45	8.40	9.08	8.24
2002	1	4	33.21	0.33	33.27	33.41	33.41	32.72
2003	1	4	38.31	0.10	38.38	38.39	38.19	38.27
2004	1	4	38.18	0.35	37.72	38.59	38.19	38.21
2005	1	4	39.25	1.63 c	37.82	41.35	38.11	39.72
2006	1	4	36.18	0.43	36.20	36.48	36.49	35.57
2001	3	4	9.80	0.30	10.16	9.75	9.85	9.43
2002	3	4	32.63	0.47	33.34	32.34	32.49	32.36
2003	3	4	38.82	0.27	38.75	38.82	39.18	38.53

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	37.86	0.13	37.74	37.80	38.03	37.87
2005	3	4	39.21	0.34	39.71	39.17	38.95	39.02
2006	3	4	36.34	0.52	35.94	37.06	36.40	35.97
2001	5	4	5.61	0.28	5.84	5.34	5.86	5.38
2002	5	4	30.62	0.41	30.27	30.56	30.42	31.21
2003	5	4	35.83	0.26	35.73	35.55	36.16	35.88
2004	5	4	34.01	0.34	33.87	33.71	33.94	34.50
2005	5	4	36.62	0.25	36.62	36.38	36.50	36.97
2006	5	4	35.05	0.29	35.00	35.07	34.71	35.41
2001	6	4	8.23	0.46	8.49	8.72	7.96	7.73
2002	6	4	30.66	0.17	30.81	30.72	30.69	30.42
2003	6	4	35.47	0.46	35.91	35.76	35.35	34.87
2004	6	4	35.06	0.64	35.53	34.12	35.32	35.26
2005	6	4	35.69	0.68	36.69	35.26	35.33	35.46
2006	6	4	35.55	0.41	35.20	35.63	36.10	35.28
2001	7	4	8.60	1.02	7.92	7.60	9.13	9.77
2002	7	4	31.22	0.81	31.73	30.02	31.44	31.68
2003	7	4	36.77	0.33	36.55	36.48	36.86	37.20
2004	7	4	36.05	1.04	35.09	35.98	37.51	35.63
2005	7	4	37.88	0.42	37.26	38.01	38.18	38.08
2006	7	4	34.87	0.41	34.33	35.31	34.86	34.98
2001	8	4	9.41	0.06	9.40	9.48	9.44	9.33
2002	8	4	33.39	0.42	33.05	33.30	33.20	33.99
2003	8	4	40.07	0.61	39.28	40.11	40.77	40.10
2004	8	4	39.08	0.50	39.39	38.34	39.21	39.39
2005	8	4	39.98	0.27	40.29	39.93	40.07	39.65
2006	8	4	38.59	0.64	38.73	39.34	37.80	38.48
2001	9	4	7.51	0.43	7.17	7.21	7.59	8.09
2002	9	4	31.02	0.52	31.00	31.28	30.30	31.50
2003	9	4	37.00	0.53	36.60	36.52	37.60	37.28
2004	9	4	36.12	0.42	36.12	35.53	36.49	36.33
2005	9	4	37.07	0.25	36.75	37.00	37.20	37.32
2006	9	4	35.55	0.65	36.38	34.91	35.72	35.20
2001	10	4	8.52	0.32	8.55	8.75	8.73	8.06
2002	10	4	32.66	0.39	33.00	32.98	32.42	32.24
2003	10	4	37.49	0.59	37.61	38.22	36.79	37.35
2004	10	4	36.75	0.06	36.71	36.81	36.79	36.70
2005	10	4	37.67	0.10	37.71	37.53	37.78	37.64
2006	10	4	35.88	0.34	36.13	35.58	35.59	36.21
2001	13	4	6.28	0.03	6.31	6.29	6.29	6.23
2002	13	4	31.06	0.09	31.17	31.09	31.02	30.97
2003	13	4	37.91	0.10	37.84	37.91	37.84	38.04
2004	13	4	37.10	0.07	37.17	37.01	37.08	37.12
2005	13	4	35.49	0.04	35.52	35.45	35.52	35.48
2006	13	4	36.24	0.08	36.21	36.16	36.35	36.24
2001	14	4	8.65	0.59	7.95	9.33	8.87	8.45
2002	14	4	32.53	0.70	32.20	33.46	31.84	32.62
2003	14	4	38.17	0.74	39.02	38.34	37.23	38.09
2004	14	4	39.12	0.35	39.06	38.87	38.93	39.62
2005	14	4	38.80	0.51	38.08	38.87	39.01	39.26
2006	14	4	37.07	0.77	37.80	37.48	36.03	36.99
2001	15	4	7.51	0.58	6.68	7.70	8.04	7.61
2002	15	4	30.41	0.54	29.96	30.09	30.43	31.16

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	36.40	1.04	36.09	37.91	35.56	36.02
2004	15	4	35.71	0.90	34.82	36.83	35.18	36.01
2005	15	4	36.46	0.39	36.39	36.45	36.97	36.02
2006	15	4	36.86	1.15	38.19	37.46	35.86	35.93
2001	17	4	7.45	0.42	7.71	6.83	7.61	7.65
2002	17	4	26.68	0.36	27.10	26.33	26.86	26.44
2003	17	4	33.00	0.46	33.59	32.82	32.50	33.09
2004	17	4	32.45	0.34	32.34	32.41	32.12	32.92
2005	17	4	33.98	0.61	33.65	34.86	33.87	33.53
2006	17	4	33.11	0.67	33.37	32.61	33.93	32.52
2001	18	4	8.45	0.79	8.13	8.26	7.81	9.59
2002	18	4	32.30	0.35	32.34	32.51	31.79	32.56
2003	18	4	38.69	0.70	39.24	38.33	39.31	37.87
2004	18	4	37.23	1.01	37.60	38.43	36.77	36.10
2005	18	4	37.59	0.16	37.35	37.68	37.70	37.62
2006	18	4	37.63	1.07	37.54	38.25	36.16	38.59
2001	19	4	8.76	0.91	8.69	8.39	7.93	10.05
2002	19	4	32.79	0.40	32.81	33.14	32.23	33.00
2003	19	4	38.90	0.58	39.47	38.70	39.25	38.17
2004	19	4	37.54	0.76	37.83	38.46	37.04	36.81
2005	19	4	37.78	0.10	37.69	37.90	37.71	37.81
2006	19	4	37.75	1.11	37.62	38.31	36.27	38.82
2001	20	4	9.41	1.10	9.25	8.73	8.64	11.00
2002	20	4	33.50	0.28	33.24	33.73	33.28	33.74
2003	20	4	40.43	1.13	41.46	40.20	41.11	38.94
2004	20	4	38.88	1.08	39.16	40.16	38.62	37.58
2005	20	4	39.34	0.41	39.66	39.38	39.56	38.75
2006	20	4	38.65	1.17	38.12	39.21	37.31	39.97
2001	22	4	3.56	0.35	3.76	3.83	3.59	3.06
2002	22	4	28.44	0.15	28.51	28.35	28.28	28.62
2003	22	4	35.52	0.52	36.22	35.49	34.98	35.41
2004	22	4	34.46	0.21	34.70	34.53	34.20	34.41
2005	22	4	35.58	0.92	35.67	34.34	35.78	36.55
2006	22	4	33.58	0.49	34.31	33.31	33.45	33.26
2001	23	4	7.68	0.64	7.84	6.79	7.76	8.32
2002	23	4	30.27	0.20	30.32	30.17	30.07	30.53
2003	23	4	36.41	1.48	37.19	35.24	35.11	38.10
2004	23	4	35.10	0.52	34.79	35.32	35.71	34.57
2005	23	4	35.71	0.70	35.18	36.49	36.12	35.05
2006	23	4	34.37	0.98	35.13	34.87	32.94	34.54
2001	24	4	7.37	0.17	7.40	7.12	7.49	7.45
2002	24	4	32.55	0.20	32.64	32.59	32.26	32.69
2003	24	4	37.54	0.41	38.00	37.63	37.54	37.00
2004	24	4	37.12	0.36	36.85	37.14	36.88	37.63
2005	24	4	37.72	0.20	37.81	37.49	37.63	37.94
2006	24	4	35.79	0.29	35.89	35.41	36.11	35.75
2001	25	4	8.00	0.12	7.84	8.14	8.00	8.02
2002	25	4	33.27	0.30	33.35	33.20	33.63	32.91
2003	25	4	39.82	0.81	40.44	39.41	38.87	40.55
2004	25	4	38.71	0.49	38.63	38.71	38.15	39.35
2005	25	4	39.63	0.98	39.25	41.07	38.86	39.31
2006	25	4	38.88	0.99	38.01	38.96	40.23	38.30
2001	26	4	8.81	0.35	9.25	8.93	8.47	8.57

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	30.98	0.47	30.34	31.47	31.05	31.05
2003	26	4	35.56	2.12C	34.52	33.08	37.19	37.45
2004	26	4	34.04	0.33	33.74	33.77	34.34	34.33
2005	26	4	35.80	1.02	34.90	36.86	34.95	36.48
2006	26	4	34.98	0.96	33.76	34.71	35.51	35.93
2001	27	4	6.81	0.27	6.42	6.91	6.90	7.02
2002	27	4	31.08	0.44	31.10	30.67	30.86	31.69
2003	27	4	37.55	0.27	37.55	37.89	37.53	37.23
2004	27	4	36.45	0.30	36.45	36.88	36.22	36.27
2005	27	4	38.22	0.31	38.48	38.28	37.78	38.36
2006	27	4	35.70	0.79	35.82	34.78	36.69	35.52
2001	28	4	7.89	0.57	8.00	7.17	7.84	8.56
2002	28	4	31.85	0.11	31.91	31.92	31.89	31.68
2003	28	4	36.97	1.21	38.26	37.31	35.36	36.96
2004	28	4	37.26	1.04	37.07	36.81	36.41	38.77
2005	28	4	37.83	0.78	37.81	38.26	36.74	38.51
2006	28	4	36.19	0.35	35.70	36.38	36.17	36.50
2001	29	4	8.11	0.63	8.46	7.58	7.57	8.82
2002	29	4	32.35	0.83	32.79	32.74	32.75	31.11
2003	29	4	38.02	0.82	39.06	37.80	38.13	37.08
2004	29	4	37.96	0.66	37.02	38.37	37.98	38.48
2005	29	4	35.89	1.56	36.83	37.25	35.72	33.75
2006	29	3	33.67	0.87	34.03	34.30	32.67	
2001	30	4	5.82	0.20	5.84	5.85	5.54	6.03
2002	30	4	30.00	0.22	30.17	29.94	29.72	30.16
2003	30	4	34.15	0.37	33.83	34.55	33.83	34.39
2004	30	4	38.41	0.36	38.67	38.64	37.89	38.42
2005	30	4	37.82	0.34	37.31	38.05	37.94	37.97
2006	30	4	33.80	0.40	33.73	34.19	33.27	34.02
2001	31	4	8.54	1.24	9.99	8.89	7.01	8.26
2002	31	4	30.95	0.67	31.05	31.39	31.39	29.97
2003	31	4	35.91	0.27	35.60	35.78	36.05	36.19
2004	31	4	34.86	0.42	35.49	34.62	34.66	34.68
2005	31	4	36.62	0.53	36.37	36.79	37.26	36.04
2006	31	4	34.37	0.78	33.66	34.18	35.48	34.14
2001	32	4	8.63	0.69	9.03	8.88	7.59	9.01
2002	32	4	31.88	0.80	32.17	32.45	30.69	32.19
2003	32	4	37.07	0.36	36.97	37.44	36.61	37.27
2004	32	4	35.43	0.30	35.69	35.57	35.47	35.00
2005	32	4	36.80	0.66	36.59	36.91	37.65	36.07
2006	32	4	34.25	0.53	33.54	34.15	34.59	34.70
2001	33	4	11.74	0.30	12.00	11.98	11.41	11.55
2002	33	4	34.45	0.63	33.66	35.02	34.89	34.23
2003	33	4	39.13	1.36	39.12	37.22	39.94	40.24
2004	33	4	38.93	0.77	38.78	39.21	39.79	37.95
2005	33	4	40.44	0.63	40.73	40.58	39.52	40.93
2006	33	4	39.41	1.56	41.48	39.30	37.70	39.15
2001	34	4	5.12	0.74	5.33	4.36	4.73	6.06
2002	34	4	29.57	0.53	29.64	30.25	29.40	28.98
2003	34	4	36.58	0.64	35.99	36.07	37.20	37.08
2004	34	4	35.09	1.03	34.35	34.48	36.59	34.94
2005	34	4	36.12	0.90	36.18	36.84	36.62	34.83
2006	34	4	34.94	1.24	35.83	33.13	35.67	35.12

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	9.12	0.32	8.93	9.08	9.59	8.89		
2002	35	4	31.24	1.36 c	30.27	33.26	30.64	30.80		
2003	35	4	37.35	0.49	37.10	37.65	37.86	36.80		
2004	35	4	36.11	0.49	36.30	36.52	36.24	35.40		
2005	35	4	36.69	0.90	37.05	35.50	37.62	36.58		
2006	35	4	36.70	0.06	36.76	36.64	36.72	36.66		
2001	36	4	5.76	0.53	5.43	6.30	6.13	5.19		
2002	36	4	30.11	0.74	30.80	30.12	30.45	29.08		
2003	36	4	36.82	0.59	36.69	36.13	36.90	37.58		
2004	36	4	34.71	0.23	34.98	34.53	34.82	34.52		
2005	36	4	36.29	0.74	36.76	36.91	36.24	35.27		
2006	36	4	36.22	0.58	35.36	36.52	36.44	36.56		
2001	37	6	5.25	0.84	4.48	5.48	5.53	4.12	5.43	6.47
2002	37	6	33.94	0.83	34.15	32.91	34.79	34.95	33.23	33.60
2003	37	6	40.99	0.72	40.56	41.37	40.77	40.85	40.19	42.23
2004	37	6	40.47	0.59	41.09	39.91	39.74	41.13	40.30	40.65
2005	37	6	41.07	0.69	41.04	41.42	41.98	41.32	39.94	40.72
2006	37	6	39.33	0.67	39.96	39.32	38.73	40.28	39.05	38.64
2001	38	4	6.55	0.23	6.66	6.78	6.24	6.51		
2002	38	4	29.12	1.29	30.12	30.30	27.72	28.35		
2003	38	4	35.79	0.61	34.98	35.64	36.25	36.27		
2004	38	4	34.71	0.54	34.12	34.52	35.41	34.80		
2005	38	4	36.37	0.48	35.99	36.98	36.54	35.97		
2006	38	4	33.79	1.07	34.85	33.80	34.18	32.33		
2001	40	4	7.09	0.50	7.62	7.38	6.53	6.83		
2002	40	4	31.30	0.91	31.52	32.33	31.22	30.14		
2003	40	4	36.60	1.03	36.65	35.94	35.78	38.03		
2004	40	4	35.24	0.52	35.90	34.96	35.40	34.71		
2005	40	4	37.04	0.58	37.53	36.20	37.17	37.27		
2006	40	4	35.31	1.06	36.59	34.15	35.71	34.80		
2001	113	4	7.97	0.05	7.95	8.05	7.94	7.93		
2002	113	4	35.20	0.03	35.17	35.21	35.20	35.24		
2003	113	5	38.83	0.49	38.80	38.49	38.65	38.52	39.67	
2004	113	5	40.51	0.04	40.51	40.58	40.45	40.51	40.53	
2005	113	5	38.99	0.07	39.08	39.04	38.97	38.89	38.97	
2006	113	5	37.39	0.10	37.31	37.52	37.47	37.33	37.30	
2001	137	6	5.39	1.01	4.29	5.50	5.65	4.42	5.45	7.07
2002	137	6	34.21	1.00	34.49	33.06	35.44	35.27	33.37	33.65
2003	137	6	41.20	0.77	40.70	41.66	40.76	41.09	40.48	42.53
2004	137	6	40.49	0.62	41.03	39.73	39.84	41.28	40.50	40.60
2005	137	6	41.09	0.59	41.14	41.15	41.99	41.25	40.19	40.80
2006	137	6	39.53	0.91	40.29	40.40	38.76	40.26	39.21	38.28

18.6 Zucker / XZ

18.6.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-0.21	-0.30	-0.66	-0.72	-0.97	-0.13
3	-0.95	0.03	0.64	0.77	0.64	0.87
5	0.80	-0.33	-0.77	-0.38	-0.59	-0.54
6	0.13	-0.44	-0.33	-0.36	-0.34	-0.11
7	-2.47	-1.37	-1.44	-1.36	-1.33	-1.07
8	-0.39	1.66	0.96	1.25	1.45	1.25
9	-0.79	-0.52	-1.10	-0.55	-0.88	-0.75
10	0.14	0.15	0.01	-0.17	-0.13	-0.16
13	-0.94	0.10	-1.36	-0.40	-1.20	-0.23
14	-0.54	0.00	0.28	-0.95	-0.45	-0.33
15	1.51	1.07	0.46	1.04	1.04	1.04
17	1.38	2.67	1.72	1.91	1.17	2.20
18	-0.22	0.77	0.22	-0.08	0.50	0.19
19	-1.31	-0.18	-0.21	-0.75	0.05	-0.18
20	-0.25	0.51	-0.12	-0.52	0.04	0.19
22	3.12	3.67	2.88	3.14	3.06	3.52
23	-0.49	-0.01	0.37	0.07	-0.10	0.03
24	-0.26	-1.31	-1.68	-1.76	-1.58	-1.46
25	-0.57	-1.12	-1.10	-1.37	-1.19	-0.96
26	-1.28	-0.79	-0.06	-0.99	-0.72	-0.79
27	0.30	-0.09	-0.53	-0.24	-0.66	-0.23
28	-0.95	0.33	0.88	0.46	0.21	0.51
29	-1.51	-1.10	-0.48	-0.57	-0.50	-0.17
30	3.21	3.79	3.61	4.04	3.53	4.54
31	-1.69	-0.57	0.26	0.07	-0.34	-0.67
32	0.20	1.44	2.12	1.37	1.45	1.29
33	-7.51	-4.69	-3.05	-2.82	-2.85	-2.65
34	-0.39	-0.09	-1.37	-0.23	-0.65	-0.24
35	0.01	0.86	0.52	0.17	0.51	0.36
36	1.82	2.08	2.05	2.15	2.23	2.17
37	0.71	-0.19	-1.40	-1.44	-0.99	-0.48
38	0.14	0.93	0.62	1.24	0.84	1.35
40	0.68	0.37	-0.12	0.18	0.30	0.27
113	0.47	0.44	-0.26	-0.83	-0.51	0.02
137	0.62	-0.32	-1.57	-1.39	-1.06	-0.60

