



Final Report

evaluation of proficiency test

DLA ptSU10 (2025)

Free Amino Acids and Taurine in Food (Infant Food)

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<i>Vertraulichkeit</i> <i>Confidentiality</i>	Die Teilnehmerergebnisse sind im EP-Bericht in anonymisierter Form mit Auswertenummern benannt. Daten einzelner Teilnehmer werden ausschließlich nach vorheriger Zustimmung des Teilnehmers an Dritte weitergegeben. Participant results are named anonymously with evaluation numbers in the PT report. Data of individual participants will be passed on to third parties only with prior consent of the participant.

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The **List of Abbreviations** can be found in the
“DLA Evaluation Guide 02.02 (2024) General Proficiency Test Schemes”

1. Introduction

The participation in proficiency test (PT) schemes is an essential element of the quality management system of every laboratory testing food and feed, cosmetics and food contact materials. The implementation of proficiency tests enables the participating laboratories to prove their own analytical competence under realistic conditions. At the same time they receive valuable data regarding the verification and/or validation of the particular testing method [1, 5].

The purpose of DLA is to offer proficiency tests for selected parameters in concentrations with practical relevance.

Realisation and evaluation of the present proficiency test follows the technical requirements of DIN EN ISO/IEC 17043 (2010) and DIN ISO 13528:2022 [2, 3].

The general procedure for evaluating the DLA proficiency tests can be found in the **“DLA Evaluation Guide 02.02 (2024) General Proficiency Test Schemes”**.

2. Realisation

2.1 Test material

The test material is a common in commerce dietetic food "infant milk powder, for the dietetic treatment of severe food allergies from birth" based on free amino acids with a protein equivalent content < 20% from a European supplier.

The raw materials were sieved, mixed and homogenized.

Afterwards, the samples were portioned to approximately 10 g into metallized, recyclable PP foil bags and chronologically numbered.

The composition (list of ingredients) of the samples is given in table 1.

Table 1: Composition of DLA-Samples

Infant Milk Powder
<u>Ingredients:</u> Glucose syrup, vegetable oils , L-arginine, L-aspartate, L-leucine, L-lysine acetate, L-glutamine, L-proline, emulsifier (citric acid ester of mono- and diglycerides of fatty acids), L-valine, glycine, L-isoleucine, potassium orthophosphate, L-threonine, L-phenylalanine, L-tyrosine, L-serine, L-histidine, L-alanine, calcium orthophosphate, potassium citrate, sodium chloride, calcium carbonate, choline tartrate, L-cystine, calcium glycerophosphate, L-tryptophan, calcium citrate, magnesium chloride, oil from Crypthecodinium cohnii and Mortierella alpina, L-methionine, tri-calcium phosphate, magnesium-L-aspartate, inositol, vitamin C, antioxidants (lecithins, L-ascorbyl palmitate), taurine, iron-II-sulfate, zinc sulfate, L-carnitine, vitamin E, nucleotides (sodium salts of uridine-, cytidine-, inosine-, adenosine-, guanosine-5-monophosphate), niacin, pantothenic acid, copper sulfate, vitamin B1, vitamin B2, vitamin B6, vitamin A, potassium iodide, manganese II-sulfate, folic acid, vitamin K, sodium selenite, chromium chloride, sodium molybdate, biotin, vitamin D, vitamin B12 <u>Nutrients per 100 g:</u> Fat 26 g, carbohydrates 53 g thereof sugar 4,6 g, protein 13 g, salt 0,5 g

Note: The metrological traceability of temperature, mass and volume during production of the PT samples is ensured by DAkkS-compliant calibrated reference materials.

2.1.1 Homogeneity testing results

A specific description of the procedures can be found in the “**DLA Evaluation Guide 02.02 (2024) General Proficiency Test Schemes**”.

Homogeneity testing by microtracer

The microtracer analysis showed an acceptable homogeneity of the present PT samples (see Table 2). The results of microtracer analysis are given in the documentation (see 5.2.1).

Table 2: Results of microtracer analysis

Evaluation method	Criterion	PT Samples
Probability (poisson distribution)	≥ 5 % (good) ≥ 25% (excellent)	98 %
HorRat Value (normal distribution)	≤ 1,3	0,70

Homogeneity of the parameter(s)

The calculation of the **repeatability standard deviations S_r of the participants** was also used as an indicator of homogeneity. For all parameters the repeatability standard deviation was < 10% (see Table 3). Thus, they were similar to corresponding repeatability standard deviations of precision data of the standardized methods (e.g. ASU §64 L 49.07-1, s. 3.2) (see Table 6) [A].

The repeatability standard deviations of the participants' results are given in the documentation in the statistic data (see 4.1 to 4.23).

Table 3: Repeatability standard deviation S_r of double determinations of the participants (coefficient of variation CV_r in %)

Parameter	CV_r	Parameter	CV_r
L-Alanine	5,22 %	L-Leucine	2,40 %
L-Arginine	2,07 %	L-Lysine	3,30 %
L-Aspartic acid	2,85 %	L-Methionine	4,11 %
L-Cysteine	-	L-Phenylalanine	3,37 %
L-Cystine	5,02 %	L-Proline	2,92 %
Sum of L-Cysteine & L-Cystine	-	L-Serine	2,61 %
L-Cystine and Sum Results	6,08 %	L-Threonine	3,23 %
L-Glutamine	2,95 %	L-Tryptophan	1,30 %
L-Glutamic acid	-	L-Tyrosine	2,64 %
Glycine	6,94 %	L-Valine	1,96 %
L-Histidine	1,75 %		
L-Isoleucine	2,48 %	Taurine	2,83 %

In case the criterion for sufficient homogeneity of the test items is not fulfilled, the impact on the target standard deviation will be verified. If necessary, the evaluation of results will be done considering the standard uncertainty of the assigned value by z'-scores (s. DLA Evaluation Guide 2.02 (2024) 3.2.7.2 and 3.2.9) [3].

2.1.2 Stability

The a_w values of the PT **samples in form of powder** were below $< 0,6$ (see Table 4). Therefore, a good storage stability with respect to the durability of the sample (spoilage) and the content of the PT parameters as established for comparable food matrices can be expected. The stability of the sample material was thus ensured during the investigation period under the specified storage conditions.

Table 4: Results of water activity (a_w value).

Evaluation method	Criterion	PT Samples
a_w value	$\leq 0,6$	0,15 (RT)

2.2 Sample shipment and information to the test

The portions of test material were sent to every participating laboratory on 2025-08-20. The testing method was optional. The tests should be finished at 2025-10-03 the latest.

With the cover letter along with the sample shipment, the following information was given to the participants:

The two portions contain identical samples with the parameters of free amino acids and taurine in the matrix of an infant food powder for preparation of infant milk (balanced dietetic food). The protein equivalent content is $< 20\%$. The analysis method is optional.

Please note the attached information on the proficiency test.

(see documentation, section 5.4 Information on the PT)

2.3 Submission of results

The participants submitted their results online via an internet portal (my DLA | participant's portal at <https://my.dla-pt.com>) filled in standardized tables.

The finally calculated concentration of the parameter(s) as the average of duplicate determinations of both numbered samples was used for the statistical evaluation. For the calculation of the repeatability- and reproducibility standard deviation the single values of the double determination were used.

Queried and documented were single results, recovery and the used testing methods. In case participants submitted several results for the same parameter obtained by different methods, these results were evaluated with the same evaluation number with a letter as a suffix and indication of the related method.

14 out of 15 participants submitted at least one result.

3. Evaluation

A specific description of the concept and procedures can be found in the “**DLA Evaluation Guide 02.02 (2024) General Proficiency Test Schemes**”.

3.1 Quantitative Evaluation

From a total of 5 results on, a quantitative evaluation is carried out, provided that the conditions for a symmetrical distribution of the results and a joint evaluation are met. Frequently, different analytical methods may cause an anomaly in results' distribution. If this is the case, separate evaluations of the different methods with their own assigned values ($X_{pt\ METHOD\ i}$) are performed whenever possible.

In the present evaluation no such method-dependent differences were observed.

Table 5 gives an overview of the evaluation characteristics, their calculation and related criteria. The procedure is described in detail in the accompanying document: DLA Evaluation Guide 02.02 (2024).

Table 5: Evaluation characteristics and criterions for consensus values from participants

Evaluation characteristics	Calculation or criterion
Assigned value ($X_{pt\ ALL}$ or $X_{pt\ METHOD\ i}$)	Robust mean (algorithm A) or median
Standard deviation (S^*_{ALL} or $S^*_{METHOD\ i}$)	Standard deviation (algorithm A)
Target standard deviation (σ_{pt})	<i>General model according to:</i> Horwitz ($X_{pt} \geq 120\ \mu\text{g/kg}$) for the following parameters: L-Alanine, L-Aspartatic Acid, L-Leucine, L-Tryptophan, L-Valine and Taurine <i>From precision experiment according to:</i> ASU §64 L 49.07-1 (see 3.2) for all other parameters
Target standard deviation (for information)	<i>From precision experiment according to:</i> ASU §64 L 49.07-1 (see 3.2) for the following parameters: L-Alanine, L-Aspartatic Acid, L-Leucine, L-Tryptophan and L-Valine <i>General model according to:</i> Horwitz ($X_{pt} \geq 120\ \mu\text{g/kg}$) for all other parameters
Target standard deviation (σ_{pt}')	σ_{pt} extended by standard uncertainty for the following parameter(s): Glycine
Target range ($X_{pt} \pm 2\sigma_{pt}$ or $2\sigma_{pt}'$)	$X_{pt} \pm 2\sigma_{pt}$ or $2\sigma_{pt}'$
Quotient S^*/σ_{pt} or S^*/σ_{pt}'	$\leq 2,0$ (PT evaluation convincing)

z-Score or z'-Score	-2 ≤ z-score ≤ 2 (successful) -2 > z-score > 2 (warning signal) -3 > z-score > 3 (action signal)
Kernel density estimation Exclusion of outliers Repeatability standard deviation (S_r) Coefficient of Variation (CV_r) Reproducibility standard deviation (S_R) Coefficient of Variation (CV_R) Standard uncertainty of assigned value ($U_{(x_{pt})}$) Traceability	see DLA Evaluation Guide 02.02 (2024)

3.2 Additional information for the parameters

The following information is supplied in addition to the general information of the DLA Evaluation Guide 02.02 (2024).