18.6.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	11.62	0.31	11.46	11.69	11.33	12.03
2002	1	4	8.28	0.12	8.36	8.11	8.34	8.31
2003	1	4	5.38	0.17	5.47	5.13	5.49	5.41
2004	1	4	6.31	0.10	6.45	6.25	6.29	6.25
2005	1	4	6.46	0.31	6.66	6.13	6.79	6.28
2006	1	4	7.04	0.27	7.19	6.88	6.77	7.34
2001	3	4	11.25	0.32	11.30	10.79	11.52	11.42
2002	3	4	8.45	0.16	8.34	8.63	8.52	8.30
2003	3	4	6.03	0.33	5.89	5.78	5.92	6.52

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	7.05	0.18	6.87	7.09	7.28	6.98
2005	3	4	7.27	0.22	7.23	7.03	7.27	7.55
2006	3	4	7.54	0.16	7.50	7.72	7.35	7.60
2001	5	4	12.13	0.09	12.19	12.03	12.08	12.23
2002	5	4	8.27	0.12	8.39	8.34	8.12	8.21
2003	5	4	5.32	0.07	5.31	5.43	5.28	5.28
2004	5	4	6.48	0.17	6.64	6.61	6.38	6.28
2005	5	4	6.66	0.06	6.71	6.69	6.64	6.58
2006	5	4	6.84	0.16	6.65	6.75	6.95	7.00
2001	6	4	11.80	0.12	11.65	11.79	11.82	11.94
2002	6	4	8.21	0.09	8.27	8.18	8.29	8.09
2003	6	4	5.54	0.10	5.62	5.47	5.64	5.45
2004	6	4	6.49	0.19	6.61	6.59	6.56	6.21
2005	6	4	6.78	0.10	6.64	6.87	6.83	6.78
2006	6	4	7.06	0.18	7.00	7.08	6.86	7.28
2001	7	4	10.50	0.30	10.51	10.51	10.85	10.12
2002	7	4	7.74	0.21	7.65	7.54	8.02	7.76
2003	7	4	4.99	0.35	4.76	4.68	5.08	5.44
2004	7	4	5.99	0.35	5.94	5.52	6.23	6.28
2005	7	4	6.28	0.27	6.16	6.19	6.10	6.69
2006	7	4	6.58	0.24	6.67	6.22	6.78	6.63
2001	8	4	11.54	0.09	11.56	11.41	11.55	11.62
2002	8	4	9.26	0.10	9.35	9.33	9.22	9.14
2003	8	4	6.19	0.16	6.07	6.08	6.19	6.42
2004	8	4	7.30	0.13	7.43	7.36	7.28	7.12
2005	8	4	7.68	0.04	7.63	7.66	7.73	7.68
2006	8	4	7.74	0.14	7.65	7.65	7.94	7.70
2001	9	4	11.34	0.14	11.50	11.41	11.20	11.25
2002	9	4	8.17	0.06	8.12	8.26	8.17	8.14
2003	9	4	5.16	0.14	5.28	5.28	5.06	5.01
2004	9	4	6.39	0.13	6.34	6.47	6.53	6.24
2005	9	4	6.51	0.17	6.72	6.49	6.50	6.32
2006	9	4	6.73	0.12	6.65	6.73	6.91	6.64
2001	10	4	11.80	0.14	11.88	11.89	11.85	11.60
2002	10	4	8.51	0.04	8.48	8.52	8.55	8.47
2003	10	4	5.71	0.08	5.69	5.62	5.81	5.74
2004	10	4	6.58	0.06	6.58	6.53	6.56	6.66
2005	10	4	6.89	0.09	7.02	6.82	6.83	6.88
2006	10	4	7.03	0.12	6.91	7.08	7.16	6.96
2001	13	4	11.26	0.01	11.27	11.27	11.24	11.26
2002	13	4	8.48	0.05	8.50	8.54	8.43	8.45
2003	13	4	5.03	0.07	5.11	5.05	4.95	5.01
2004	13	4	6.47	0.04	6.49	6.51	6.44	6.43
2005	13	4	6.35	0.08	6.39	6.41	6.24	6.37
2006	13	4	6.99	0.03	7.02	7.02	6.98	6.95
2001	14	4	11.46	0.24	11.76	11.50	11.38	11.20
2002	14	4	8.43	0.12	8.34	8.38	8.61	8.38
2003	14	4	5.85	0.14	5.70	6.04	5.81	5.83
2004	14	4	6.20	0.32	6.63	6.20	6.06	5.89
2005	14	4	6.73	0.09	6.83	6.61	6.72	6.76
2006	14	4	6.94	0.26	6.75	6.69	7.11	7.23
2001	15	4	12.49	0.21	12.57	12.67	12.19	12.52
2002	15	4	8.96	0.15	8.79	9.02	9.13	8.91

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	5.94	0.14	6.08	5.81	5.83	6.03
2004	15	4	7.19	0.12	7.22	7.06	7.14	7.34
2005	15	4	7.47	0.06	7.56	7.42	7.47	7.44
2006	15	4	7.63	0.12	7.50	7.79	7.62	7.61
2001	17	4	12.42	0.14	12.21	12.49	12.48	12.51
2002	17	4	9.77	0.15	9.70	9.63	9.99	9.74
2003	17	4	6.57	0.21	6.46	6.87	6.42	6.52
2004	17	4	7.63	0.24	7.71	7.28	7.82	7.70
2005	17	4	7.54	0.18	7.35	7.46	7.56	7.78
2006	17	4	8.21	0.14	8.24	8.04	8.38	8.17
2001	18	4	11.62	0.11	11.77	11.59	11.64	11.50
2002	18	4	8.81	0.23	9.00	8.52	8.98	8.75
2003	18	4	5.82	0.12	5.83	5.85	5.65	5.92
2004	18	4	6.63	0.17	6.66	6.57	6.84	6.44
2005	18	4	7.20	0.21	6.92	7.16	7.40	7.32
2006	18	4	7.20	0.38	7.35	6.66	7.54	7.27
2001	19	4	11.08	0.12	11.23	10.99	11.10	10.99
2002	19	4	8.34	0.21	8.55	8.10	8.48	8.23
2003	19	4	5.61	0.05	5.64	5.57	5.55	5.66
2004	19	4	6.30	0.10	6.29	6.24	6.44	6.22
2005	19	4	6.98	0.18	6.77	6.88	7.11	7.14
2006	19	4	7.02	0.43	7.16	6.39	7.33	7.18
2001	20	4	11.61	0.21	11.81	11.74	11.50	11.37
2002	20	4	8.69	0.16	8.82	8.46	8.67	8.78
2003	20	4	5.65	0.14	5.47	5.74	5.59	5.79
2004	20	4	6.41	0.19	6.40	6.27	6.68	6.28
2005	20	4	6.97	0.21	6.77	6.81	7.13	7.18
2006	20	4	7.20	0.31	7.25	6.76	7.47	7.33
2001	22	4	13.29 b	0.33	12.94	13.73	13.35	13.16
2002	22	0	10.27B	0.08	10.28	10.16	10.27	10.35
2003	22	4	7.15	0.23	7.04	7.48	6.95	7.12
2004	22	4	8.24 b	0.20	8.22	8.53	8.08	8.13
2005	22	4	8.48 b	0.13	8.67	8.45	8.44	8.37
2006	22	0	8.87B	0.10	8.84	8.97	8.74	8.92
2001	23	4	11.49	0.10	11.35	11.53	11.50	11.57
2002	23	4	8.43	0.18	8.68	8.42	8.38	8.23
2003	23	4	5.89	0.08	5.95	5.85	5.80	5.97
2004	23	4	6.70	0.26	7.03	6.60	6.42	6.76
2005	23	4	6.90	0.38	6.34	7.10	7.15	7.02
2006	23	4	7.12	0.18	6.88	7.27	7.09	7.25
2001	24	4	11.60	0.08	11.71	11.56	11.61	11.53
2002	24	4	7.78	0.07	7.72	7.80	7.87	7.72
2003	24	4	4.87	0.08	4.95	4.77	4.86	4.90
2004	24	4	5.79	0.12	5.79	5.74	5.95	5.67
2005	24	4	6.16	0.03	6.17	6.15	6.20	6.13
2006	24	4	6.38	0.08	6.43	6.43	6.25	6.39
2001	25	4	11.45	0.22	11.68	11.60	11.23	11.29
2002	25	4	7.87	0.17	7.77	7.81	7.79	8.12
2003	25	4	5.16	0.08	5.17	5.15	5.05	5.25
2004	25	4	5.98	0.16	6.16	5.76	6.01	5.99
2005	25	4	6.36	0.23	6.63	6.12	6.24	6.43
2006	25	4	6.63	0.10	6.73	6.66	6.49	6.64
2001	26	4	11.09	0.18	11.31	10.90	10.99	11.16

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	8.04	0.17	8.18	8.06	7.80	8.11
2003	26	4	5.68	0.12	5.80	5.77	5.56	5.59
2004	26	4	6.18	0.06	6.10	6.17	6.20	6.24
2005	26	4	6.59	0.11	6.63	6.63	6.68	6.44
2006	26	4	6.72	0.22	6.91	6.48	6.57	6.89
2001	27	4	11.88	0.16	11.94	11.69	12.07	11.82
2002	27	4	8.38	0.15	8.30	8.50	8.52	8.22
2003	27	4	5.44	0.16	5.33	5.31	5.66	5.49
2004	27	4	6.55	0.13	6.51	6.42	6.55	6.72
2005	27	4	6.62	0.17	6.77	6.54	6.76	6.42
2006	27	4	6.99	0.07	6.91	6.97	7.01	7.07
2001	28	4	11.25	0.45	11.20	10.63	11.60	11.59
2002	28	4	8.59	0.16	8.49	8.84	8.51	8.54
2003	28	4	6.15	0.21	6.31	6.05	6.34	5.90
2004	28	4	6.90	0.11	6.92	6.74	6.93	7.00
2005	28	4	7.06	0.26	7.16	7.25	6.68	7.13
2006	28	4	7.37	0.10	7.44	7.31	7.45	7.26
2001	29	4	10.97	0.26	10.90	11.30	11.00	10.69
2002	29	4	7.88	0.07	7.95	7.81	7.83	7.94
2003	29	4	5.47	0.77C	4.87	5.36	5.05	6.58
2004	29	4	6.38	0.30	6.80	6.12	6.36	6.26
2005	29	4	6.70	0.22	6.91	6.51	6.50	6.88
2006	29	3	7.03	0.30	7.04	7.31	6.72	
2001	30	4	13.34 b	0.06	13.42	13.26	13.33	13.34
2002	30	0	10.33B	0.10	10.42	10.26	10.40	10.22
2003	30	4	7.51	0.05	7.51	7.54	7.55	7.45
2004	30	4	8.69 b	0.07	8.65	8.69	8.78	8.63
2005	30	4	8.72 b	0.08	8.69	8.76	8.79	8.62
2006	30	0	9.38B	0.09	9.41	9.45	9.40	9.26
2001	31	4	10.89	0.61C	10.04	10.87	11.43	11.21
2002	31	4	8.14	0.19	7.91	8.17	8.12	8.37
2003	31	4	5.84	0.18	5.96	5.75	6.01	5.63
2004	31	4	6.70	0.18	6.45	6.73	6.75	6.88
2005	31	4	6.78	0.17	6.96	6.67	6.61	6.88
2006	31	4	6.77	0.37	7.22	6.54	6.42	6.92
2001	32	4	11.83	0.19	11.74	12.00	11.61	11.98
2002	32	4	9.15	0.20	9.11	8.94	9.14	9.42
2003	32	4	6.77	0.17	6.86	6.56	6.95	6.70
2004	32	4	7.35	0.25	7.53	7.13	7.16	7.61
2005	32	4	7.67	0.11	7.77	7.59	7.77	7.56
2006	32	4	7.75	0.18	8.01	7.62	7.65	7.72
2001	33	0	7.98B	0.24	7.78	8.31	7.84	7.98
2002	33	4	6.09	0.59C	5.57	5.58	6.61	6.58
2003	33	4	4.18	0.04	4.14	4.22	4.16	4.22
2004	33	4	5.26	0.28	5.06	5.00	5.61	5.35
2005	33	4	5.53	0.23	5.67	5.47	5.23	5.74
2006	33	4	5.79	0.35	5.40	5.83	5.67	6.24
2001	34	4	11.54	0.20	11.75	11.65	11.32	11.42
2002	34	4	8.38	0.23	8.30	8.15	8.39	8.70
2003	34	4	5.02	0.20	5.12	5.00	5.21	4.76
2004	34	4	6.55	0.20	6.72	6.35	6.41	6.73
2005	34	4	6.63	0.26	6.91	6.63	6.29	6.69
2006	34	4	6.99	0.23	7.04	6.94	7.26	6.71

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	11.74	0.15	11.92	11.54	11.75	11.74		
2002	35	4	8.86	0.21	8.78	8.60	9.07	8.98		
2003	35	4	5.97	0.23	5.67	6.22	5.98	6.00		
2004	35	4	6.75	0.11	6.64	6.90	6.70	6.77		
2005	35	4	7.21	0.07	7.25	7.28	7.18	7.12		
2006	35	4	7.29	0.18	7.03	7.43	7.30	7.38		
2001	36	4	12.64	0.22	12.95	12.42	12.57	12.62		
2002	36	4	9.47	0.17	9.36	9.70	9.48	9.33		
2003	36	4	6.73	0.06	6.70	6.82	6.70	6.72		
2004	36	4	7.74	0.14	7.81	7.56	7.88	7.72		
2005	36	4	8.07	0.21	8.03	7.79	8.25	8.19		
2006	36	4	8.19	0.19	8.46	8.16	8.14	8.01		
2001	37	6	12.09	0.30	11.78	12.07	11.82	12.33	11.98	12.55
2002	37	6	8.34	0.21	8.54	8.63	8.08	8.16	8.29	8.32
2003	37	6	5.01	0.16	5.14	4.85	5.12	5.07	5.08	4.78
2004	37	6	5.95	0.17	5.81	5.96	6.11	6.10	6.02	5.69
2005	37	6	6.46	0.15	6.28	6.34	6.35	6.66	6.57	6.54
2006	37	6	6.87	0.10	6.83	6.75	6.86	6.85	7.05	6.87
2001	38	4	11.80	0.16	11.67	11.92	11.65	11.96		
2002	38	4	8.90	0.21	8.86	8.79	8.74	9.20		
2003	38	4	6.02	0.21	6.04	5.73	6.24	6.07		
2004	38	4	7.29	0.04	7.25	7.34	7.31	7.26		
2005	38	4	7.37	0.23	7.64	7.16	7.48	7.20		
2006	38	4	7.78	0.16	7.56	7.79	7.82	7.96		
2001	40	4	12.07	0.47	12.55	11.46	11.98	12.30		
2002	40	4	8.61	0.05	8.59	8.62	8.68	8.56		
2003	40	4	5.65	0.18	5.86	5.73	5.52	5.48		
2004	40	4	6.76	0.23	6.89	6.41	6.85	6.89		
2005	40	4	7.10	0.19	7.33	6.97	7.17	6.93		
2006	40	4	7.25	0.13	7.36	7.35	7.14	7.13		
2001	113	4	11.97	0.07	12.06	11.96	11.90	11.94		
2002	113	4	8.65	0.09	8.58	8.59	8.65	8.77		
2003	113	5	5.58	0.09	5.59	5.56	5.51	5.50	5.71	
2004	113	5	6.25	0.01	6.26	6.24	6.25	6.25	6.26	
2005	113	5	6.70	0.06	6.75	6.74	6.70	6.61	6.68	
2006	113	5	7.12	0.04	7.11	7.16	7.14	7.12	7.06	
2001	137	6	12.04	0.22	11.77	12.00	11.85	12.27	12.04	12.31
2002	137	6	8.27	0.25	8.27	8.70	8.08	7.99	8.27	8.29
2003	137	6	4.92	0.15	5.06	4.73	4.98	5.06	4.96	4.74
2004	137	6	5.97	0.11	6.06	5.91	6.11	6.00	5.95	5.80
2005	137	6	6.42	0.07	6.40	6.46	6.34	6.46	6.51	6.34
2006	137	6	6.81	0.21	6.55	6.58	7.04	6.83	7.03	6.82

18.7 aNDFom

18.7.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-1.61	-1.51	-0.46	-0.75	-1.05	-0.33
3	-0.94	-0.15	-1.20	-0.93	-1.19	-0.33
5	2.61	2.05	2.20	2.79	1.91	1.97
6	-0.12	1.18	2.19	1.26	1.64	0.14
7	-0.16	1.20	1.47	1.53	0.32	1.66
8	-3.23	-3.51	-3.77	-3.45	-4.16	-3.87
9	-0.54	-0.83	-0.02	-0.71	-0.48	-0.24
10	-0.27	-0.55	0.03	-0.09	-0.02	0.51
13	1.93	-0.03	0.77	-0.17	2.29	0.12
14	-0.08	-0.56	-0.55	-0.58	-0.55	-0.30
15	-0.17	0.76	0.75	0.55	0.55	-0.93
17	0.20	1.71	2.43	2.01	1.97	0.70
18	-0.31	-0.27	-0.42	0.17	0.11	-0.53
19	-0.84	-1.07	-1.02	-0.63	-0.52	-1.06
20	-1.84	-1.41	-1.81	-1.02	-1.27	-1.71
22	0.10	-0.37	-0.97	-0.75	-1.11	-0.91
23	-0.08	0.28	-0.09	0.35	0.94	0.48
24	0.25	-0.45	0.45	0.00	0.32	-0.13
25	-0.20	-0.66	-1.04	-0.71	-0.82	-1.26
26	-0.04	0.39	0.47	1.64	0.97	0.82
27	0.44	0.30	-0.24	0.15	-0.44	0.31
28	0.49	0.30	0.36	0.02	-0.05	0.30
29	0.82	0.31	0.11	0.01	1.78	2.92
30	-0.59	-0.47	-0.39	-3.07	-1.77	-0.94
31	-1.20	0.20	1.00	0.80	1.15	1.52
32	1.57	2.15	1.78	2.71	2.45	3.54
33	-0.08	-0.13	-0.11	0.09	-0.35	-0.93
34	3.08	2.02	0.80	0.92	1.94	0.92
35	-0.64	0.11	-0.08	0.82	0.44	-0.20
36	0.15	0.16	-0.69	0.71	-0.40	-0.93
37	0.39	-0.55	-1.14	-1.10	-1.25	-1.09
38	2.62	2.98	1.71	1.24	0.73	2.17
40	-0.18	0.10	0.41	0.74	0.09	0.38
113	-1.17	-2.30	-1.08	-2.64	-1.32	-0.95
137	-0.36	-1.35	-1.87	-1.89	-1.87	-1.81