Values by precision experiments

The relative repeatability standard deviations (RSD_r) and relative reproducibility standard deviations (RSD_R) given in table 6 were determined in ring tests using the indicated methods.

The resulting **target standard deviations σ_{pt}** , which were identified there, were used to evaluate the results and to provide additional information for the statistical data.

Table 6: Relative repeatability standard deviations (RSD_r) and relative reproducibility standard deviations (RSD_R) according to selected evaluations of tests for precision and the resulting target standard deviation σ_{pt} [A]

Parameter	Matrix	Mean	RSD_r	RSD_R	σ_{pt}	Method / Literature
L-Alanine	Dietetic food	3,09 g/100g	2,75%	4,37%	3,91% ¹	ASU 49.07-1
L-Arginine	Dietetic food	2,94 g/100g	3,41%	13,8%	13,6% ¹	ASU 49.07-1
L-Aspartic acid	Dietetic food	7,48 g/100g	2,41%	5,88%	5,62% ¹	ASU 49.07-1
L-Cysteine	Dietetic food	2,21 g/100g	7,71%	18,6%	17,8% ¹	ASU 49.07-1
L-Cystine	Dietetic food	2,21 g/100g	7,92%	18,4%	17,5% ¹	ASU 49.07-1
L-Glutamic acid	Dietetic food	16,6 g/100g	2,50%	6,93%	6,70% ¹	ASU 49.07-1
Glycine	Dietetic food	1,79 g/100g	3,07%	5,59%	5,15% ¹	ASU 49.07-1
L-Histidine	Dietetic food	1,92 g/100g	4,69%	16,4%	16,1% ¹	ASU 49.07-1
L-Isoleucine	Dietetic food	4,56 g/100g	2,63%	4,93%	4,57% ¹	ASU 49.07-1
L-Leucine	Dietetic food	7,35 g/100g	2,59%	4,69%	4,32% ¹	ASU 49.07-1
L-Lysine	Dietetic food	5,87 g/100g	2,81%	12,9%	12,7% ¹	ASU 49.07-1
L-Methionine	Dietetic food	1,88 g/100g	4,79%	7,45%	6,63% ¹	ASU 49.07-1
L-Phenylalanine	Dietetic food	3,19 g/100g	5,64%	7,21%	6,01% ¹	ASU 49.07-1
L-Proline	Dietetic food	7,09 g/100g	3,60%	6,56%	6,05% ¹	ASU 49.07-1
L-Serine	Dietetic food	4,00 g/100g	2,63%	7,63%	7,40% ¹	ASU 49.07-1
L-Threonine	Dietetic food	3,59 g/100g	3,34%	6,41%	5,96% ¹	ASU 49.07-1
L-Tryptophan	Dietetic food	1,32 g/100g	4,92%	20,1%	19,8% ¹	ASU 49.07-1
L-Tyrosine	Dietetic food	4,04 g/100g	5,07%	8,17%	7,34% ¹	ASU 49.07-1
L-Valine	Dietetic food	5,20 g/100g	2,60%	5,20%	4,86% ¹	ASU 49.07-1

¹ used for evaluation (cf. chapter 4)

The given values from ASU L 49.07-1 are mean values of samples I and II (exceptions: Methionine sample I, Phenylalanine sample II only)

Values by perception

Table 7 shows selected statistic data of participants' results of the present PT compared to PT results of previous years.

Table 7: Characteristics of the present PT (on grey) in comparison to the previous PT since 2013 (SD = standard deviation, CV = coefficient of variation)

Parameter	Matrix	rob. Mean	rob. SD (S*)	rel. SD (VK _{S*}) [%]	Quotient S*/opt	DLA Report
L-Alanine	Diet. food	0,609	0,0686	11,3	1,9 ¹	ptSU10 (2021)
L-Alanine	Diet. food	0,612	0,0442	7,23	1,7	ptSU10 (2023)
L-Alanine	Diet. food	0,613	0,0280	4,57	1,1	PtSU10 (2025)
L-Arginine	Diet. food	1,03	0,122	11,8	0,87	ptSU10 (2021)
L-Arginine	Diet. food	1,02	0,0921	9,02	0,66	ptSU10 (2023)
L-Arginine	Diet. food	1,05	0,054	5,15	0,38	PtSU10 (2025)
L-Aspartic acid	Diet. food	0,971	0,0915	9,42	1,7	ptSU10 (2021)
L-Aspartic acid	Diet. food	0,987	0,0644	6,52	1,2	ptSU10 (2023)
L-Aspartic acid	Diet. food	1,00	0,0463	4,62	1,2	PtSU10 (2025)
L-Cysteine	Diet. food	**	-	-	-	ptSU10 (2021)
L-Cysteine	Diet. food	**	-	-	-	ptSU10 (2023)
L-Cysteine	Diet. food	**	-	-	-	ptSU10 (2025)
L-Cystine	Diet. food	0,418	0,0520	12,4	0,71	ptSU10 (2021)
L-Cystine	Diet. food	0,399	0,0211	5,30	1,2	ptSU10 (2023)
L-Cystine	Diet. food	0,411	0,023	5,70	0,33	ptSU10 (2025)
L-Glutamine	Diet. food	1,34	0,117	8,72	1,7 ¹	ptSU10 (2021)
L-Glutamine	Diet. food	1,25	0,114	9,13	1,7 ¹	ptSU10 (2023)
L-Glutamine	Diet. food	1,29	0,063	4,87	0,73	ptSU10 (2025)
L-Glutamic acid	Diet. food	**	-	-	-	ptSU10 (2021)
L-Glutamic acid	Diet. food	**	-	-	-	ptSU10 (2023)
L-Glutamic acid	Diet. food	**	-	-	-	ptSU10 (2025)
Glycine	Diet. food	0,940	0,0785	8,35	1,6	ptSU10 (2021)
Glycine	Diet. food	0,929	0,1111	12,0	1,7 ¹	ptSU10 (2023)
Glycine	Diet. food	0,925	0,0828	8,95	1,5	ptSU10 (2025)
L-Histidine	Diet. food	0,590	0,0513	8,69	0,54	ptSU10 (2021)
L-Histidine	Diet. food	0,586	0,0795	13,6	0,85	ptSU10 (2023)
L-Histidine	Diet. food	0,581	0,022	3,80	0,24	ptSU10 (2025)
L-Isoleucine	Diet. food	0,925	0,0535	5,78	1,4	PtSU10 (2021)
L-Isoleucine	Diet. food	0,931	0,0762	8,18	2,0	ptSU10 (2023)

Parameter	Matrix	rob. Mean [g/100g]	rob. SD (S*) [g/100g]	rel. SD (VK _{S*}) [%]	Quotient S*/opt	DLA Report
L-Isoleucine	Diet. food	0,913	0,022	2,36	0,52	ptSU10 (2025)
L-Leucine	Diet. food	1,54	0,100	6,47	1,7	ptSU10 (2021)
L-Leucine	Diet. food	1,56	0,0660	4,25	1,1	ptSU10 (2023)
L-Leucine	Diet. food	1,53	0,062	4,07	1,1	ptSU10 (2025)
L-Lysine	Diet. food	1,08	0,168	15,5	1,2	ptSU10 (2021)
L-Lysine	Diet. food	1,03	0,0994	9,64	0,76	ptSU10 (2023)
L-Lysine	Diet. food	1,09	0,076	7,03	0,55	ptSU10 (2025)
L-Methionine	Diet. food	0,259	0,0224	8,65	1,3	ptSU10 (2021)
L-Methionine	Diet. food	0,256	0,0242	9,43	1,4	ptSU10 (2023)
L-Methionine	Diet. food	0,264	0,020	7,73	1,2	ptSU10 (2025)
L-Phenylalanine	Diet. food	0,744	0,102	13,7	1,8 ¹	ptSU10 (2021)
L-Phenylalanine	Diet. food	0,695	0,0934	13,4	1,7 ¹	ptSU10 (2023)
L-Phenylalanine	Diet. food	0,725	0,031	4,25	0,71	ptSU10 (2025)
L-Proline	Diet. food	1,14	0,0952	8,35	1,4	ptSU10 (2021)
L-Proline	Diet. food	1,12	0,0598	5,34	0,88	ptSU10 (2023)
L-Proline	Diet. food	1,11	0,032	2,89	0,48	ptSU10 (2025)
L-Serine	Diet. food	0,709	0,0410	5,78	0,78	ptSU10 (2021)
L-Serine	Diet. food	0,696	0,0205	2,95	0,70	ptSU10 (2023)
L-Serine	Diet. food	0,698	0,049	7,02	0,95	ptSU10 (2025)
L-Threonine	Diet. food	0,776	0,0814	10,5	1,8	ptSU10 (2021)
L-Threonine	Diet. food	0,785	0,0521	6,64	1,1	ptSU10 (2023)
L-Threonine	Diet. food	0,770	0,051	6,56	1,1	ptSU10 (2025)
L-Tryptophan	Diet. food	0,300	0,0311	10,4	0,52	ptSU10 (2021)
L-Tryptophan	Diet. food	0,294	0,0179	6,10	1,3	ptSU10 (2023)
L-Tryptophan	Diet. food	0,305	0,012	3,77	0,79	ptSU10 (2025)
L-Tyrosine	Diet. food	0,682	0,0321	4,71	0,64	ptSU10 (2021)
L-Tyrosine	Diet. food	0,696	0,0584	8,39	1,1	ptSU10 (2023)
L-Tyrosine	Diet. food	0,698	0,044	6,27	0,85	ptSU10 (2025)
L-Valine	Diet. food	1,01	0,100	9,98	1,6 ¹	ptSU10 (2021)
L-Valine	Diet. food	0,992	0,105	10,6	1,7 ¹	ptSU10 (2023)
L-Valine	Diet. food	1,04	0,046	4,41	1,1	ptSU10 (2025)
Taurine	Diet. food	0,0494	0,00439	8,89	1,4	ptSU10 (2021)
Taurine	Diet. food	0,0323	0,00401	12,4	1,5 ¹	ptSU10 (2023)
Taurine	Diet. food	0,032	0,002	6,11	0,91	ptSU10 (2025)

¹ with target standard deviation opt' / ** no statistical evaluation (< 7 results)

4. Results

Comments to the distribution of the results:

The kernel density plots showed for all parameters nearly a symmetrical distribution of results (figures see documentation 5.3). Partly, slight shoulders and separated smaller peaks can be seen, which are due to individual results and outliers. On the basis of the kernel density plots single results were excluded before statistic evaluation.