18.7.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	53.03	0.78	53.65	52.65	52.12	53.72
2002	1	4	36.11	0.79	35.68	35.73	35.76	37.29
2003	1	4	34.74	0.38	34.47	34.35	35.04	35.09
2004	1	4	33.66	0.81	34.28	32.59	33.48	34.30
2005	1	4	33.08	1.30	33.97	31.57	34.34	32.44
2006	1	4	36.09	0.50	35.61	35.84	36.14	36.76
2001	3	4	54.20	0.97	54.86	55.16	53.63	53.14
2002	3	4	38.48	0.66	38.30	38.80	39.18	37.65
2003	3	4	33.45	0.26	33.42	33.51	33.10	33.74

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	33.34	0.47	33.84	33.11	32.80	33.60
2005	3	4	32.84	0.48	32.25	33.40	32.97	32.75
2006	3	4	36.08	0.44	36.26	35.42	36.29	36.35
2001	5	4	60.42	0.15	60.37	60.62	60.27	60.41
2002	5	4	42.34	0.51	42.70	42.15	42.79	41.71
2003	5	4	39.39	0.19	39.42	39.22	39.66	39.28
2004	5	4	39.85	0.37	39.81	40.32	39.86	39.40
2005	5	4	38.26	0.38	37.92	38.43	38.72	37.97
2006	5	4	40.10	0.52	39.97	40.16	40.77	39.52
2001	6	4	55.64	2.06	53.82	54.19	56.29	58.27
2002	6	4	40.83	1.31	38.96	42.00	41.28	41.06
2003	6	4	39.38	0.54	38.77	40.06	39.24	39.46
2004	6	4	37.17	1.88	35.98	39.70	35.54	37.48
2005	6	4	37.80	2.01	35.01	39.78	37.96	38.45
2006	6	4	36.91	1.28	37.78	37.72	35.05	37.09
2001	7	4	55.57	1.87	57.26	57.11	53.95	53.94
2002	7	4	40.85	2.00	39.80	43.82	39.56	40.21
2003	7	4	38.12	1.58	39.53	39.40	37.07	36.47
2004	7	4	37.64	1.88	39.11	38.13	34.88	38.45
2005	7	4	35.49	1.71	37.57	36.01	34.84	33.54
2006	7	4	39.57	0.41	39.88	39.18	39.26	39.98
2001	8	4	50.20	0.53	49.85	50.85	50.40	49.68
2002	8	4	32.61	0.87	33.67	32.55	32.66	31.54
2003	8	4	28.95	1.30	30.80	28.54	28.75	27.73
2004	8	4	28.94	1.29	27.54	30.18	29.88	28.16
2005	8	4	27.65b	0.55	26.89	27.99	27.60	28.11
2006	8	4	29.89	0.61	29.70	29.13	30.52	30.23
2001	9	4	54.90	0.64	55.74	55.03	54.46	54.36
2002	9	4	37.30	0.42	37.54	36.86	37.75	37.04
2003	9	4	35.50	0.78	35.81	36.27	34.45	35.47
2004	9	4	33.73	0.59	33.55	34.55	33.68	33.14
2005	9	4	34.09	0.22	34.33	33.88	33.92	34.21
2006	9	4	36.25	0.35	35.76	36.55	36.26	36.41
2001	10	4	55.38	0.76	55.66	54.94	54.62	56.31
2002	10	4	37.79	0.52	37.51	37.27	37.91	38.46
2003	10	4	35.60	0.50	35.88	34.88	36.01	35.62
2004	10	4	34.82	0.11	34.72	34.75	34.85	34.95
2005	10	4	34.88	0.35	34.47	35.27	34.76	35.03
2006	10	4	37.56	0.45	38.03	37.77	36.98	37.45
2001	13	4	59.22	0.21	59.20	59.18	58.99	59.50
2002	13	4	38.70	0.33	38.26	38.79	38.69	39.06
2003	13	4	36.89	0.10	37.03	36.85	36.87	36.81
2004	13	4	34.67	0.28	34.27	34.76	34.91	34.75
2005	13	4	38.93	0.36	38.98	38.63	39.42	38.67
2006	13	4	36.87	0.12	36.88	36.85	36.72	37.01
2001	14	4	55.71	1.64	57.84	53.91	55.22	55.86
2002	14	4	37.77	0.85	38.25	36.55	38.43	37.85
2003	14	4	34.59	0.66	33.75	34.63	35.35	34.63
2004	14	4	33.95	0.54	33.38	34.50	34.30	33.61
2005	14	4	33.95	0.64	34.82	33.55	34.03	33.41
2006	14	4	36.13	0.64	35.54	36.27	36.98	35.74
2001	15	4	55.55	0.35	55.99	55.41	55.17	55.64
2002	15	4	40.09	0.58	40.76	40.23	40.03	39.35

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	36.86	1.00	37.49	35.38	37.47	37.11
2004	15	4	35.94	0.55	36.45	35.40	36.38	35.53
2005	15	4	35.88	0.78	35.46	36.28	35.02	36.75
2006	15	4	35.04	1.80	32.63	34.69	36.57	36.25
2001	17	4	56.19	0.38	55.85	56.73	56.01	56.18
2002	17	4	41.75	0.85	41.14	42.67	40.93	42.27
2003	17	4	39.80	1.04	38.74	41.24	39.55	39.66
2004	17	4	38.48	0.50	38.83	38.87	38.43	37.78
2005	17	4	38.37	1.05	39.89	38.20	37.85	37.54
2006	17	4	37.89	1.12	37.16	39.55	37.23	37.62
2001	18	4	55.31	0.78	55.56	55.19	56.16	54.31
2002	18	4	38.28	0.20	38.09	38.39	38.50	38.13
2003	18	4	34.80	0.54	35.08	34.55	34.19	35.39
2004	18	4	35.27	0.97	34.50	34.44	35.70	36.44
2005	18	4	35.11	0.75	36.06	35.14	34.24	34.99
2006	18	4	35.73	0.92	36.09	35.56	36.71	34.54
2001	19	4	54.38	0.95	54.90	54.45	55.15	53.03
2002	19	4	36.88	0.24	36.84	36.74	37.23	36.71
2003	19	4	33.76	0.34	33.28	33.89	33.82	34.05
2004	19	4	33.86	0.66	33.40	33.23	34.64	34.17
2005	19	4	34.02	0.53	34.70	33.98	33.41	34.00
2006	19	4	34.81	1.16	35.20	34.81	35.99	33.24
2001	20	4	52.63	1.14	52.50	53.10	53.79	51.11
2002	20	4	36.29	0.18	36.13	36.54	36.27	36.21
2003	20	4	32.38	1.12	31.34	32.12	32.08	33.97
2004	20	4	33.18	1.06	32.93	31.89	33.47	34.43
2005	20	4	32.71	0.68	32.84	33.22	31.71	33.06
2006	20	4	33.67	1.06	34.47	33.57	34.44	32.21
2001	22	4	56.03	1.44	56.79	54.51	55.17	57.64
2002	22	4	38.12	0.81	37.14	37.96	39.09	38.27
2003	22	4	33.85	0.35	34.37	33.70	33.67	33.67
2004	22	4	33.66	1.50	32.06	33.31	35.67	33.60
2005	22	4	32.98	0.39	32.58	33.50	33.01	32.82
2006	22	4	35.06	2.17	32.37	34.23	36.96	36.69
2001	23	4	55.71	0.95	55.64	57.01	54.73	55.47
2002	23	4	39.24	0.26	39.14	39.02	39.62	39.19
2003	23	4	35.39	1.82	34.63	36.70	37.06	33.18
2004	23	4	35.57	0.40	35.25	35.61	35.31	36.12
2005	23	4	36.57	1.15	37.97	35.50	35.76	37.05
2006	23	4	37.50	0.94	37.06	37.11	38.90	36.93
2001	24	4	56.28	0.30	56.04	56.56	56.00	56.52
2002	24	4	37.98	0.14	38.03	38.04	38.07	37.76
2003	24	4	36.34	0.80	35.36	36.65	36.09	37.24
2004	24	4	34.98	0.23	35.28	35.04	34.77	34.82
2005	24	4	35.48	0.38	35.97	35.39	35.07	35.49
2006	24	4	36.44	0.41	36.36	36.96	35.95	36.48
2001	25	4	55.49	0.27	55.27	55.25	55.67	55.78
2002	25	4	37.60	0.39	37.74	37.68	37.04	37.92
2003	25	4	33.72	1.20	32.78	34.33	35.10	32.65
2004	25	4	33.72	0.66	33.58	34.52	33.86	32.92
2005	25	4	33.49	1.00	33.50	32.22	34.66	33.56
2006	25	4	34.46	0.88	35.24	34.56	33.22	34.84
2001	26	4	55.78	0.78	55.06	56.08	56.73	55.23

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	39.45	1.09	40.98	38.51	39.41	38.89
2003	26	4	36.36	1.98	37.30	38.68	34.44	35.02
2004	26	4	37.84	0.43	38.28	37.31	37.68	38.09
2005	26	4	36.62	0.29	36.85	36.56	36.84	36.23
2006	26	4	38.10	1.17	39.38	38.74	37.44	36.82
2001	27	4	56.62	0.19	56.89	56.63	56.50	56.47
2002	27	4	39.28	0.49	39.27	39.74	39.49	38.59
2003	27	4	35.13	0.22	34.85	35.23	35.37	35.07
2004	27	4	35.23	0.33	35.48	34.77	35.44	35.22
2005	27	4	34.16	0.38	33.84	34.49	34.48	33.83
2006	27	4	37.20	0.63	36.81	37.76	37.71	36.52
2001	28	4	56.71	1.48	56.98	58.22	56.98	54.67
2002	28	4	39.27	0.13	39.11	39.39	39.23	39.37
2003	28	4	36.17	1.61	34.78	35.89	38.49	35.52
2004	28	4	35.01	0.35	34.81	35.27	35.35	34.62
2005	28	4	34.83	0.62	35.43	34.41	35.29	34.19
2006	28	4	37.19	0.46	36.78	36.90	37.29	37.79
2001	29	4	57.29	1.09	56.01	58.34	58.04	56.76
2002	29	4	39.31	0.43	39.72	39.52	39.25	38.73
2003	29	4	35.74	0.77	34.72	35.57	36.47	36.20
2004	29	4	34.98	1.53	37.14	33.81	33.99	34.98
2005	29	4	38.03	1.97	36.95	37.03	37.17	40.98
2006	29	3	41.77	0.68	41.04	41.85	42.40	
2001	30	4	54.82	0.51	55.15	55.08	54.98	54.06
2002	30	4	37.93	0.67	37.69	38.55	38.37	37.10
2003	30	4	34.86	0.41	35.14	34.99	35.07	34.24
2004	30	4	29.60	0.41	29.62	29.36	30.16	29.26
2005	30	4	31.82	0.50	32.20	31.23	32.27	31.60
2006	30	4	35.02	0.44	35.58	35.11	34.83	34.55
2001	31	4	53.75	4.43C	47.25	55.02	57.17	55.58
2002	31	4	39.11	3.35C	39.06	39.87	34.71	42.80
2003	31	4	37.30	0.68	37.65	38.08	36.71	36.75
2004	31	4	36.36	2.20 c	33.23	38.14	36.47	37.62
2005	31	4	36.93	1.59	37.37	35.22	36.22	38.92
2006	31	4	39.32	2.50 c	40.56	40.74	35.58	40.39
2001	32	4	58.59	0.96	58.37	57.64	59.92	58.43
2002	32	4	42.52	1.01	41.63	43.55	41.67	43.21
2003	32	4	38.65	0.81	38.69	37.49	39.33	39.09
2004	32	4	39.72	0.63	40.31	39.45	40.16	38.95
2005	32	4	39.22	0.49	39.19	39.68	38.55	39.45
2006	32	4	42.85	0.43	42.90	43.41	42.38	42.73
2001	33	4	55.71	0.64	55.39	55.28	56.66	55.53
2002	33	4	38.53	1.00	39.36	39.43	37.59	37.75
2003	33	4	35.36	1.41	35.03	37.09	35.62	33.70
2004	33	4	35.13	0.72	35.05	34.69	34.60	36.16
2005	33	4	34.32	1.58	33.70	33.30	36.67	33.59
2006	33	4	35.03	1.07	33.64	34.89	36.20	35.39
2001	34	4	61.24	1.47	61.16	62.32	62.27	59.19
2002	34	4	42.29	1.73	43.20	41.80	40.10	44.05
2003	34	4	36.95	0.62	37.80	36.74	36.93	36.33
2004	34	4	36.58	2.61C	38.49	35.18	33.61	39.04
2005	34	3	36.57	0.17	36.40	36.59	36.73	43.56A
2006	34	4	38.27	3.45C	37.11	42.99	38.17	34.79

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	54.72	1.15	54.28	56.11	53.41	55.08		
2002	35	4	38.95	1.31	38.92	37.11	39.78	39.99		
2003	35	4	35.41	0.90	35.65	35.38	34.22	36.38		
2004	35	4	36.40	0.79	36.52	35.59	36.05	37.44		
2005	35	4	35.69	0.75	35.73	36.45	34.66	35.91		
2006	35	4	36.31	0.33	36.31	36.40	36.66	35.87		
2001	36	4	56.11	0.61	56.42	55.98	55.32	56.73		
2002	36	4	39.03	0.56	38.99	38.42	38.93	39.78		
2003	36	4	34.34	0.66	35.27	33.72	34.13	34.23		
2004	36	4	36.21	1.39	34.55	37.44	35.58	37.27		
2005	36	4	34.22	1.28	34.18	32.50	34.65	35.55		
2006	36	4	35.03	0.89	33.99	36.07	35.34	34.71		
2001	37	6	56.53	1.60	58.37	55.74	56.50	58.08	56.50	54.01
2002	37	6	37.79	0.46	37.97	38.21	37.67	36.99	38.21	37.70
2003	37	6	33.54	0.30	33.72	33.27	33.79	33.60	33.78	33.09
2004	37	6	33.05	0.42	32.96	33.61	33.40	32.42	33.03	32.85
2005	37	6	32.73	0.65	32.66	32.77	32.23	31.94	33.80	32.96
2006	37	6	34.76	0.72	34.15	35.46	34.96	33.81	34.55	35.62
2001	38	4	60.43	0.87	60.41	59.50	61.59	60.20		
2002	38	4	43.97	3.19C	41.85	40.63	47.04	46.34		
2003	38	4	38.54	1.59	40.19	38.37	39.17	36.44		
2004	38	4	37.14	1.28	37.78	38.21	35.30	37.26		
2005	38	4	36.20	2.75C	36.28	34.87	33.65	40.00		
2006	38	4	40.46	2.14	39.01	39.22	40.01	43.61		
2001	40	4	55.54	1.29	53.89	56.76	56.34	55.16		
2002	40	4	38.92	1.00	38.92	38.01	38.45	40.32		
2003	40	4	36.26	1.19	35.38	36.92	37.59	35.15		
2004	40	4	36.26	1.07	35.17	37.55	35.64	36.69		
2005	40	4	35.09	0.85	34.14	36.04	34.66	35.52		
2006	40	4	37.33	1.62	35.32	38.88	36.74	38.37		
2001	113	4	53.81	0.16	53.81	53.64	54.02	53.75		
2002	113	4	34.72	0.30	35.03	34.32	34.73	34.82		
2003	113	5	33.66	0.75	33.83	34.01	34.25	33.86	32.35	
2004	113	5	30.34	0.22	30.40	30.35	30.67	30.23	30.07	
2005	113	5	32.61	0.14	32.61	32.53	32.53	32.85	32.53	
2006	113	5	34.99	0.21	35.08	34.78	34.83	35.29	34.99	
2001	137	6	55.22	1.52	57.14	54.66	55.41	56.45	54.88	52.81
2002	137	6	36.39	0.84	36.71	36.89	35.18	35.60	37.45	36.47
2003	137	6	32.27	0.51	32.79	31.66	32.78	32.34	32.40	31.65
2004	137	6	31.66	0.81	31.87	33.07	31.89	30.85	30.98	31.33
2005	137	6	31.65	0.56	31.42	31.84	31.08	31.08	32.46	32.05
2006	137	6	33.50	0.62	33.14	32.99	34.03	32.99	33.37	34.48

18.8 ADFom

18.8.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-0.79	-1.19	-0.74	-0.96	-1.01	-0.49
3	-2.16	-1.03	-1.52	-1.17	-1.63	-0.64
5	1.53	0.56	0.77	1.66	0.45	0.88
6	-0.56	0.44	0.28	0.45	0.45	-0.26
7	0.16	0.13	0.38	0.76	0.01	0.77
8	-1.34	-1.10	-1.49	-1.35	-1.27	-1.22
9	0.80	0.87	0.99	0.75	0.85	0.94
10	-0.34	-0.44	0.17	0.00	0.14	0.12
13	1.15	-0.01	-0.64	-0.48	0.37	-0.39
14	-0.61	-0.32	-0.24	-0.30	-0.22	-0.11
15	-0.41	0.33	0.29	-0.11	-0.05	-1.32
17	1.24	2.39	2.10	2.34	1.78	1.28
18	-0.08	-0.24	-0.60	-0.18	0.20	-0.71
19	-0.52	-0.56	-0.66	-0.45	-0.02	-0.81
20	-0.98	-1.05	-1.38	-1.05	-0.74	-1.31
22	1.73	1.60	1.46	1.47	1.40	1.65
23	1.10	1.55	1.11	1.31	1.81	1.50
24	-0.45	-0.30	0.38	-0.23	0.04	0.08
25	-0.27	-0.51	-0.86	-0.38	-0.48	-0.80
26	0.44	0.90	1.34	1.84	1.00	1.03
27	0.23	0.43	0.30	0.22	-0.30	0.52
28	-0.50	-0.10	0.37	-0.02	-0.14	-0.01
29	-1.93	-1.58	-1.42	-1.78	-0.41	0.94
30	0.65	0.94	1.83	-1.12	-0.18	1.05
31	0.31	0.67	0.77	1.02	0.56	1.08
32	-1.36	-1.27	-1.00	-0.37	-0.34	-0.00
33	-2.47	-1.84	-1.45	-1.60	-1.62	-1.93
34	1.82	1.41	1.26	1.23	1.28	1.19
35	-1.06	0.09	-0.03	0.53	0.16	-0.32
36	0.78	0.89	-0.01	1.05	0.79	-0.07
37	1.05	-0.34	-1.01	-1.12	-0.82	-1.03
38	1.08	1.19	0.99	0.91	0.54	1.06
40	0.50	-0.03	-0.01	0.24	-0.35	-0.30
113	-0.06	-2.45	-1.12	-2.29	-1.57	-1.57
137	1.31	-0.03	-0.61	-0.82	-0.68	-0.79

18.8.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	33.20	0.15	33.00	33.26	33.18	33.35
2002	1	4	22.13	0.29	22.22	21.72	22.20	22.38
2003	1	4	19.64	0.19	19.82	19.75	19.57	19.41
2004	1	4	19.63	0.23	19.94	19.65	19.54	19.40
2005	1	4	19.81	0.76	20.55	18.91	20.31	19.48
2006	1	4	20.83	0.24	21.00	20.87	20.48	20.97
2001	3	4	31.69	0.38	31.34	31.45	31.78	32.19
2002	3	4	22.31	0.13	22.13	22.42	22.40	22.29
2003	3	4	18.79	0.38	19.01	18.66	18.31	19.16

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	19.41	0.35	19.71	19.02	19.69	19.21
2005	3	4	19.14	0.30	19.14	18.89	19.56	18.96
2006	3	4	20.67	0.29	21.05	20.35	20.57	20.71
2001	5	4	35.75	0.36	35.33	35.97	35.59	36.12
2002	5	4	24.05	0.26	24.20	23.86	24.35	23.80
2003	5	4	21.31	0.27	21.45	21.62	21.07	21.09
2004	5	4	22.51	0.31	22.40	22.64	22.86	22.15
2005	5	4	21.42	0.18	21.31	21.59	21.56	21.23
2006	5	4	22.34	0.22	22.41	22.60	22.25	22.08
2001	6	4	33.46	0.22	33.40	33.17	33.61	33.66
2002	6	4	23.92	0.27	23.70	24.00	24.26	23.73
2003	6	4	20.77	0.30	20.36	20.86	20.78	21.08
2004	6	4	21.19	0.36	20.82	21.61	20.97	21.35
2005	6	4	21.42	0.46	20.73	21.65	21.66	21.65
2006	6	4	21.08	0.20	21.01	21.38	20.95	21.00
2001	7	4	34.25	0.54	34.43	34.66	34.45	33.45
2002	7	4	23.59	0.49	23.39	23.52	24.28	23.16
2003	7	4	20.88	0.30	20.62	20.89	21.30	20.70
2004	7	4	21.52	0.62	22.39	21.57	21.05	21.09
2005	7	4	20.93	0.57	21.28	20.45	21.56	20.44
2006	7	4	22.22	0.25	22.54	22.29	22.07	21.97
2001	8	4	32.60	0.19	32.50	32.53	32.48	32.88
2002	8	4	22.23	0.22	22.43	22.39	21.94	22.18
2003	8	4	18.82	0.27	19.21	18.77	18.63	18.68
2004	8	4	19.21	0.26	18.85	19.47	19.29	19.22
2005	8	4	19.53	0.03	19.53	19.51	19.50	19.57
2006	8	4	20.02	0.32	19.80	19.73	20.41	20.15
2001	9	4	34.95	0.39	35.41	34.97	34.99	34.45
2002	9	4	24.39	0.24	24.33	24.14	24.71	24.39
2003	9	4	21.54	0.23	21.52	21.59	21.25	21.82
2004	9	4	21.51	0.26	21.60	21.73	21.14	21.59
2005	9	4	21.86	0.05	21.93	21.83	21.86	21.80
2006	9	4	22.40	0.26	22.08	22.63	22.29	22.60
2001	10	4	33.70	0.41	33.38	33.54	33.57	34.30
2002	10	4	22.96	0.23	23.02	22.66	22.93	23.23
2003	10	4	20.64	0.56	21.02	19.99	21.19	20.36
2004	10	4	20.70	0.19	20.75	20.51	20.94	20.59
2005	10	4	21.08	0.34	20.86	21.59	20.91	20.96
2006	10	4	21.51	0.23	21.67	21.58	21.61	21.16
2001	13	4	35.33	0.08	35.29	35.35	35.26	35.43
2002	13	4	23.43	0.05	23.39	23.41	23.43	23.51
2003	13	4	19.75	0.03	19.76	19.74	19.72	19.80
2004	13	4	20.16	0.05	20.12	20.18	20.21	20.12
2005	13	4	21.34	0.09	21.26	21.33	21.47	21.29
2006	13	4	20.94	0.06	20.98	20.94	20.86	20.98
2001	14	4	33.40	0.49	32.85	33.13	33.73	33.87
2002	14	4	23.09	0.46	23.37	22.46	23.49	23.02
2003	14	4	20.19	0.24	20.02	20.05	20.53	20.17
2004	14	4	20.36	0.22	20.05	20.42	20.59	20.38
2005	14	4	20.69	0.31	21.14	20.63	20.43	20.54
2006	14	4	21.25	0.39	21.02	21.22	21.80	20.95
2001	15	4	33.62	0.24	33.89	33.45	33.76	33.38
2002	15	4	23.81	0.41	24.23	23.98	23.76	23.26

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	20.78	0.71	20.75	19.84	21.52	21.01
2004	15	4	20.57	0.49	21.00	19.95	20.93	20.38
2005	15	4	20.87	0.32	20.66	21.18	20.54	21.10
2006	15	4	19.92	0.72	19.14	19.46	20.49	20.58
2001	17	4	35.43	0.36	35.49	35.78	34.92	35.53
2002	17	4	26.07	0.23	25.75	26.32	26.12	26.09
2003	17	4	22.77	0.17	22.69	22.56	22.87	22.95
2004	17	4	23.27	0.27	23.42	23.01	23.57	23.06
2005	17	4	22.88	0.17	23.02	22.64	22.92	22.93
2006	17	4	22.78	0.45	23.30	22.99	22.49	22.33
2001	18	4	33.98	0.49	34.19	34.00	34.45	33.31
2002	18	4	23.17	0.19	22.93	23.16	23.38	23.23
2003	18	4	19.79	0.17	19.63	19.79	19.72	20.03
2004	18	4	20.49	0.66	20.12	19.76	21.20	20.88
2005	18	4	21.15	0.38	21.59	20.80	21.34	20.86
2006	18	4	20.59	0.98	20.75	20.37	21.81	19.43
2001	19	4	33.50	0.49	33.63	33.55	33.98	32.82
2002	19	4	22.82	0.14	22.72	22.84	23.01	22.71
2003	19	4	19.73	0.27	19.42	20.06	19.64	19.79
2004	19	4	20.20	0.62	20.02	19.41	20.82	20.53
2005	19	4	20.90	0.39	21.35	20.60	21.12	20.55
2006	19	4	20.48	0.94	20.63	20.25	21.65	19.39
2001	20	4	32.99	0.66	33.06	33.03	33.74	32.14
2002	20	4	22.28	0.15	22.10	22.36	22.43	22.24
2003	20	4	18.93	0.45	18.40	18.89	18.95	19.50
2004	20	4	19.54	0.70	19.43	18.59	19.95	20.17
2005	20	4	20.11	0.09	20.18	20.06	20.01	20.18
2006	20	4	19.93	0.95	20.28	19.93	20.87	18.62
2001	22	4	35.97	0.57	36.51	35.30	35.70	36.38
2002	22	4	25.20	0.22	25.30	25.21	25.39	24.90
2003	22	4	22.06	0.31	22.06	21.83	22.50	21.85
2004	22	4	22.31	0.23	22.52	22.49	22.12	22.10
2005	22	4	22.47	0.36	22.64	22.67	22.64	21.94
2006	22	4	23.19	0.43	22.69	23.05	23.28	23.72
2001	23	4	35.28	0.57	35.36	36.06	34.85	34.86
2002	23	4	25.15	0.07	25.12	25.22	25.06	25.18
2003	23	4	21.68	1.06C	21.25	22.39	22.69	20.38
2004	23	4	22.13	0.37	21.83	22.05	21.97	22.66
2005	23	4	22.92	0.82	23.94	22.21	22.31	23.22
2006	23	4	23.02	0.63	22.68	22.62	23.95	22.84
2001	24	4	33.58	0.41	33.01	33.89	33.86	33.56
2002	24	4	23.11	0.27	23.22	22.82	23.43	22.96
2003	24	4	20.88	0.60	20.21	21.22	20.55	21.52
2004	24	4	20.44	0.23	20.75	20.33	20.46	20.20
2005	24	4	20.97	0.54	21.50	20.76	20.31	21.30
2006	24	4	21.46	0.24	21.57	21.74	21.25	21.28
2001	25	4	33.77	0.14	33.61	33.72	33.87	33.90
2002	25	4	22.88	0.17	23.06	22.73	22.74	22.98
2003	25	4	19.52	0.57	19.10	19.97	20.04	18.96
2004	25	4	20.27	0.34	20.39	20.49	20.43	19.77
2005	25	4	20.40	0.42	20.55	19.80	20.79	20.47
2006	25	4	20.49	0.39	20.84	20.52	19.95	20.66
2001	26	4	34.55	0.37	34.17	34.30	34.87	34.88

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	24.43	0.69	25.07	23.48	24.42	24.76
2003	26	4	21.93	1.39C	22.70	23.49	20.62	20.90
2004	26	4	22.72	0.21	22.73	23.01	22.55	22.58
2005	26	4	22.03	0.73	22.62	21.95	22.53	21.02
2006	26	4	22.50	0.73	23.45	22.69	21.86	22.00
2001	27	4	34.33	0.38	34.79	34.40	34.21	33.90
2002	27	4	23.91	0.23	23.81	23.92	24.22	23.69
2003	27	4	20.79	0.30	21.05	20.37	20.81	20.92
2004	27	4	20.93	0.15	20.74	20.89	21.01	21.09
2005	27	4	20.60	0.20	20.36	20.66	20.83	20.54
2006	27	4	21.94	0.37	22.06	22.30	21.43	21.98
2001	28	4	33.52	0.44	33.60	34.03	33.48	32.97
2002	28	4	23.33	0.13	23.22	23.36	23.50	23.23
2003	28	4	20.87	0.63	20.13	20.64	21.61	21.09
2004	28	4	20.67	0.16	20.62	20.84	20.77	20.47
2005	28	4	20.77	0.40	21.33	20.64	20.71	20.39
2006	28	4	21.36	0.24	21.66	21.34	21.38	21.08
2001	29	4	31.95	0.40	32.52	31.57	31.80	31.92
2002	29	4	21.70	0.27	21.67	21.51	21.55	22.09
2003	29	4	18.89	0.29	18.58	19.21	19.05	18.74
2004	29	4	18.74	0.42	18.81	18.27	18.60	19.27
2005	29	4	20.48	0.51	19.89	20.24	20.80	21.00
2006	29	3	22.41	0.91	22.22	21.61	23.40	
2001	30	4	34.79	0.13	34.66	34.96	34.75	34.77
2002	30	4	24.47	0.18	24.36	24.38	24.74	24.40
2003	30	4	22.46	0.27	22.68	22.23	22.72	22.23
2004	30	4	19.46	0.29	19.37	19.34	19.89	19.25
2005	30	4	20.73	0.29	21.02	20.34	20.71	20.85
2006	30	4	22.53	0.15	22.48	22.57	22.70	22.35
2001	31	4	34.41	0.57	33.70	34.52	35.09	34.34
2002	31	4	24.18	0.24	24.45	24.16	23.87	24.23
2003	31	4	21.30	0.11	21.31	21.42	21.15	21.31
2004	31	4	21.82	0.27	21.46	21.75	22.01	22.05
2005	31	4	21.55	0.24	21.63	21.18	21.72	21.65
2006	31	4	22.56	0.23	22.64	22.56	22.24	22.79
2001	32	4	32.58	0.62	32.65	31.83	33.35	32.49
2002	32	4	22.04	0.39	21.50	22.06	22.42	22.19
2003	32	4	19.36	0.19	19.28	19.20	19.33	19.63
2004	32	4	20.29	0.26	20.09	20.64	20.33	20.09
2005	32	4	20.55	0.29	20.76	20.48	20.17	20.78
2006	32	4	21.37	0.26	21.74	21.21	21.36	21.17
2001	33	4	31.35	0.31	31.09	31.80	31.27	31.24
2002	33	4	21.42	0.12	21.42	21.58	21.33	21.35
2003	33	4	18.86	0.84	18.96	19.70	19.10	17.69
2004	33	4	18.93	0.40	19.22	18.73	18.47	19.31
2005	33	4	19.15	0.64	19.09	18.51	20.04	18.96
2006	33	4	19.24	0.67	18.30	19.22	19.82	19.64
2001	34	4	36.07	0.53	35.73	36.35	36.67	35.54
2002	34	4	24.99	0.31	25.27	24.58	24.92	25.18
2003	34	4	21.85	0.27	22.24	21.81	21.68	21.67
2004	34	4	22.05	0.28	22.13	22.29	21.65	22.13
2005	34	4	22.34	0.23	22.24	22.30	22.14	22.66
2006	34	4	22.68	0.71	22.06	23.37	22.09	23.21

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	32.90	0.45	32.94	33.15	32.25	33.25		
2002	35	4	23.54	0.70	24.09	22.52	23.76	23.80		
2003	35	4	20.42	0.46	20.92	19.98	20.10	20.68		
2004	35	4	21.27	0.29	21.50	20.85	21.31	21.43		
2005	35	4	21.10	0.58	20.97	21.72	20.36	21.36		
2006	35	4	21.02	0.21	20.94	21.33	20.96	20.86		
2001	36	4	34.93	0.23	34.91	34.69	34.88	35.24		
2002	36	4	24.41	0.35	23.96	24.34	24.58	24.78		
2003	36	4	20.45	0.13	20.34	20.33	20.52	20.60		
2004	36	4	21.85	0.53	21.08	22.26	21.90	22.16		
2005	36	4	21.80	0.58	21.58	21.20	21.86	22.56		
2006	36	4	21.30	0.35	21.27	21.04	21.08	21.80		
2001	37	6	35.22	0.72	35.95	34.88	35.14	36.08	35.18	34.11
2002	37	6	23.06	0.44	22.90	23.42	22.33	22.90	23.41	23.43
2003	37	6	19.34	0.31	19.58	19.29	19.31	19.37	19.70	18.80
2004	37	6	19.46	0.35	19.52	20.08	19.22	19.10	19.54	19.30
2005	37	6	20.02	0.32	20.23	19.70	19.80	19.70	20.40	20.29
2006	37	6	20.24	0.48	19.80	19.96	20.34	20.03	20.15	21.15
2001	38	4	35.25	0.62	34.60	35.31	36.08	35.02		
2002	38	4	24.75	0.66	23.98	24.46	25.13	25.44		
2003	38	4	21.55	0.41	21.65	21.55	21.00	21.99		
2004	38	4	21.69	0.42	21.83	22.21	21.45	21.27		
2005	38	4	21.52	0.16	21.58	21.28	21.61	21.61		
2006	38	4	22.54	0.95	22.02	22.67	21.64	23.81		
2001	40	4	34.62	1.10 c	33.31	35.77	35.24	34.17		
2002	40	4	23.40	0.54	23.36	22.93	23.15	24.18		
2003	40	4	20.45	0.61	20.07	20.79	21.12	19.82		
2004	40	4	20.95	0.71	20.07	21.75	20.80	21.19		
2005	40	4	20.54	0.78	19.76	21.58	20.21	20.62		
2006	40	4	21.04	0.94	19.79	21.88	20.88	21.62		
2001	113	4	34.00	0.11	33.86	33.98	34.12	34.03		
2002	113	4	20.74	0.16	20.93	20.81	20.69	20.54		
2003	113	5	19.23	0.50	19.43	19.47	19.48	19.43	18.32	
2004	113	5	18.18	0.10	18.12	18.15	18.35	18.13	18.14	
2005	113	5	19.20	0.08	19.21	19.07	19.30	19.23	19.18	
2006	113	5	19.65	0.07	19.72	19.59	19.57	19.65	19.71	
2001	137	6	35.52	0.64	36.34	35.12	35.44	36.23	35.29	34.69
2002	137	6	23.41	0.58	23.11	24.09	22.62	22.99	23.86	23.77
2003	137	6	19.78	0.44	20.43	19.66	19.48	19.85	20.08	19.19
2004	137	6	19.79	0.34	19.52	20.40	19.75	19.44	19.73	19.87
2005	137	6	20.18	0.32	20.24	19.89	20.07	19.81	20.65	20.40
2006	137	6	20.50	0.51	20.41	20.01	20.44	20.24	20.39	21.50

18.9 ADL

18.9.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	0.95	0.45	0.10	-0.21	-0.19	-0.20
3	-0.67	-0.00	1.04	0.51	0.27	0.92
5	-0.99	-1.60	-1.77	-1.32	-1.23	-1.58
6	0.30	1.43	1.27	0.58	0.45	0.66
7	-0.62	-0.30	-0.31	-0.20	-0.11	-0.46
8	-0.24	0.05	-0.16	-0.49	-0.47	-0.24
9	-0.37	0.19	-0.48	-0.28	-0.16	-0.38
10	-0.33	0.15	-0.24	-0.40	-0.25	-0.09
13	-0.33	0.24	-0.18	0.42	-0.46	0.28
14	-0.44	-0.01	0.08	0.29	0.19	-0.27
15	-1.04	-0.56	-0.67	-0.54	-0.79	-0.83
17	-1.03	-0.43	-0.85	0.66	-0.24	-0.15
18	0.13	-0.01	0.27	-0.19	-0.67	-0.47
19	0.40	0.57	0.74	0.16	-0.62	-0.31
20	0.49	-0.11	0.03	-0.54	-0.63	-0.36
22	2.25	2.83	2.70	1.90	1.98	1.74
23	-0.90	0.25	-0.08	0.24	-0.21	0.25
24	-1.04	-1.12	-0.16	-0.61	-0.03	-0.46
25	-0.47	-0.78	-0.54	-0.94	-0.59	-0.45
26	-0.92	-0.11	-0.26	-0.26	-0.16	0.20
27	0.04	0.21	-0.10	-0.12	-0.31	-0.44
28	-0.29	0.06	0.30	0.06	0.00	0.04
29	0.40	0.98	0.33	0.20	0.38	1.03
30	2.45	4.37	4.28	1.87	2.35	2.41
31	-0.50	0.10	-0.01	0.22	0.61	0.16
32	-0.67	-0.52	0.32	0.51	1.17	0.54
33	2.56	4.39	4.43	2.91	2.66	2.44
34	0.11	-0.30	0.43	-0.64	-0.42	-0.32
35	-0.91	-0.04	0.04	-0.37	0.18	-0.18
36	0.59	1.08	1.66	0.90	1.48	1.19
37	0.41	-1.24	-1.87	-1.92	-1.55	-1.70
38	-0.42	0.48	0.08	0.21	-0.26	-0.31
40	-0.49	-1.08	-1.36	-0.96	-0.98	-1.20
113	0.45	-0.73	0.21	-0.59	-0.48	-0.50
137	1.14	-0.11	-0.53	-1.05	-0.89	-0.94