Comments to the statistic data:

There were < 5 results for L-Cysteine, Sum of L-Cysteine and L-Cystin and L-Glutamic acid, so that no statistical analysis could be carried out.

The target standard deviations were calculated for all parameters according to the model of Horwitz or according to the data of a precision experiment (ASU §64 method: L 47.07-01) (see Tab. 5). The evaluation according to Horwitz was preferably used as long as the quotients S^*/σ_{pt} were in the range of $\leq 2,0$ and the Horwitz target standard deviation did not result in an unreasonably small target range compared to the norm. In all other cases, the target standard deviation calculated from ASU §64 precision data was used. As far as available, the target standard deviation according to data of a precision experiment (ASU §64 method: L 47.07-01) or according to the model of Horwitz was given for information.

For Glycine the distribution of results showed an increased variability. The quotients S^*/σ_{pt} was well above 2,0. The parameter was therefore evaluated using the z'-score, taking into account the standard uncertainty. The quotient S^*/σ_{pt}' was then at 1,7 (see Tab. 7).

For the other parameters, the distribution of results showed a low or normal variability. The quotients S^*/σ_{pt} were all in the range from 0,33 to 1,5 (see Tab. 7).

The robust standard deviation and the repeatability and reproducibility standard deviations were in the expected range of usual values for the used determination methods (s. 3.2).

The comparability of the results is given.

75% to 100% of the results are within the respective target range.

Evaluation of results:

All following tables are anonymized. With the delivering of the evaluation report, the participants are informed about their individual evaluation number.

In the result chapter, all quantitative results of the participants are displayed formatted to 3 valid digits. In the documentation, all results are given as they were transmitted by the participants. The result tables are structured as below:

Evaluation number	Parameter [Unit]	Deviation	z-Score σ_{pt}	z-Score (Info)	Remark

4.1 L-Alanine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	12
Number of outliers	1
Mean	0,618
Median	0,607
Robust Mean (X_{pt})	0,613
Robust standard deviation (S^*)	0,0280
Number with 2 replicates	11
Repeatability SD (S_r)	0,0322
Repeatability (CV_r)	5,22%
Reproducibility SD (S_R)	0,0465
Reproducibility (CV_R)	7,52%
Target range:	
Target standard deviation σ_{pt}	0,0264
Target standard deviation (for Information)	0,0240
lower limit of target range	0,560
upper limit of target range	0,665
Quotient S^*/σ_{pt}	1,1
Standard uncertainty $U(X_{pt})$	0,0101
Results in the target range	9
Percent in the target range	75%

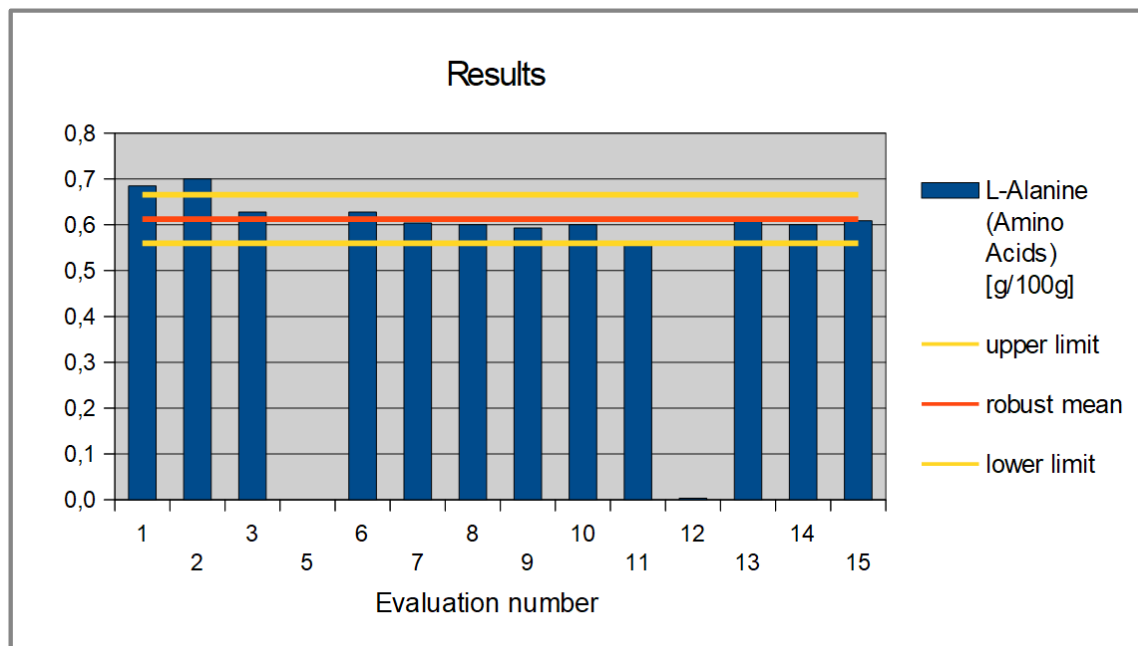
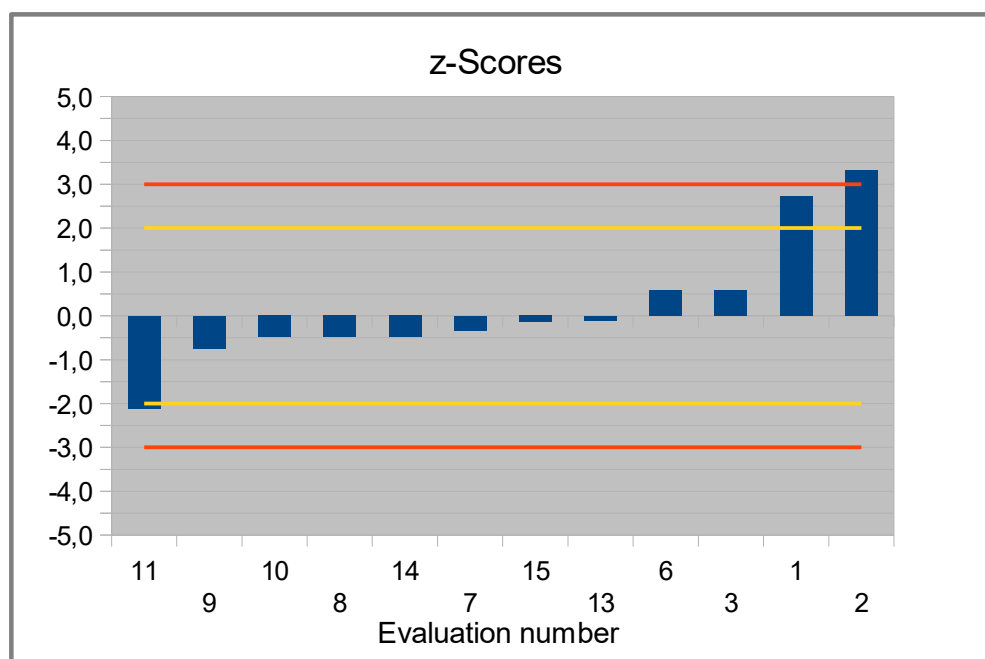