18.9.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	3.24	0.06	3.20	3.23	3.33	3.20
2002	1	4	1.79	0.03	1.76	1.80	1.82	1.76
2003	1	4	1.56	0.03	1.60	1.57	1.56	1.52
2004	1	4	1.42	0.05	1.46	1.46	1.42	1.34
2005	1	4	1.43	0.05	1.50	1.42	1.38	1.43
2006	1	4	1.35	0.05	1.28	1.38	1.37	1.38
2001	3	4	2.86	0.12	2.69	2.88	2.89	2.97
2002	3	4	1.72	0.09	1.70	1.69	1.64	1.86
2003	3	4	1.71	0.03	1.71	1.73	1.74	1.66

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	1.55	0.07	1.65	1.49	1.56	1.49
2005	3	4	1.53	0.06	1.58	1.51	1.44	1.57
2006	3	4	1.59	0.07	1.63	1.56	1.66	1.52
2001	5	4	2.78	0.10	2.88	2.74	2.85	2.66
2002	5	4	1.50	0.07	1.49	1.54	1.41	1.57
2003	5	4	1.27	0.06	1.19	1.33	1.30	1.29
2004	5	4	1.22	0.05	1.18	1.29	1.18	1.22
2005	5	4	1.22	0.03	1.24	1.19	1.20	1.25
2006	5	4	1.05	0.03	1.06	1.01	1.08	1.05
2001	6	4	3.09	0.05	3.04	3.16	3.06	3.08
2002	6	4	1.92	0.05	1.95	1.87	1.97	1.90
2003	6	4	1.75	0.11	1.59	1.83	1.75	1.80
2004	6	4	1.56	0.05	1.56	1.49	1.57	1.62
2005	6	4	1.56	0.07	1.53	1.50	1.57	1.66
2006	6	4	1.54	0.05	1.48	1.55	1.60	1.52
2001	7	4	2.87	0.13	2.75	2.77	2.97	2.99
2002	7	4	1.68	0.13	1.78	1.49	1.75	1.71
2003	7	4	1.50	0.06	1.43	1.48	1.52	1.57
2004	7	4	1.42	0.11	1.57	1.30	1.39	1.42
2005	7	4	1.45	0.12	1.31	1.43	1.45	1.61
2006	7	4	1.29	0.08	1.21	1.29	1.28	1.40
2001	8	4	2.96	0.10	3.00	2.92	2.85	3.07
2002	8	4	1.73	0.08	1.71	1.76	1.64	1.82
2003	8	4	1.52	0.03	1.51	1.53	1.56	1.50
2004	8	4	1.37	0.02	1.38	1.36	1.34	1.38
2005	8	4	1.37	0.10	1.40	1.47	1.40	1.23
2006	8	4	1.34	0.04	1.35	1.30	1.39	1.33
2001	9	4	2.93	0.10	2.80	2.91	2.97	3.03
2002	9	4	1.75	0.05	1.77	1.76	1.68	1.80
2003	9	4	1.47	0.03	1.51	1.48	1.45	1.45
2004	9	4	1.40	0.05	1.44	1.40	1.34	1.45
2005	9	4	1.44	0.06	1.49	1.39	1.39	1.48
2006	9	4	1.31	0.09	1.35	1.18	1.36	1.36
2001	10	4	2.94	0.03	2.93	2.97	2.91	2.95
2002	10	4	1.75	0.08	1.78	1.79	1.63	1.78
2003	10	4	1.51	0.04	1.46	1.50	1.54	1.54
2004	10	4	1.38	0.06	1.39	1.43	1.30	1.42
2005	10	4	1.42	0.01	1.43	1.41	1.41	1.43
2006	10	4	1.38	0.05	1.35	1.40	1.32	1.43
2001	13	4	2.94	0.03	2.93	2.96	2.90	2.96
2002	13	4	1.76	0.02	1.77	1.73	1.77	1.76
2003	13	4	1.52	0.03	1.50	1.53	1.56	1.50
2004	13	4	1.53	0.01	1.54	1.54	1.53	1.52
2005	13	4	1.38	0.02	1.35	1.39	1.40	1.36
2006	13	4	1.45	0.01	1.45	1.45	1.45	1.47
2001	14	4	2.91	0.22C	2.58	3.04	3.04	2.98
2002	14	4	1.72	0.05	1.67	1.70	1.78	1.74
2003	14	4	1.56	0.03	1.52	1.55	1.58	1.59
2004	14	4	1.51	0.04	1.53	1.53	1.45	1.52
2005	14	4	1.51	0.03	1.52	1.48	1.53	1.52
2006	14	4	1.34	0.05	1.27	1.37	1.32	1.39
2001	15	4	2.77	0.04	2.79	2.81	2.71	2.77
2002	15	4	1.65	0.10	1.71	1.74	1.62	1.52

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	1.44	0.10	1.41	1.32	1.51	1.54
2004	15	4	1.36	0.12	1.42	1.18	1.44	1.40
2005	15	4	1.31	0.03	1.33	1.27	1.33	1.31
2006	15	4	1.21	0.09	1.13	1.34	1.18	1.20
2001	17	4	2.77	0.11	2.80	2.89	2.63	2.78
2002	17	4	1.67	0.09	1.62	1.61	1.80	1.63
2003	17	4	1.42	0.20C	1.51	1.11	1.50	1.54
2004	17	4	1.58	0.09	1.67	1.46	1.62	1.55
2005	17	4	1.42	0.07	1.36	1.38	1.53	1.42
2006	17	4	1.36	0.10	1.36	1.23	1.48	1.38
2001	18	4	3.05	0.03	3.06	3.00	3.07	3.05
2002	18	4	1.72	0.07	1.65	1.77	1.68	1.79
2003	18	4	1.59	0.05	1.65	1.59	1.58	1.54
2004	18	4	1.42	0.05	1.42	1.40	1.37	1.50
2005	18	4	1.33	0.04	1.32	1.37	1.27	1.36
2006	18	4	1.29	0.06	1.26	1.37	1.23	1.31
2001	19	4	3.11	0.03	3.14	3.07	3.10	3.13
2002	19	4	1.80	0.03	1.77	1.81	1.78	1.84
2003	19	4	1.66	0.10	1.75	1.74	1.58	1.57
2004	19	4	1.48	0.06	1.50	1.43	1.44	1.56
2005	19	4	1.34	0.04	1.31	1.39	1.31	1.38
2006	19	4	1.33	0.09	1.28	1.42	1.22	1.39
2001	20	4	3.13	0.03	3.12	3.13	3.17	3.10
2002	20	4	1.71	0.04	1.66	1.74	1.69	1.75
2003	20	4	1.55	0.09	1.68	1.49	1.53	1.50
2004	20	4	1.36	0.03	1.38	1.33	1.33	1.39
2005	20	4	1.34	0.04	1.39	1.29	1.33	1.36
2006	20	4	1.32	0.02	1.29	1.34	1.32	1.31
2001	22	4	3.55	0.16	3.76	3.53	3.38	3.52
2002	22	4	2.12B	0.08	2.12	2.21	2.13	2.01
2003	22	4	1.97 b	0.07	1.99	1.88	2.05	1.95
2004	22	4	1.80	0.08	1.90	1.71	1.82	1.76
2005	22	4	1.88	0.07	1.97	1.90	1.80	1.84
2006	22	4	1.77	0.06	1.86	1.77	1.73	1.73
2001	23	4	2.80	0.02	2.82	2.81	2.78	2.80
2002	23	4	1.76	0.07	1.69	1.85	1.75	1.75
2003	23	4	1.54	0.13	1.42	1.53	1.72	1.47
2004	23	4	1.50	0.08	1.45	1.45	1.61	1.48
2005	23	4	1.43	0.09	1.46	1.42	1.31	1.52
2006	23	4	1.45	0.03	1.48	1.43	1.43	1.46
2001	24	4	2.77	0.07	2.80	2.73	2.70	2.85
2002	24	4	1.57	0.08	1.55	1.65	1.47	1.61
2003	24	4	1.52	0.12	1.40	1.59	1.46	1.65
2004	24	4	1.34	0.06	1.42	1.31	1.28	1.36
2005	24	4	1.46	0.06	1.43	1.42	1.46	1.54
2006	24	4	1.29	0.05	1.22	1.28	1.34	1.33
2001	25	4	2.90	0.01	2.89	2.91	2.90	2.91
2002	25	4	1.62	0.03	1.62	1.62	1.65	1.58
2003	25	4	1.47	0.02	1.49	1.46	1.47	1.44
2004	25	4	1.29	0.04	1.34	1.25	1.25	1.29
2005	25	4	1.35	0.04	1.33	1.32	1.40	1.35
2006	25	4	1.30	0.03	1.28	1.28	1.33	1.30
2001	26	4	2.80	0.13	2.66	2.96	2.84	2.73

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	1.71	0.06	1.70	1.77	1.74	1.63
2003	26	4	1.51	0.12	1.54	1.54	1.61	1.34
2004	26	4	1.41	0.06	1.47	1.34	1.45	1.38
2005	26	4	1.44	0.06	1.35	1.50	1.45	1.45
2006	26	4	1.44	0.09	1.40	1.56	1.45	1.34
2001	27	4	3.03	0.07	3.11	3.02	3.04	2.93
2002	27	4	1.75	0.05	1.81	1.69	1.74	1.77
2003	27	4	1.53	0.03	1.50	1.53	1.56	1.55
2004	27	4	1.43	0.07	1.38	1.51	1.37	1.48
2005	27	4	1.41	0.07	1.44	1.31	1.42	1.46
2006	27	4	1.30	0.10	1.36	1.36	1.14	1.33
2001	28	4	2.95	0.05	2.99	2.88	2.98	2.95
2002	28	4	1.73	0.06	1.71	1.82	1.70	1.71
2003	28	4	1.60	0.02	1.62	1.56	1.59	1.60
2004	28	4	1.47	0.07	1.38	1.54	1.48	1.47
2005	28	4	1.47	0.05	1.51	1.40	1.51	1.47
2006	28	4	1.40	0.12	1.43	1.37	1.55	1.26
2001	29	4	3.11	0.10	3.26	3.02	3.09	3.09
2002	29	4	1.86	0.15	1.82	1.66	1.98	1.97
2003	29	4	1.60	0.12	1.65	1.62	1.70	1.42
2004	29	4	1.49	0.09	1.41	1.44	1.61	1.51
2005	29	4	1.55	0.13	1.56	1.50	1.72	1.41
2006	29	3	1.62	0.20 c	1.49	1.52	1.85	
2001	30	4	3.60 b	0.02	3.60	3.56	3.62	3.60
2002	30	0	2.33B	0.04	2.27	2.35	2.35	2.35
2003	30	0	2.21B	0.04	2.24	2.22	2.16	2.22
2004	30	4	1.79	0.02	1.82	1.79	1.77	1.80
2005	30	4	1.95 b	0.05	1.96	1.94	1.90	2.02
2006	30	4	1.92 b	0.03	1.95	1.90	1.94	1.89
2001	31	4	2.90	0.16	3.03	2.70	3.01	2.85
2002	31	4	1.74	0.24C	1.47	1.61	2.02	1.85
2003	31	4	1.55	0.06	1.60	1.54	1.58	1.46
2004	31	4	1.50	0.16 c	1.67	1.58	1.42	1.32
2005	31	4	1.60	0.05	1.59	1.67	1.59	1.54
2006	31	4	1.43	0.08	1.39	1.38	1.55	1.39
2001	32	4	2.86	0.07	2.81	2.81	2.96	2.85
2002	32	4	1.65	0.14	1.54	1.54	1.81	1.72
2003	32	4	1.60	0.02	1.61	1.62	1.58	1.57
2004	32	4	1.55	0.08	1.52	1.64	1.45	1.58
2005	32	4	1.71	0.09	1.73	1.84	1.65	1.63
2006	32	4	1.51	0.05	1.59	1.49	1.50	1.47
2001	33	4	3.62 b	0.08	3.66	3.68	3.51	3.64
2002	33	0	2.33B	0.04	2.31	2.33	2.31	2.38
2003	33	0	2.23B	0.05	2.20	2.28	2.28	2.18
2004	33	4	1.98 b	0.08	1.92	2.10	1.93	1.98
2005	33	4	2.02 b	0.06	1.95	1.98	2.05	2.08
2006	33	4	1.93 b	0.13	1.88	1.77	2.06	2.00
2001	34	4	3.04	0.08	3.02	2.99	3.00	3.15
2002	34	4	1.68	0.09	1.70	1.64	1.59	1.80
2003	34	4	1.61	0.06	1.65	1.52	1.63	1.65
2004	34	4	1.34	0.04	1.32	1.35	1.30	1.39
2005	34	4	1.39	0.13	1.57	1.28	1.41	1.28
2006	34	4	1.32	0.13	1.31	1.17	1.33	1.49

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	2.80	0.08	2.68	2.82	2.81	2.88		
2002	35	4	1.72	0.08	1.67	1.83	1.64	1.74		
2003	35	4	1.55	0.06	1.62	1.47	1.56	1.57		
2004	35	4	1.39	0.06	1.32	1.41	1.37	1.45		
2005	35	4	1.51	0.05	1.48	1.47	1.51	1.58		
2006	35	4	1.36	0.10	1.39	1.21	1.40	1.42		
2001	36	4	3.16	0.08	3.12	3.12	3.11	3.27		
2002	36	4	1.87	0.06	1.86	1.90	1.80	1.94		
2003	36	4	1.80	0.05	1.85	1.76	1.84	1.76		
2004	36	4	1.62	0.08	1.62	1.70	1.52	1.63		
2005	36	4	1.77	0.08	1.75	1.86	1.68	1.80		
2006	36	4	1.65	0.12	1.68	1.56	1.57	1.81		
2001	37	6	3.11	0.05	3.12	3.15	3.17	3.05	3.07	3.11
2002	37	6	1.55	0.09	1.59	1.50	1.40	1.64	1.60	1.58
2003	37	6	1.26	0.04	1.33	1.26	1.24	1.29	1.25	1.20
2004	37	6	1.11	0.03	1.12	1.15	1.13	1.10	1.05	1.10
2005	37	6	1.15	0.04	1.20	1.10	1.13	1.20	1.15	1.15
2006	37	6	1.03	0.09	1.01	0.88	1.01	1.14	1.01	1.11
2001	38	4	2.92	0.01	2.93	2.91	2.92	2.92		
2002	38	4	1.79	0.18 c	1.67	1.83	1.63	2.02		
2003	38	4	1.56	0.12	1.45	1.54	1.52	1.73		
2004	38	4	1.49	0.07	1.58	1.49	1.41	1.50		
2005	38	4	1.42	0.18C	1.56	1.21	1.58	1.33		
2006	38	4	1.33	0.12	1.39	1.15	1.38	1.39		
2001	40	4	2.90	0.04	2.86	2.96	2.89	2.89		
2002	40	4	1.58	0.05	1.61	1.59	1.50	1.60		
2003	40	4	1.34	0.07	1.35	1.42	1.32	1.26		
2004	40	4	1.28	0.07	1.21	1.37	1.28	1.27		
2005	40	4	1.27	0.10	1.16	1.36	1.21	1.35		
2006	40	4	1.13	0.06	1.05	1.20	1.12	1.16		
2001	113	4	3.12	0.03	3.09	3.12	3.16	3.12		
2002	113	4	1.62	0.03	1.62	1.63	1.66	1.59		
2003	113	5	1.58	0.05	1.58	1.62	1.58	1.62	1.49	
2004	113	5	1.35	0.02	1.35	1.35	1.38	1.32	1.34	
2005	113	5	1.37	0.03	1.37	1.33	1.40	1.40	1.36	
2006	113	5	1.29	0.03	1.30	1.28	1.25	1.28	1.32	
2001	137	6	3.28	0.06	3.29	3.23	3.40	3.26	3.25	3.29
2002	137	6	1.71	0.05	1.68	1.72	1.63	1.76	1.74	1.73
2003	137	6	1.47	0.09	1.61	1.45	1.35	1.47	1.50	1.41
2004	137	6	1.27	0.03	1.24	1.24	1.32	1.26	1.25	1.28
2005	137	6	1.29	0.07	1.37	1.19	1.34	1.31	1.28	1.24
2006	137	6	1.19	0.07	1.21	1.11	1.10	1.29	1.19	1.24