Fig. 1: Results L-Alanine

Results of Participants:

Evaluation number	L-Alanine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,685	0,072	2,7	3,0	
2	0,700	0,087	3,3	3,6	
3	0,628	0,015	0,58	0,64	
5					
6	0,628	0,015	0,58	0,64	
7	0,604	-0,009	-0,33	-0,36	
8	0,600	-0,013	-0,48	-0,53	
9	0,593	-0,020	-0,74	-0,82	
10	0,600	-0,013	-0,48	-0,53	
11	0,557	-0,056	-2,1	-2,3	
12	0,004				Outlier excluded
13	0,610	-0,003	-0,10	-0,11	
14	0,600	-0,013	-0,48	-0,53	
15	0,609	-0,004	-0,14	-0,15	

**Fig. 2:** z-Scores L-Alanine

4.2 L-Arginine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	-
Mean	1,05
Median	1,06
Robust Mean (X_{pt})	1,05
Robust standard deviation (S^*)	0,0541
Number with 2 replicates	12
Repeatability SD (S_r)	0,0216
Repeatability (CV_r)	2,07%
Reproducibility SD (S_R)	0,0587
Reproducibility (CV_R)	5,61%
Target range:	
Target standard deviation σ_{pt}	0,143
Target standard deviation (for Information)	0,0418
lower limit of target range	0,766
upper limit of target range	1,34
Quotient S^*/σ_{pt}	0,38
Standard uncertainty $U(X_{pt})$	0,0188
Results in the target range	13
Percent in the target range	100%