18.10 NDF

18.10.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-0.48	-0.80	-0.27	-0.57	-0.43	-0.06
3	-1.90	-0.79	-1.17	-1.33	-1.27	-0.66
5	1.70	1.56	1.75	2.01	1.57	1.55
6	0.42	1.84	2.77	2.03	1.96	0.97
7	-0.17	0.44	0.74	0.60	0.08	0.79
8	-0.72	-1.03	-1.44	-1.29	-1.49	-1.37
9	0.52	0.67	0.76	0.55	0.70	0.78
10	0.21	-0.13	0.18	-0.08	0.17	0.69
13	0.35	-0.14	-0.47	-0.53	0.83	-0.21
14	0.20	-0.12	0.07	0.25	0.15	0.31
15	0.14	0.78	0.91	0.43	0.61	-0.92
17	0.23	1.70	2.16	1.95	1.67	0.79
18	0.16	-0.19	-0.04	-0.13	0.11	-0.41
19	-0.31	-0.71	-0.10	-0.37	0.05	-0.47
20	-0.53	-0.56	-0.74	-0.58	-0.48	-0.80
22	-0.71	-0.98	-1.64	-1.24	-1.25	-1.15
23	-0.69	0.07	-0.40	-0.48	0.28	0.04
24	0.27	0.01	0.48	0.19	0.33	0.36
25	-0.00	-0.32	-0.57	-0.46	-0.32	-0.60
26	-0.97	-0.39	-0.36	0.59	-0.06	-0.19
27	0.51	0.68	0.31	0.18	-0.27	0.44
28	0.38	0.79	0.59	0.51	0.18	0.78
29	-1.16	-0.95	-1.10	-1.50	-0.02	1.29
30	-1.66	-1.68	-1.28	-4.58	-2.87	-2.38
31	-0.60	0.11	0.12	0.36	0.37	0.63
32	-0.87	-1.11	-0.88	-0.39	-0.28	0.30
33	-0.82	-1.17	-0.97	-1.14	-1.39	-1.52
34	1.73	1.39	0.82	0.71	0.87	0.80
35	-1.09	-0.09	-0.31	0.33	0.56	-0.10
36	0.63	0.19	-0.69	0.42	0.23	-0.57
37	1.38	0.20	-0.41	-0.50	-0.24	-0.20
38	1.35	1.79	1.28	0.95	0.17	1.76
40	0.89	0.45	0.56	0.71	0.39	0.20
113	0.29	-1.50	-0.18	-1.62	-0.54	-0.57
137	1.30	-0.00	-0.48	-0.55	-0.38	-0.31

18.10.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	55.23	0.16	55.26	55.16	55.06	55.44
2002	1	4	40.15	0.41	39.98	39.79	40.09	40.74
2003	1	4	36.92	0.09	37.05	36.89	36.90	36.83
2004	1	4	36.17	0.31	36.42	35.72	36.24	36.30
2005	1	4	36.85	0.80	37.82	36.08	37.17	36.33
2006	1	4	38.61	0.41	38.20	38.38	38.75	39.12
2001	3	4	52.75	0.52	52.05	53.31	52.72	52.91
2002	3	4	40.17	0.45	39.60	40.51	40.54	40.03
2003	3	4	35.34	0.43	35.23	35.97	35.07	35.07

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	34.85	0.19	35.03	34.66	35.00	34.70
2005	3	4	35.37	0.20	35.37	35.47	35.10	35.56
2006	3	4	37.55	0.79	37.97	36.67	38.41	37.16
2001	5	4	59.04	0.26	59.37	59.11	58.75	58.94
2002	5	4	44.28	0.24	44.53	44.16	44.42	44.00
2003	5	4	40.45	0.28	40.39	40.65	40.69	40.09
2004	5	4	40.69	0.37	40.16	40.91	40.98	40.72
2005	5	4	40.34	0.26	40.14	40.23	40.71	40.26
2006	5	4	41.43	0.44	41.76	41.14	41.84	40.97
2001	6	4	56.81	1.19	55.89	55.69	57.56	58.08
2002	6	4	44.78	0.34	44.31	45.08	45.00	44.73
2003	6	4	42.24	0.43	41.71	42.39	42.12	42.72
2004	6	4	40.72	1.12	39.74	42.17	39.95	41.02
2005	6	4	41.02	0.92	39.72	41.84	41.44	41.08
2006	6	4	40.42	0.80	40.93	41.22	39.48	40.02
2001	7	4	55.77	0.11	55.78	55.71	55.67	55.92
2002	7	4	42.32	0.59	41.57	42.93	42.61	42.18
2003	7	4	38.68	0.32	38.65	38.88	38.95	38.25
2004	7	4	38.23	1.08	39.59	37.64	37.12	38.55
2005	7	4	37.73	0.32	38.02	37.65	37.95	37.32
2006	7	4	40.09	0.35	40.09	39.72	39.98	40.56
2001	8	4	54.80	0.23	54.78	54.56	55.12	54.76
2002	8	4	39.74	0.44	40.26	39.76	39.77	39.18
2003	8	4	34.86	0.75	35.94	34.78	34.40	34.31
2004	8	4	34.92	0.40	34.46	35.38	35.08	34.76
2005	8	4	34.98	0.24	35.31	34.74	34.94	34.94
2006	8	4	36.32	0.93	35.63	35.43	37.34	36.88
2001	9	4	56.97	0.42	56.77	57.00	57.55	56.58
2002	9	4	42.72	0.29	42.87	42.29	42.90	42.83
2003	9	4	38.72	0.81	39.10	39.23	37.50	39.04
2004	9	4	38.14	0.55	38.42	38.60	37.35	38.20
2005	9	4	38.82	0.35	38.65	38.78	38.53	39.33
2006	9	4	40.07	0.48	39.65	40.03	39.85	40.75
2001	10	4	56.44	0.58	56.25	56.54	55.78	57.16
2002	10	4	41.33	0.60	41.08	40.85	41.17	42.21
2003	10	4	37.70	0.59	37.93	36.83	37.93	38.10
2004	10	4	37.03	0.40	37.35	37.16	36.45	37.17
2005	10	4	37.89	0.12	38.02	37.78	37.79	37.95
2006	10	4	39.92	0.50	40.32	40.36	39.32	39.68
2001	13	4	56.67	0.19	56.56	56.48	56.91	56.74
2002	13	4	41.30	0.07	41.28	41.37	41.21	41.34
2003	13	4	36.56	0.20	36.75	36.71	36.35	36.44
2004	13	4	36.24	0.06	36.16	36.26	36.31	36.23
2005	13	4	39.06	0.09	39.16	38.97	39.11	38.99
2006	13	4	38.34	0.13	38.45	38.41	38.15	38.36
2001	14	4	56.42	0.43	56.57	55.82	56.47	56.83
2002	14	4	41.35	0.61	41.60	40.47	41.88	41.45
2003	14	4	37.50	0.47	36.97	37.24	37.94	37.85
2004	14	4	37.62	0.46	36.97	37.88	38.00	37.62
2005	14	4	37.85	0.73	38.74	37.41	38.12	37.12
2006	14	4	39.26	0.61	39.12	39.68	39.78	38.46
2001	15	4	56.31	0.53	57.07	56.04	55.89	56.25
2002	15	4	42.91	0.77	43.91	43.05	42.56	42.13

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	38.97	1.24	39.45	37.12	39.78	39.53
2004	15	4	37.92	0.82	38.50	36.80	38.56	37.81
2005	15	4	38.65	0.62	38.11	38.78	38.25	39.47
2006	15	4	37.10	1.05	35.76	36.82	37.72	38.10
2001	17	4	56.47	0.17	56.53	56.66	56.26	56.45
2002	17	4	44.53	0.17	44.38	44.73	44.42	44.62
2003	17	4	41.16	0.39	40.73	41.52	40.94	41.44
2004	17	4	40.59	0.36	40.96	40.13	40.75	40.51
2005	17	4	40.51	0.67	41.30	39.84	40.82	40.09
2006	17	4	40.09	0.57	39.92	40.59	39.37	40.50
2001	18	4	56.34	0.60	56.64	56.25	56.94	55.54
2002	18	4	41.21	0.18	41.03	41.46	41.24	41.13
2003	18	4	37.31	0.14	37.48	37.18	37.22	37.37
2004	18	4	36.94	0.83	36.30	36.14	37.59	37.73
2005	18	4	37.79	0.38	38.13	37.79	37.25	37.99
2006	18	4	37.99	0.62	38.39	38.03	38.45	37.10
2001	19	4	55.52	0.78	55.54	55.70	56.35	54.48
2002	19	4	40.31	0.35	40.43	40.73	40.16	39.91
2003	19	4	37.21	0.24	36.93	37.22	37.51	37.18
2004	19	4	36.52	0.77	35.95	35.77	37.27	37.09
2005	19	4	37.68	0.27	37.88	37.65	37.31	37.87
2006	19	4	37.89	0.66	38.23	37.91	38.45	36.96
2001	20	4	55.14	0.74	55.14	55.38	55.90	54.14
2002	20	4	40.58	0.27	40.48	40.98	40.47	40.39
2003	20	4	36.09	0.58	35.30	36.04	36.38	36.64
2004	20	4	36.15	0.96	35.70	35.21	36.28	37.43
2005	20	4	36.76	0.50	36.79	37.03	36.04	37.17
2006	20	4	37.32	0.82	37.95	37.27	37.88	36.17
2001	22	4	54.82	1.09	55.73	53.52	54.32	55.72
2002	22	4	39.83	0.74	40.64	40.20	38.96	39.51
2003	22	4	34.52	0.34	34.45	34.08	34.83	34.73
2004	22	4	35.00	0.70	34.71	34.20	35.84	35.24
2005	22	4	35.41	0.77	35.56	36.29	35.38	34.41
2006	22	4	36.70	0.68	36.18	36.29	37.68	36.65
2001	23	4	54.86	0.65	54.82	55.75	54.19	54.68
2002	23	4	41.68	0.26	41.41	41.58	41.73	42.01
2003	23	4	36.69	2.20C	35.31	38.27	38.84	34.35
2004	23	4	36.33	0.53	35.77	36.01	36.57	36.95
2005	23	4	38.09	1.65	40.25	36.63	36.99	38.47
2006	23	4	38.77	0.76	38.68	37.95	39.79	38.68
2001	24	4	56.54	0.32	56.38	56.74	56.17	56.87
2002	24	4	41.58	0.15	41.74	41.64	41.51	41.41
2003	24	4	38.22	0.59	37.52	38.26	38.16	38.95
2004	24	4	37.51	0.30	37.92	37.51	37.21	37.40
2005	24	4	38.18	0.18	38.35	38.32	38.06	37.98
2006	24	4	39.34	0.36	39.42	39.71	38.85	39.39
2001	25	4	56.06	0.22	55.84	55.90	56.23	56.27
2002	25	4	40.99	0.19	41.15	41.08	40.71	41.02
2003	25	4	36.38	1.06	35.39	37.34	37.26	35.53
2004	25	4	36.36	0.90	36.35	37.37	36.53	35.19
2005	25	4	37.04	0.44	37.03	36.65	37.65	36.81
2006	25	4	37.67	0.50	38.28	37.76	37.07	37.55
2001	26	4	54.36	0.49	53.83	54.63	54.90	54.10

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	40.87	0.78	41.71	40.15	41.36	40.28
2003	26	4	36.75	1.70 c	37.69	38.63	35.73	34.97
2004	26	4	38.20	0.33	38.66	37.98	37.93	38.24
2005	26	4	37.49	0.29	37.66	37.31	37.81	37.20
2006	26	4	38.37	1.14	39.10	39.37	38.18	36.85
2001	27	4	56.96	0.29	57.33	56.85	57.04	56.63
2002	27	4	42.75	0.47	42.60	43.23	42.99	42.16
2003	27	4	37.93	0.23	37.63	37.88	38.14	38.08
2004	27	4	37.48	0.34	37.18	37.24	37.57	37.93
2005	27	4	37.13	0.40	36.81	36.92	37.71	37.08
2006	27	4	39.47	0.54	39.54	40.17	38.90	39.28
2001	28	4	56.74	1.23	56.84	57.98	57.09	55.04
2002	28	4	42.93	0.24	43.26	42.93	42.72	42.82
2003	28	4	38.42	1.18	37.64	37.70	40.16	38.19
2004	28	4	38.06	0.32	37.78	38.15	38.48	37.84
2005	28	4	37.91	0.56	38.55	37.60	38.18	37.31
2006	28	4	40.08	0.69	39.23	40.26	39.92	40.89
2001	29	4	54.03	0.92	53.58	53.62	55.42	53.52
2002	29	4	39.89	0.60	39.37	39.62	39.84	40.74
2003	29	4	35.45	0.47	35.47	34.79	35.82	35.73
2004	29	4	34.55	0.70	35.21	33.58	34.88	34.53
2005	29	4	37.56	1.51	36.89	35.85	38.19	39.32
2006	29	3	40.96	1.81	40.37	39.53	43.00	
2001	30	4	53.16	0.46	53.04	53.74	53.22	52.62
2002	30	4	38.62	0.32	38.40	38.96	38.82	38.30
2003	30	4	35.15	0.37	35.40	35.28	35.30	34.59
2004	30	0	29.16B	0.41	29.31	28.94	29.67	28.73
2005	30	4	32.57 b	0.42	33.04	32.15	32.79	32.31
2006	30	4	34.54	0.23	34.65	34.49	34.79	34.24
2001	31	4	55.01	1.55	53.24	54.29	56.74	55.76
2002	31	4	41.74	1.15	41.14	41.67	40.76	43.37
2003	31	4	37.60	0.41	37.74	38.07	37.47	37.10
2004	31	4	37.80	0.62	37.12	38.61	37.67	37.80
2005	31	4	38.25	0.47	38.45	38.05	37.70	38.79
2006	31	4	39.82	0.53	40.03	40.28	39.06	39.88
2001	32	4	54.54	1.12	54.47	53.65	56.13	53.90
2002	32	4	39.61	0.68	38.84	39.41	40.47	39.72
2003	32	4	35.84	0.26	36.11	35.85	35.90	35.48
2004	32	4	36.49	0.74	35.68	37.06	37.15	36.05
2005	32	4	37.11	0.57	37.82	36.56	36.73	37.31
2006	32	4	39.23	0.92	39.83	40.08	38.05	38.98
2001	33	4	54.63	0.55	54.36	54.93	55.22	53.99
2002	33	4	39.51	1.02	40.29	40.38	38.23	39.14
2003	33	4	35.68	0.85	35.55	36.84	35.57	34.77
2004	33	4	35.18	0.91	36.30	34.65	34.26	35.50
2005	33	4	35.17	1.20	34.16	34.66	36.91	34.95
2006	33	4	36.04	1.40	34.34	35.78	37.73	36.32
2001	34	4	59.10	0.31	58.80	59.48	59.20	58.90
2002	34	4	43.99	1.71C	44.38	42.89	42.44	46.23
2003	34	4	38.82	0.88	39.46	39.55	38.62	37.67
2004	34	4	38.41	1.71 c	39.34	38.23	36.09	39.98
2005	34	4	39.12	2.22C	39.34	37.73	37.23	42.17
2006	34	4	40.11	1.21	38.94	41.70	40.32	39.47

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	54.16	0.65	54.10	54.91	53.34	54.30		
2002	35	4	41.39	0.68	41.98	40.51	41.19	41.88		
2003	35	4	36.84	1.25	38.52	35.78	35.98	37.09		
2004	35	4	37.75	0.76	37.59	36.96	37.66	38.78		
2005	35	4	38.57	0.41	38.54	38.67	38.04	39.04		
2006	35	4	38.54	0.56	39.26	37.91	38.38	38.59		
2001	36	4	57.17	0.15	57.10	57.39	57.13	57.05		
2002	36	4	41.88	0.63	41.35	41.84	41.56	42.78		
2003	36	4	36.18	0.37	36.29	35.88	36.67	35.90		
2004	36	4	37.90	0.62	37.28	38.48	37.45	38.39		
2005	36	4	38.00	0.91	37.51	37.53	37.59	39.37		
2006	36	4	37.72	0.55	36.95	38.13	37.68	38.11		
2001	37	6	58.49	0.95	59.73	57.77	58.38	59.51	58.17	57.35
2002	37	6	41.90	0.45	41.86	42.20	41.28	41.49	42.44	42.15
2003	37	6	36.66	0.55	37.19	36.12	36.30	36.65	37.47	36.24
2004	37	6	36.29	0.51	36.17	37.00	36.52	35.55	36.55	35.97
2005	37	6	37.17	0.46	37.24	37.01	37.03	36.45	37.74	37.54
2006	37	6	38.35	0.65	38.52	38.53	38.31	37.52	37.84	39.39
2001	38	4	58.43	1.43	59.14	56.30	59.32	58.95		
2002	38	4	44.68	1.86C	43.87	42.46	46.41	45.99		
2003	38	4	39.62	1.26	40.75	40.55	39.12	38.08		
2004	38	4	38.83	0.78	39.88	38.77	37.99	38.67		
2005	38	4	37.88	1.76C	39.74	35.68	37.39	38.72		
2006	38	4	41.79	2.08 c	40.98	39.88	41.60	44.72		
2001	40	4	57.63	1.53	55.80	59.21	58.49	57.01		
2002	40	4	42.33	0.95	42.41	41.58	41.70	43.64		
2003	40	4	38.36	1.22	37.33	39.01	39.76	37.36		
2004	40	4	38.42	1.48	36.37	39.67	38.34	39.29		
2005	40	4	38.27	1.26	36.92	39.70	37.57	38.88		
2006	40	4	39.05	1.93	36.69	40.85	38.31	40.37		
2001	113	4	56.58	0.14	56.69	56.44	56.71	56.47		
2002	113	4	38.92	0.05	38.94	38.98	38.87	38.89		
2003	113	5	37.06	0.77	37.31	37.58	37.34	37.39	35.70	
2004	113	5	34.34	0.15	34.54	34.39	34.36	34.22	34.17	
2005	113	5	36.64	0.09	36.79	36.65	36.61	36.62	36.53	
2006	113	5	37.72	0.08	37.69	37.67	37.64	37.84	37.73	
2001	137	6	58.35	1.22	59.94	57.59	58.39	59.57	57.86	56.73
2002	137	6	41.55	0.85	41.66	42.30	40.31	40.74	42.41	41.90
2003	137	6	36.55	0.59	37.06	36.35	36.71	36.52	37.13	35.51
2004	137	6	36.21	0.69	35.99	37.25	36.44	35.11	36.22	36.22
2005	137	6	36.93	0.44	37.16	37.15	36.35	36.40	37.29	37.23
2006	137	6	38.17	0.73	38.46	37.44	38.35	37.55	37.84	39.40