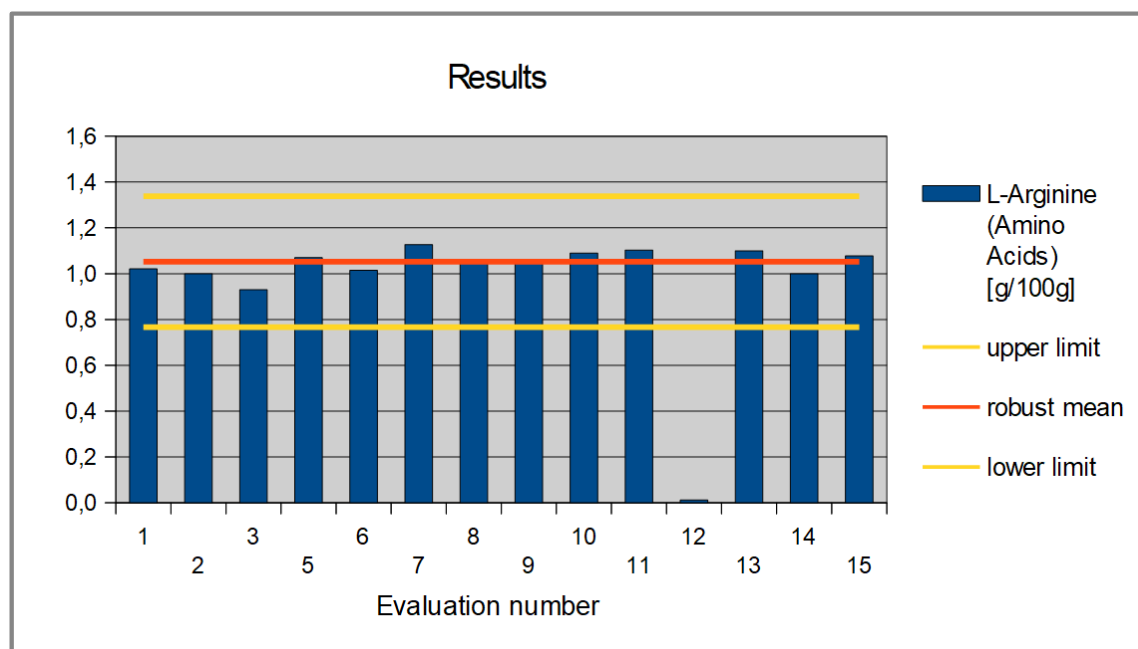
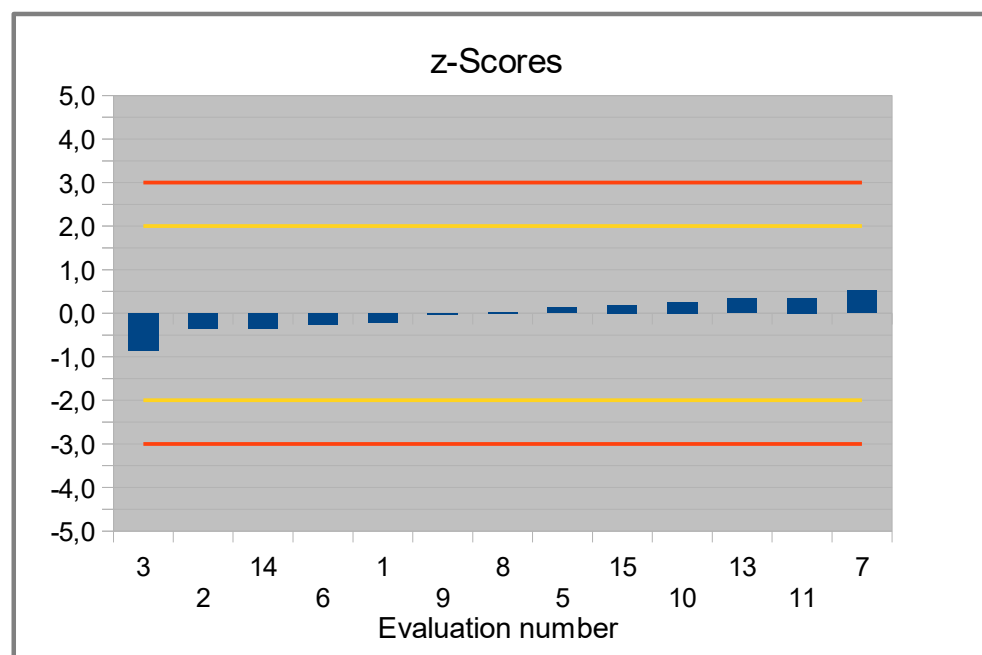


Fig. 3: Results L-Arginine

Results of Participants:

Evaluation number	L-Arginine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	1,02	-0,031	-0,22	-0,74	
2	1,00	-0,052	-0,36	-1,2	
3	0,930	-0,122	-0,85	-2,9	
5	1,07	0,018	0,13	0,43	
6	1,02	-0,037	-0,26	-0,89	
7	1,13	0,075	0,52	1,8	
8	1,06	0,004	0,03	0,09	
9	1,05	-0,006	-0,04	-0,15	
10	1,09	0,038	0,27	0,91	
11	1,10	0,051	0,36	1,2	
12	0,0119				Outlier excluded
13	1,10	0,048	0,34	1,1	
14	1,00	-0,052	-0,36	-1,2	
15	1,08	0,026	0,18	0,62	

**Fig. 4:** z-Scores L-Arginine

4.3 L-Aspartic Acid (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	-
Mean	1,00
Median	1,00
Robust Mean (X_{pt})	1,00
Robust standard deviation (S^*)	0,0463
Number with 2 replicates	12
Repeatability SD (S_r)	0,0287
Repeatability (CV_r)	2,85%
Reproducibility SD (S_R)	0,0478
Reproducibility (CV_R)	4,75%
Target range:	
Target standard deviation σ_{pt}	0,0401
Target standard deviation (for Information)	0,0564
lower limit of target range	0,922
upper limit of target range	1,08
Quotient S^*/σ_{pt}	1,2
Standard uncertainty $U(X_{pt})$	0,0161
Results in the target range	13
Percent in the target range	100%