18.11 ADFom

18.11.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	-0.08	-0.76	-0.48	-0.71	-0.62	-0.33
3	-1.86	-0.67	-1.20	-0.98	-1.39	-0.64
5	1.64	0.93	1.15	2.10	0.89	1.50
6	-1.32	-0.12	-0.42	-0.02	-0.28	-0.64
7	0.07	0.28	0.45	0.84	0.19	0.84
8	-0.97	-1.01	-1.29	-1.22	-1.32	-1.24
9	0.50	0.90	1.06	0.93	0.87	1.01
10	-0.32	-0.26	0.34	0.21	0.43	0.50
13	1.39	0.48	-0.16	0.01	1.04	0.23
14	-0.44	-0.40	-0.44	-0.38	-0.35	-0.32
15	-0.27	0.74	0.71	0.35	0.48	-0.62
17	0.10	1.51	1.81	1.80	1.33	0.64
18	-0.17	-0.28	-0.71	-0.38	0.07	-0.91
19	-0.45	-0.56	-0.94	-0.68	-0.12	-1.10
20	-0.19	-0.71	-1.16	-0.77	-0.58	-1.12
22	-0.83	-0.60	-1.25	-0.83	-1.02	-0.71
23	1.01	1.76	1.39	1.45	1.99	1.68
24	-0.43	0.07	0.61	0.26	0.32	0.80
25	-0.19	-0.39	-0.71	-0.18	-0.25	-0.67
26	0.07	0.93	1.51	2.10	1.37	1.26
27	0.12	0.41	0.25	0.12	-0.33	0.59
28	-0.32	-0.06	0.28	0.08	-0.17	-0.07
29	-1.31	-0.95	-1.04	-1.58	-0.21	1.40
30	-1.50	-1.39	-0.06	-3.67	-2.06	-1.23
31	-0.31	0.66	0.71	0.97	0.42	0.79
32	-0.96	-0.93	-0.78	-0.20	-0.68	-0.01
33	-1.12	-0.82	-0.43	-0.60	-0.63	-0.99
34	0.71	0.34	0.26	0.28	0.26	0.27
35	-1.23	-0.07	0.18	0.59	0.23	-0.35
36	1.06	1.13	0.53	1.44	1.09	0.23
37	2.72	0.65	-0.21	-0.36	-0.06	-0.23
38	0.70	0.39	0.40	0.15	0.04	0.44
40	0.66	0.28	0.30	0.76	0.02	0.25
113	0.90	-1.94	-0.40	-1.44	-0.85	-0.85
137	2.61	0.50	-0.30	-0.42	-0.16	-0.39

18.11.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	34.29	0.23	33.96	34.30	34.45	34.43
2002	1	4	22.21	0.29	22.29	21.78	22.38	22.39
2003	1	4	19.52	0.19	19.60	19.70	19.54	19.25
2004	1	4	19.16	0.16	19.35	19.08	19.22	18.98
2005	1	4	19.67	0.64	20.35	18.99	20.05	19.28
2006	1	4	20.54	0.28	20.43	20.43	20.34	20.95
2001	3	4	32.33	0.40	31.84	32.44	32.24	32.80
2002	3	4	22.30	0.18	22.15	22.55	22.22	22.28
2003	3	4	18.73	0.37	19.09	18.75	18.22	18.84

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	18.86	0.15	19.01	18.70	18.96	18.79
2005	3	4	18.82	0.23	18.68	18.66	19.16	18.79
2006	3	4	20.20	0.36	20.66	19.78	20.24	20.11
2001	5	4	36.18	0.42	35.71	36.40	35.96	36.65
2002	5	4	24.06	0.23	24.20	23.95	24.31	23.80
2003	5	4	21.31	0.28	21.52	21.58	21.09	21.04
2004	5	4	22.24	0.29	22.14	22.34	22.58	21.91
2005	5	4	21.33	0.15	21.17	21.45	21.46	21.22
2006	5	4	22.56	0.23	22.76	22.73	22.47	22.27
2001	6	4	32.92	0.50	33.21	32.45	33.48	32.56
2002	6	4	22.90	0.16	22.97	22.80	23.10	22.74
2003	6	4	19.58	0.22	19.50	19.51	19.40	19.91
2004	6	4	19.91	0.23	19.75	20.24	19.93	19.73
2005	6	4	20.04	0.20	19.81	20.01	20.29	20.07
2006	6	4	20.20	0.24	20.19	20.08	20.54	19.99
2001	7	4	34.45	0.60	34.42	35.01	34.74	33.63
2002	7	4	23.34	0.48	22.80	23.80	23.70	23.08
2003	7	4	20.54	0.26	20.45	20.70	20.80	20.22
2004	7	4	20.86	0.63	21.70	20.99	20.29	20.46
2005	7	4	20.56	0.66	20.82	20.10	21.36	19.94
2006	7	4	21.83	0.27	22.11	21.94	21.81	21.46
2001	8	4	33.30	0.21	33.11	33.29	33.21	33.61
2002	8	4	21.92	0.26	22.26	21.98	21.63	21.83
2003	8	4	18.63	0.16	18.81	18.59	18.43	18.67
2004	8	4	18.59	0.24	18.49	18.77	18.82	18.31
2005	8	4	18.89	0.09	18.90	18.81	18.84	19.02
2006	8	4	19.54	0.25	19.43	19.32	19.89	19.52
2001	9	4	34.92	0.43	35.20	34.73	35.35	34.41
2002	9	4	24.03	0.26	23.95	23.89	24.41	23.85
2003	9	4	21.21	0.25	21.05	21.32	20.95	21.51
2004	9	4	20.96	0.39	21.10	21.20	20.38	21.15
2005	9	4	21.30	0.17	21.10	21.27	21.33	21.50
2006	9	4	22.02	0.37	21.68	22.12	21.78	22.49
2001	10	4	34.02	0.45	33.59	33.87	33.97	34.64
2002	10	4	22.76	0.21	22.80	22.48	22.76	22.99
2003	10	4	20.41	0.55	20.86	19.72	20.86	20.21
2004	10	4	20.16	0.11	20.18	20.05	20.31	20.12
2005	10	4	20.82	0.34	20.54	21.31	20.68	20.74
2006	10	4	21.46	0.17	21.59	21.50	21.55	21.21
2001	13	4	35.91	0.03	35.90	35.87	35.93	35.93
2002	13	4	23.57	0.06	23.49	23.56	23.59	23.63
2003	13	4	19.87	0.07	19.85	19.79	19.93	19.91
2004	13	4	19.95	0.05	19.89	19.93	19.98	19.99
2005	13	4	21.49	0.04	21.44	21.46	21.50	21.54
2006	13	4	21.16	0.02	21.14	21.16	21.15	21.18
2001	14	4	33.89	0.29	33.59	33.72	34.00	34.24
2002	14	4	22.60	0.50	22.96	21.94	23.01	22.47
2003	14	4	19.57	0.29	19.41	19.33	19.97	19.54
2004	14	4	19.52	0.32	19.05	19.61	19.75	19.68
2005	14	4	19.96	0.26	20.36	19.81	19.84	19.85
2006	14	4	20.55	0.45	20.22	20.69	21.13	20.17
2001	15	4	34.07	0.24	34.35	33.83	34.19	33.92
2002	15	4	23.86	0.48	24.42	23.93	23.84	23.24

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	20.83	0.66	20.70	19.98	21.53	21.10
2004	15	4	20.32	0.54	20.66	19.66	20.86	20.11
2005	15	4	20.88	0.34	20.56	21.21	20.63	21.13
2006	15	4	20.23	0.51	19.88	19.70	20.64	20.68
2001	17	4	34.48	0.40	34.16	35.06	34.29	34.43
2002	17	4	24.70	0.09	24.59	24.80	24.72	24.68
2003	17	4	22.04	0.12	22.04	22.20	21.98	21.94
2004	17	4	21.92	0.10	21.98	21.84	22.02	21.83
2005	17	4	21.81	0.31	22.17	21.45	21.93	21.71
2006	17	4	21.61	0.40	21.46	22.12	21.19	21.68
2001	18	4	34.19	0.49	34.31	34.21	34.71	33.53
2002	18	4	22.73	0.22	22.51	22.82	22.99	22.61
2003	18	4	19.27	0.15	19.25	19.16	19.17	19.49
2004	18	4	19.52	0.76	19.12	18.67	20.34	19.94
2005	18	4	20.43	0.41	20.91	20.05	20.61	20.14
2006	18	4	19.90	0.99	20.12	19.54	21.15	18.81
2001	19	4	33.88	0.55	34.01	33.96	34.44	33.13
2002	19	4	22.43	0.27	22.12	22.58	22.71	22.29
2003	19	4	19.01	0.07	19.03	18.95	18.97	19.11
2004	19	4	19.19	0.67	18.83	18.46	19.97	19.48
2005	19	4	20.21	0.38	20.63	19.88	20.45	19.90
2006	19	4	19.70	1.01	19.92	19.30	20.98	18.59
2001	20	4	34.16	0.73	34.23	34.28	34.95	33.19
2002	20	4	22.26	0.16	22.06	22.43	22.32	22.21
2003	20	4	18.77	0.46	18.31	18.47	18.99	19.31
2004	20	4	19.09	0.75	18.72	18.25	19.47	19.93
2005	20	4	19.71	0.15	19.88	19.56	19.60	19.79
2006	20	4	19.67	0.91	20.14	19.62	20.52	18.41
2001	22	4	33.46	0.37	33.96	33.15	33.21	33.55
2002	22	4	22.38	0.45	23.03	22.28	22.20	22.00
2003	22	4	18.67	0.14	18.49	18.62	18.79	18.76
2004	22	4	19.03	0.17	19.27	18.93	18.98	18.93
2005	22	4	19.23	0.13	19.22	19.41	19.20	19.09
2006	22	4	20.12	0.16	20.07	19.97	20.12	20.35
2001	23	4	35.49	0.55	35.67	36.17	35.01	35.08
2002	23	4	24.97	0.14	24.97	24.87	24.88	25.18
2003	23	4	21.57	0.99C	20.95	22.44	22.39	20.51
2004	23	4	21.54	0.39	21.21	21.40	21.43	22.11
2005	23	4	22.54	1.00 c	23.89	21.65	21.92	22.68
2006	23	4	22.75	0.56	22.54	22.25	23.55	22.67
2001	24	4	33.90	0.43	33.29	34.24	34.17	33.91
2002	24	4	23.12	0.33	23.31	22.75	23.46	22.94
2003	24	4	20.72	0.24	20.46	20.70	20.67	21.05
2004	24	4	20.23	0.22	20.53	20.09	20.24	20.05
2005	24	4	20.70	0.27	20.98	20.76	20.33	20.73
2006	24	4	21.79	0.26	21.91	22.09	21.53	21.61
2001	25	4	34.16	0.17	33.98	34.07	34.26	34.35
2002	25	4	22.62	0.17	22.85	22.48	22.50	22.64
2003	25	4	19.26	0.56	18.84	19.74	19.74	18.72
2004	25	4	19.74	0.40	19.83	20.11	19.84	19.17
2005	25	4	20.08	0.38	20.11	19.60	20.52	20.07
2006	25	4	20.17	0.42	20.58	20.20	19.59	20.32
2001	26	4	34.45	0.43	34.06	34.09	34.80	34.83

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	24.06	0.64	24.67	23.16	24.11	24.31
2003	26	4	21.71	1.41C	22.33	23.39	20.38	20.71
2004	26	4	22.25	0.30	22.43	22.54	21.87	22.13
2005	26	4	21.86	0.77	22.56	21.53	22.41	20.92
2006	26	4	22.29	0.66	23.17	22.43	21.86	21.71
2001	27	4	34.51	0.27	34.86	34.57	34.33	34.27
2002	27	4	23.49	0.21	23.32	23.64	23.71	23.30
2003	27	4	20.32	0.26	20.56	19.96	20.31	20.46
2004	27	4	20.07	0.19	19.87	19.97	20.12	20.31
2005	27	4	19.98	0.24	19.68	20.05	20.25	19.95
2006	27	4	21.56	0.33	21.55	21.98	21.17	21.53
2001	28	4	34.02	0.37	34.09	34.42	34.05	33.53
2002	28	4	22.97	0.15	22.86	22.86	23.18	22.97
2003	28	4	20.35	0.62	19.58	20.16	21.01	20.67
2004	28	4	20.03	0.08	19.96	19.97	20.13	20.04
2005	28	4	20.16	0.31	20.61	20.00	20.13	19.91
2006	28	4	20.83	0.19	21.04	20.89	20.82	20.59
2001	29	4	32.93	0.40	33.19	32.35	33.21	32.98
2002	29	4	21.99	0.45	21.82	22.12	21.48	22.55
2003	29	4	18.90	0.47	18.45	19.23	19.38	18.56
2004	29	4	18.20	0.45	18.24	17.66	18.12	18.76
2005	29	4	20.11	0.75	19.39	19.61	20.49	20.98
2006	29	3	22.45	1.41C	22.12	21.23	23.98	
2001	30	4	32.72	0.14	32.63	32.93	32.68	32.64
2002	30	4	21.51	0.19	21.29	21.42	21.63	21.70
2003	30	4	19.98	0.22	20.08	19.84	20.25	19.76
2004	30	4	15.90b	0.38	15.77	15.60	16.45	15.78
2005	30	4	18.08	0.22	18.28	17.78	18.19	18.05
2006	30	4	19.56	0.15	19.33	19.61	19.68	19.61
2001	31	4	34.04	1.87C	31.26	34.84	35.33	34.71
2002	31	4	23.76	1.25C	24.32	23.82	22.01	24.90
2003	31	4	20.83	0.09	20.70	20.91	20.83	20.86
2004	31	4	21.00	0.93	19.61	21.51	21.44	21.45
2005	31	4	20.81	0.73	21.18	19.72	21.10	21.23
2006	31	4	21.78	1.10	22.32	22.30	20.14	22.38
2001	32	4	33.31	0.76	32.87	33.03	34.45	32.91
2002	32	4	22.02	0.24	21.68	22.10	22.25	22.06
2003	32	4	19.19	0.14	19.34	19.25	19.15	19.01
2004	32	4	19.71	0.26	19.49	20.01	19.86	19.49
2005	32	4	19.60	0.28	20.00	19.46	19.37	19.57
2006	32	4	20.89	0.25	21.25	20.88	20.73	20.70
2001	33	4	33.15	0.33	32.72	33.49	33.28	33.10
2002	33	4	22.14	0.38	22.15	22.52	21.62	22.27
2003	33	4	19.58	0.76	19.49	20.50	19.67	18.65
2004	33	4	19.27	0.59	19.86	19.06	18.55	19.63
2005	33	4	19.66	0.69	19.46	19.33	20.67	19.16
2006	33	4	19.82	0.67	18.91	19.94	20.52	19.92
2001	34	4	35.16	0.52	34.95	35.51	35.65	34.53
2002	34	4	23.41	0.24	23.39	23.09	23.63	23.52
2003	34	4	20.33	0.38	20.52	20.73	19.84	20.24
2004	34	4	20.24	0.41	20.18	20.84	19.95	20.01
2005	34	4	20.63	0.28	20.72	20.23	20.67	20.89
2006	34	4	21.20	0.60	20.74	21.37	20.73	21.98

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	33.02	0.38	33.15	33.29	32.46	33.18		
2002	35	4	22.96	0.76	23.68	21.90	23.01	23.25		
2003	35	4	20.24	0.47	20.85	19.88	19.87	20.38		
2004	35	4	20.58	0.32	20.80	20.10	20.74	20.68		
2005	35	4	20.60	0.60	20.39	21.29	19.89	20.83		
2006	35	4	20.52	0.25	20.42	20.88	20.48	20.28		
2001	36	4	35.55	0.13	35.48	35.41	35.72	35.57		
2002	36	4	24.28	0.26	23.99	24.24	24.28	24.61		
2003	36	4	20.63	0.21	20.32	20.73	20.77	20.70		
2004	36	4	21.52	0.31	21.26	21.87	21.26	21.70		
2005	36	4	21.54	0.45	21.21	21.45	21.30	22.20		
2006	36	4	21.16	0.19	21.41	21.01	21.02	21.19		
2001	37	6	37.36	0.72	38.23	36.96	37.13	38.07	37.47	36.32
2002	37	6	23.75	0.49	23.45	23.96	23.08	23.51	24.38	24.15
2003	37	6	19.81	0.36	20.16	19.73	19.74	19.77	20.22	19.23
2004	37	6	19.55	0.31	19.52	20.02	19.49	19.07	19.68	19.49
2005	37	6	20.29	0.33	20.56	20.04	20.01	19.91	20.59	20.60
2006	37	6	20.66	0.44	20.34	20.41	20.70	20.48	20.51	21.51
2001	38	4	35.14	0.36	34.90	35.05	35.67	34.94		
2002	38	4	23.47	0.37	23.18	23.28	24.01	23.39		
2003	38	4	20.48	0.24	20.57	20.57	20.13	20.67		
2004	38	4	20.10	0.18	20.14	20.33	20.03	19.90		
2005	38	4	20.39	0.25	20.36	20.39	20.71	20.10		
2006	38	4	21.39	0.49	21.35	21.42	20.79	22.00		
2001	40	4	35.10	1.22C	33.66	36.39	35.76	34.59		
2002	40	4	23.35	0.65	23.30	22.95	22.86	24.29		
2003	40	4	20.38	0.62	19.81	20.58	21.15	19.96		
2004	40	4	20.77	0.88	19.69	21.81	20.59	21.01		
2005	40	4	20.37	0.84	19.54	21.46	19.94	20.56		
2006	40	4	21.18	0.96	19.83	22.00	21.19	21.70		
2001	113	4	35.37	0.09	35.26	35.33	35.42	35.46		
2002	113	4	20.91	0.14	21.04	21.02	20.82	20.75		
2003	113	5	19.60	0.64	19.79	19.87	19.89	20.01	18.47	
2004	113	5	18.35	0.08	18.22	18.34	18.40	18.40	18.38	
2005	113	5	19.41	0.06	19.32	19.40	19.41	19.48	19.45	
2006	113	5	19.98	0.09	20.06	19.87	19.92	19.98	20.06	
2001	137	6	37.25	0.74	38.28	36.84	37.11	37.81	37.28	36.17
2002	137	6	23.59	0.63	23.22	24.12	22.70	23.19	24.08	24.21
2003	137	6	19.71	0.40	20.10	19.70	19.61	19.70	20.12	19.04
2004	137	6	19.47	0.38	19.10	20.07	19.48	19.02	19.60	19.54
2005	137	6	20.17	0.31	20.39	19.98	19.80	19.92	20.48	20.48
2006	137	6	20.48	0.60	20.16	19.95	20.51	20.36	20.27	21.65

18.12 Elos / Cellulase

18.12.1 z-Werte / z Scores

Labor/Lab	2001	2002	2003	2004	2005	2006
1	0.28	0.88	0.56	0.90	0.91	0.32
3	2.23	0.77	1.13	0.92	1.00	0.48
5	-0.57	-0.14	-0.19	-0.96	0.12	-0.06
6	1.55	0.60	0.27	0.46	0.28	0.97
7	-0.03	-0.11	-0.56	-0.93	-0.42	-0.83
8	1.53	1.23	1.19	1.18	1.31	1.17
9	0.12	-0.02	-0.20	-0.07	0.02	-0.03
10	0.27	0.17	-0.38	-0.13	-0.15	-0.08
13	0.28	0.75	1.32	0.81	0.57	0.85
14	-0.04	-0.06	-0.21	-0.16	-0.35	-0.37
15	-0.08	-0.59	-0.77	-0.30	-0.11	0.84
17	-1.93	-2.75	-2.78	-2.65	-2.43	-1.97
18	-0.30	-0.25	-0.15	-0.50	-0.62	-0.09
19	-0.22	-0.03	-0.00	-0.19	-0.41	-0.16
20	-0.11	0.40	1.05	0.66	0.56	0.62
22	-0.70	-1.01	-1.21	-1.34	-1.41	-0.89
23	-0.15	-0.88	-0.58	-0.76	-0.93	-0.76
24	1.03	0.66	0.56	0.62	0.88	0.76
25	1.09	0.75	0.85	0.71	0.67	0.93
26	-0.24	-0.76	-1.15	-1.33	-0.84	-0.98
27	0.12	0.38	0.16	0.29	0.53	0.25
28	-0.74	-0.57	-1.23	-0.75	-0.82	-1.08
29	0.09	0.29	-0.16	0.38	-0.73	-1.95
30	0.29	-0.66	-1.40	0.92	0.17	-0.59
31	-1.32	-1.12	-1.45	-1.44	-1.44	-1.96
32	1.09	1.07	1.13	0.21	0.26	0.04
33	1.68	1.35	0.90	1.11	1.44	1.42
34	-0.86	-0.79	0.11	-0.26	-0.81	-0.02
35	0.41	-0.36	-0.41	-1.02	-0.57	-0.46
36	-0.36	-1.16	-0.33	-1.21	-0.94	-0.60
37	-1.85	-0.01	0.82	0.94	0.70	0.77
38	-1.23	-1.32	-0.50	-0.31	-0.27	-0.90
40	-0.18	0.66	0.93	0.52	0.97	1.33
113	0.31	2.32	1.58	2.55	1.94	2.00
137	-1.47	0.33	1.10	1.13	0.94	1.01

18.12.2 Einzelwerte / Single Values

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single values			
2001	1	4	53.94	0.20	53.79	54.18	53.76	54.04
2002	1	4	70.09	0.26	70.12	70.25	70.27	69.72
2003	1	4	73.10	0.12	73.23	73.14	73.09	72.94
2004	1	4	74.32	0.22	74.15	74.63	74.34	74.16
2005	1	4	74.17	1.09	73.24	75.43	73.28	74.75
2006	1	4	73.05	0.28	73.08	73.09	73.34	72.67
2001	3	4	57.35	0.51	57.27	57.63	57.83	56.67
2002	3	4	69.91	0.55	70.41	69.30	69.59	70.33
2003	3	4	74.10	0.39	74.67	73.96	73.89	73.87

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2004	3	4	74.35	0.50	74.19	75.06	74.26	73.89
2005	3	4	74.33	0.39	73.99	74.03	74.50	74.80
2006	3	4	73.34	0.43	73.15	73.63	72.82	73.73
2001	5	4	52.44	0.36	52.97	52.39	52.27	52.14
2002	5	4	68.32	0.42	68.28	68.76	67.78	68.47
2003	5	4	71.79	0.32	71.82	71.42	71.72	72.20
2004	5	4	71.05	0.36	70.94	71.00	70.70	71.56
2005	5	4	72.79	0.18	72.74	72.60	72.78	73.02
2006	5	4	72.38	0.39	72.46	71.80	72.63	72.62
2001	6	4	56.17	0.93	56.94	56.98	55.51	55.23
2002	6	4	69.60	0.61	70.43	69.41	68.99	69.57
2003	6	4	72.59	0.66	73.32	71.82	72.91	72.31
2004	6	4	73.54	0.95	73.90	72.14	74.20	73.92
2005	6	4	73.07	1.00	74.54	72.57	72.36	72.82
2006	6	4	74.18	0.78	73.89	73.23	74.98	74.64
2001	7	4	53.39	0.51	53.64	52.72	53.90	53.28
2002	7	4	68.37	0.85	68.07	68.98	67.32	69.13
2003	7	4	71.14	0.86	72.00	70.21	70.64	71.73
2004	7	4	71.10	1.15	69.80	70.54	71.73	72.35
2005	7	4	71.84	0.70	70.81	72.03	72.35	72.19
2006	7	4	71.03	0.49	71.02	70.36	71.32	71.44
2001	8	4	56.12	0.40	56.68	55.87	56.16	55.79
2002	8	4	70.70	0.49	70.05	70.65	70.90	71.22
2003	8	4	74.20	0.87	73.33	74.36	73.79	75.35
2004	8	4	74.80	0.31	75.23	74.52	74.80	74.64
2005	8	4	74.88	0.45	74.94	74.24	75.27	75.06
2006	8	4	74.53	1.11	73.55	76.12	74.17	74.30
2001	9	4	53.65	0.50	53.04	53.82	53.51	54.23
2002	9	4	68.52	0.41	68.31	68.88	68.06	68.84
2003	9	4	71.78	0.43	71.34	72.18	72.11	71.47
2004	9	4	72.62	0.29	72.42	72.45	73.05	72.55
2005	9	4	72.62	0.25	72.47	72.56	72.45	72.98
2006	9	4	72.44	0.45	72.94	71.85	72.51	72.48
2001	10	4	53.92	0.59	54.24	54.59	53.55	53.32
2002	10	4	68.85	0.24	68.72	69.20	68.85	68.65
2003	10	4	71.45	0.54	71.30	71.92	70.74	71.82
2004	10	4	72.50	0.13	72.68	72.39	72.47	72.48
2005	10	4	72.31	0.43	72.60	71.68	72.61	72.37
2006	10	4	72.35	0.25	72.09	72.20	72.47	72.65
2001	13	4	53.95	0.03	53.91	53.97	53.97	53.93
2002	13	4	69.87	0.17	70.09	69.86	69.86	69.67
2003	13	4	74.43	0.08	74.34	74.52	74.47	74.39
2004	13	4	74.14	0.09	74.14	74.12	74.05	74.27
2005	13	4	73.57	0.22	73.56	73.70	73.27	73.76
2006	13	4	73.98	0.11	73.93	73.95	74.14	73.91
2001	14	4	53.38	0.37	53.55	53.78	52.95	53.22
2002	14	4	68.45	0.72	67.92	69.42	67.90	68.57
2003	14	4	71.75	0.55	72.02	72.32	71.04	71.63
2004	14	4	72.45	0.41	73.01	72.25	72.06	72.49
2005	14	4	71.97	0.30	71.57	71.97	72.05	72.29
2006	14	4	71.83	0.30	71.83	71.84	71.46	72.20
2001	15	4	53.30	0.36	53.15	53.59	52.87	53.61
2002	15	4	67.53	0.48	67.10	67.19	67.67	68.15

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2003	15	4	70.77	0.91	70.57	72.02	69.84	70.66
2004	15	4	72.21	0.62	71.52	72.53	71.90	72.90
2005	15	4	72.39	0.40	72.73	71.91	72.71	72.21
2006	15	4	73.96	1.02	75.17	74.43	73.17	73.06
2001	17	4	50.07	0.72	49.94	49.22	50.98	50.16
2002	17	4	63.74	0.64	64.25	62.90	64.24	63.58
2003	17	4	67.25	0.12	67.27	67.41	67.16	67.15
2004	17	4	68.09	0.25	68.13	67.74	68.15	68.35
2005	17	4	68.33	0.39	67.77	68.35	68.54	68.66
2006	17	4	69.04	0.66	68.43	68.53	69.50	69.70
2001	18	4	52.92	0.59	52.66	52.88	52.39	53.75
2002	18	4	68.12	0.43	68.72	68.10	67.94	67.70
2003	18	4	71.85	0.43	72.08	71.54	72.35	71.45
2004	18	4	71.87	0.92	72.70	72.62	70.97	71.18
2005	18	4	71.50	0.63	70.61	71.93	71.51	71.95
2006	18	4	72.34	1.33	72.16	72.43	70.76	74.01
2001	19	4	53.06	0.60	52.88	53.12	52.39	53.83
2002	19	4	68.51	0.48	69.12	68.66	68.10	68.16
2003	19	4	72.11	0.10	72.11	72.26	72.03	72.05
2004	19	4	72.40	0.78	72.95	73.13	71.46	72.07
2005	19	4	71.87	0.47	71.22	72.25	71.84	72.17
2006	19	4	72.21	1.10	72.22	72.04	70.97	73.63
2001	20	4	53.26	0.83	53.10	53.02	52.49	54.44
2002	20	4	69.25	0.42	69.85	68.87	69.09	69.19
2003	20	4	73.96	0.53	74.23	74.16	74.28	73.17
2004	20	4	73.90	0.87	74.10	75.04	73.29	73.16
2005	20	4	73.56	0.33	73.29	73.71	73.97	73.30
2006	20	4	73.57	1.18	73.30	73.39	72.39	75.20
2001	22	4	52.22	1.22	51.45	52.59	53.77	51.08
2002	22	4	66.79	0.50	66.30	66.70	66.69	67.48
2003	22	4	69.99	0.63	70.60	69.67	69.28	70.44
2004	22	4	70.38	1.07	70.71	71.28	68.82	70.72
2005	22	4	70.12	0.38	70.30	69.56	70.20	70.41
2006	22	4	70.93	1.46	72.33	71.35	71.15	68.88
2001	23	4	53.18	0.66	52.85	52.42	53.77	53.68
2002	23	4	67.01	0.18	66.79	66.97	67.07	67.21
2003	23	4	71.11	1.22	71.84	70.58	69.66	72.36
2004	23	4	71.41	0.47	71.95	71.58	71.27	70.83
2005	23	4	70.96	0.76	70.16	71.51	71.71	70.45
2006	23	4	71.17	0.60	71.25	71.24	70.36	71.82
2001	24	4	55.26	0.42	55.89	54.98	55.09	55.08
2002	24	4	69.71	0.13	69.65	69.83	69.57	69.81
2003	24	4	73.11	0.10	73.08	73.25	73.05	73.05
2004	24	4	73.82	0.22	73.60	73.69	73.89	74.09
2005	24	4	74.12	0.23	74.06	73.94	74.05	74.46
2006	24	4	73.82	0.31	73.74	73.42	74.15	73.98
2001	25	4	55.35	0.35	55.65	55.59	55.28	54.88
2002	25	4	69.86	0.34	69.37	70.06	70.12	69.91
2003	25	4	73.60	0.66	73.96	73.17	72.93	74.35
2004	25	4	73.98	0.31	73.75	73.76	73.98	74.41
2005	25	4	73.76	0.62	73.50	74.65	73.21	73.68
2006	25	4	74.12	0.54	73.68	73.75	74.86	74.19
2001	26	4	53.03	0.27	53.38	53.10	52.73	52.94

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values			
2002	26	4	67.23	0.69	66.43	68.05	67.43	67.01
2003	26	4	70.10	1.61C	69.00	68.48	71.76	71.18
2004	26	4	70.41	0.22	70.08	70.53	70.46	70.55
2005	26	4	71.11	0.94	70.51	71.12	70.36	72.44
2006	26	4	70.77	1.01	69.55	70.52	71.94	71.08
2001	27	4	53.65	0.40	53.18	53.49	54.10	53.84
2002	27	4	69.22	0.16	69.05	69.25	69.14	69.43
2003	27	4	72.40	0.22	72.32	72.72	72.32	72.22
2004	27	4	73.24	0.45	73.89	72.92	73.20	72.95
2005	27	4	73.52	0.20	73.80	73.33	73.50	73.43
2006	27	4	72.93	0.37	72.52	72.73	73.29	73.19
2001	28	4	52.16	0.63	51.98	51.35	52.52	52.78
2002	28	4	67.57	0.33	67.82	67.54	67.11	67.80
2003	28	4	69.97	0.75	70.28	70.35	68.86	70.40
2004	28	4	71.42	0.24	71.77	71.37	71.35	71.20
2005	28	4	71.16	0.62	70.33	71.37	71.11	71.80
2006	28	4	70.61	0.09	70.73	70.58	70.50	70.61
2001	29	4	53.60	0.26	53.23	53.78	53.78	53.62
2002	29	4	69.07	0.64	69.67	69.51	68.26	68.86
2003	29	4	71.84	0.35	72.21	71.99	71.77	71.38
2004	29	4	73.41	0.48	73.46	73.92	73.47	72.77
2005	29	4	71.30	1.03	71.38	72.73	70.64	70.45
2006	29	3	69.08	0.64	69.73	69.05	68.46	
2001	30	4	53.95	0.22	54.22	53.95	53.69	53.95
2002	30	4	67.40	0.25	67.66	67.43	67.05	67.44
2003	30	4	69.67	0.22	69.66	69.47	69.56	69.99
2004	30	4	74.34	0.42	74.37	74.77	73.77	74.43
2005	30	4	72.89	0.40	72.39	73.36	72.83	72.98
2006	30	4	71.46	0.08	71.34	71.49	71.50	71.49
2001	31	4	51.13	0.81	49.98	51.51	51.18	51.85
2002	31	4	66.60	0.40	66.94	66.47	66.08	66.90
2003	31	4	69.57	0.29	69.62	69.16	69.83	69.69
2004	31	4	70.21	0.31	69.75	70.33	70.41	70.35
2005	31	4	70.07	0.45	70.49	69.72	69.64	70.42
2006	31	4	69.06	0.68	69.42	69.54	68.06	69.23
2001	32	4	55.36	0.32	55.79	55.40	55.17	55.08
2002	32	4	70.43	0.23	70.69	70.15	70.34	70.53
2003	32	4	74.10	0.93	75.12	74.04	74.38	72.88
2004	32	4	73.10	0.55	72.99	73.31	72.40	73.69
2005	32	4	73.03	0.71	72.83	72.50	74.08	72.73
2006	32	4	72.56	0.40	72.02	72.67	72.57	72.96
2001	33	4	56.39	0.72	56.89	55.33	56.82	56.51
2002	33	4	70.93	0.46	70.65	70.48	71.09	71.49
2003	33	4	73.69	0.47	73.67	73.32	73.40	74.35
2004	33	4	74.67	0.12	74.80	74.55	74.58	74.76
2005	33	4	75.10	0.73	75.78	75.57	74.18	74.87
2006	33	4	74.97	1.50	76.28	76.26	73.72	73.61
2001	34	4	51.95	0.99	52.17	51.53	50.88	53.22
2002	34	4	67.18	0.85	67.10	66.79	68.38	66.43
2003	34	4	72.30	0.46	71.96	71.89	72.53	72.84
2004	34	4	72.28	0.96	71.33	72.51	73.52	71.78
2005	34	4	71.16	1.24	71.69	71.59	72.04	69.32
2006	34	4	72.46	1.76	73.28	69.91	72.81	73.86

Probe/Sample	Labor/Lab	n	Mittel/Mean	Std/SD	Einzelwerte/Single Values					
2001	35	4	54.17	0.54	54.47	53.82	54.77	53.61		
2002	35	4	67.93	1.02	67.31	69.46	67.49	67.46		
2003	35	4	71.40	0.58	71.14	71.89	71.86	70.71		
2004	35	4	70.95	0.16	70.78	71.10	71.07	70.86		
2005	35	4	71.58	0.55	71.86	70.92	72.16	71.38		
2006	35	4	71.68	0.60	71.74	71.65	70.93	72.40		
2001	36	4	52.83	0.71	53.17	53.13	53.23	51.77		
2002	36	4	66.54	1.15	67.58	67.18	66.42	64.96		
2003	36	4	71.55	0.71	71.59	71.00	72.54	71.06		
2004	36	4	70.61	0.93	71.20	69.41	71.47	70.38		
2005	36	4	70.93	1.17	71.74	71.82	70.86	69.31		
2006	36	4	71.44	1.00	72.77	70.95	71.58	70.44		
2001	37	6	50.21	0.90	49.27	50.56	50.19	49.38	50.12	51.73
2002	37	6	68.55	0.48	68.33	68.33	69.26	69.01	68.06	68.28
2003	37	6	73.56	0.32	73.41	73.55	73.63	73.52	73.12	74.10
2004	37	6	74.38	0.44	74.77	73.74	74.69	74.81	74.03	74.24
2005	37	6	73.81	0.33	73.69	73.98	74.27	74.00	73.33	73.61
2006	37	6	73.84	0.73	74.91	73.97	73.85	73.95	73.76	72.62
2001	38	4	51.30	0.74	51.88	51.67	50.22	51.44		
2002	38	4	66.25	1.22	67.43	67.15	65.37	65.03		
2003	38	4	71.24	0.81	70.70	72.43	71.06	70.76		
2004	38	4	72.19	0.85	71.47	71.42	72.89	72.96		
2005	38	4	72.12	0.24	72.45	71.96	72.14	71.92		
2006	38	4	70.92	0.80	71.83	71.17	70.78	69.92		
2001	40	4	53.13	1.59 c	55.14	51.46	52.40	53.54		
2002	40	4	69.71	0.56	69.71	70.19	70.01	68.91		
2003	40	4	73.74	0.69	73.91	72.95	73.53	74.59		
2004	40	4	73.65	0.72	74.66	73.01	73.65	73.28		
2005	40	4	74.28	0.88	75.12	73.16	74.83	74.01		
2006	40	4	74.82	0.75	75.71	73.98	75.11	74.49		
2001	113	4	53.99	0.17	53.92	54.22	53.81	54.00		
2002	113	4	72.62	0.11	72.52	72.70	72.52	72.72		
2003	113	5	74.88	0.54	74.72	74.61	74.62	74.60	75.83	
2004	113	5	77.20	0.14	77.29	77.20	76.96	77.26	77.31	
2005	113	5	75.97	0.11	76.07	76.10	75.87	75.86	75.95	
2006	113	5	75.99	0.07	76.01	76.05	76.05	75.94	75.89	
2001	137	6	50.87	0.91	49.60	51.06	51.19	50.16	51.01	52.22
2002	137	6	69.14	0.67	69.44	68.59	70.09	69.53	68.30	68.88
2003	137	6	74.04	0.54	73.32	74.25	74.01	73.96	73.76	74.93
2004	137	6	74.72	0.47	75.11	73.94	74.75	75.27	74.55	74.69
2005	137	6	74.23	0.42	74.20	74.27	74.45	74.88	73.72	73.87
2006	137	6	74.26	0.66	75.08	74.57	74.19	74.17	74.45	73.08