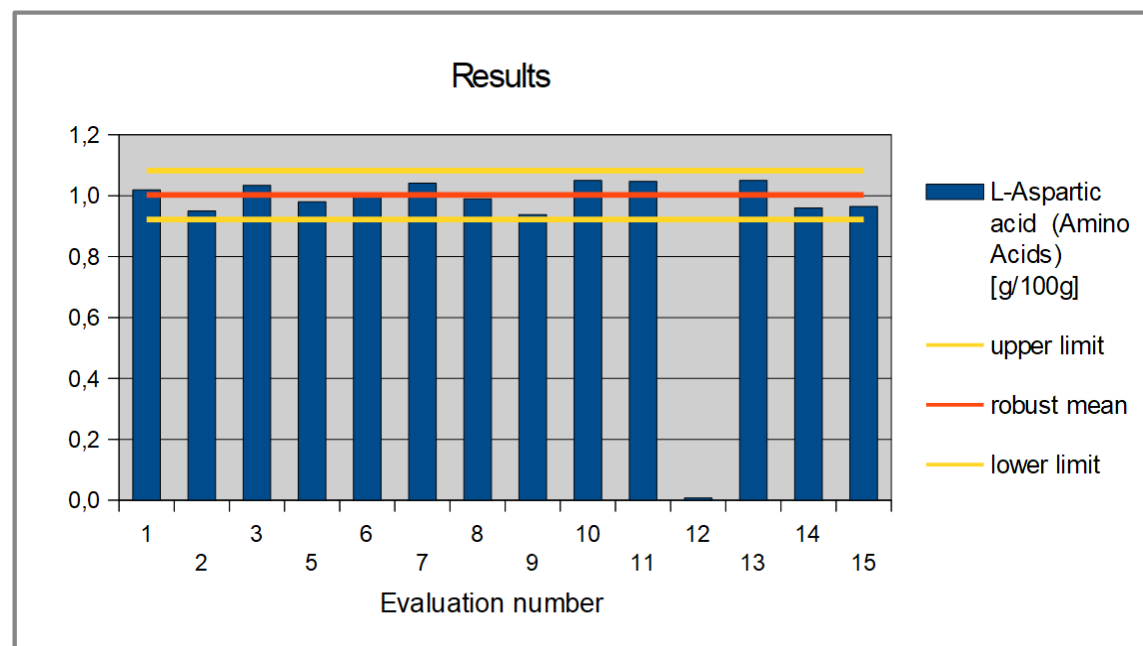


Fig. 5: Results L-Aspartic Acid

Results of Participants:

Evaluation number	L-Aspartic acid (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	1,02	0,017	0,42	0,30	
2	0,950	-0,052	-1,3	-0,92	
3	1,03	0,032	0,79	0,56	
5	0,980	-0,022	-0,55	-0,39	
6	1,00	0,002	0,05	0,03	
7	1,04	0,039	0,97	0,69	
8	0,990	-0,012	-0,30	-0,22	
9	0,938	-0,064	-1,6	-1,1	
10	1,05	0,048	1,2	0,85	
11	1,05	0,045	1,1	0,80	
12	0,00742				Outlier excluded
13	1,05	0,048	1,2	0,85	
14	0,960	-0,042	-1,1	-0,75	
15	0,965	-0,037	-0,93	-0,66	

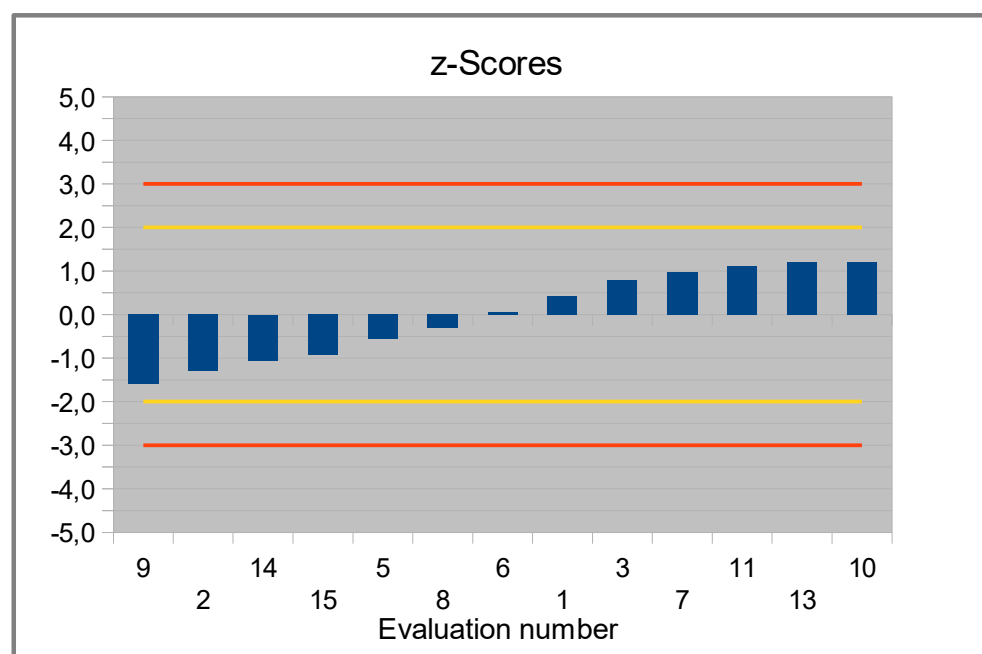


Fig. 6: z-Scores L-Aspartic Acid

4.4 L-Cysteine (in g/100g)

No results were submitted for L-Cysteine.

4.5 L-Cystine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	8
Number of outliers	-
Mean	0,414
Median	0,409
Robust Mean (X_{pt})	0,411
Robust standard deviation (S^*)	0,0234
Number with 2 replicates	7
Repeatability SD (S_r)	0,0209
Repeatability (CV_r)	5,02%
Reproducibility SD (S_R)	0,0317
Reproducibility (CV_R)	7,60%
Target range:	
Target standard deviation σ_{pt}	0,0721
Target standard deviation (for Information)	0,0188
lower limit of target range	0,267
upper limit of target range	0,555
Quotient S^*/σ_{pt}	0,33
Standard uncertainty $U(X_{pt})$	0,0104
Results in the target range	8
Percent in the target range	100%

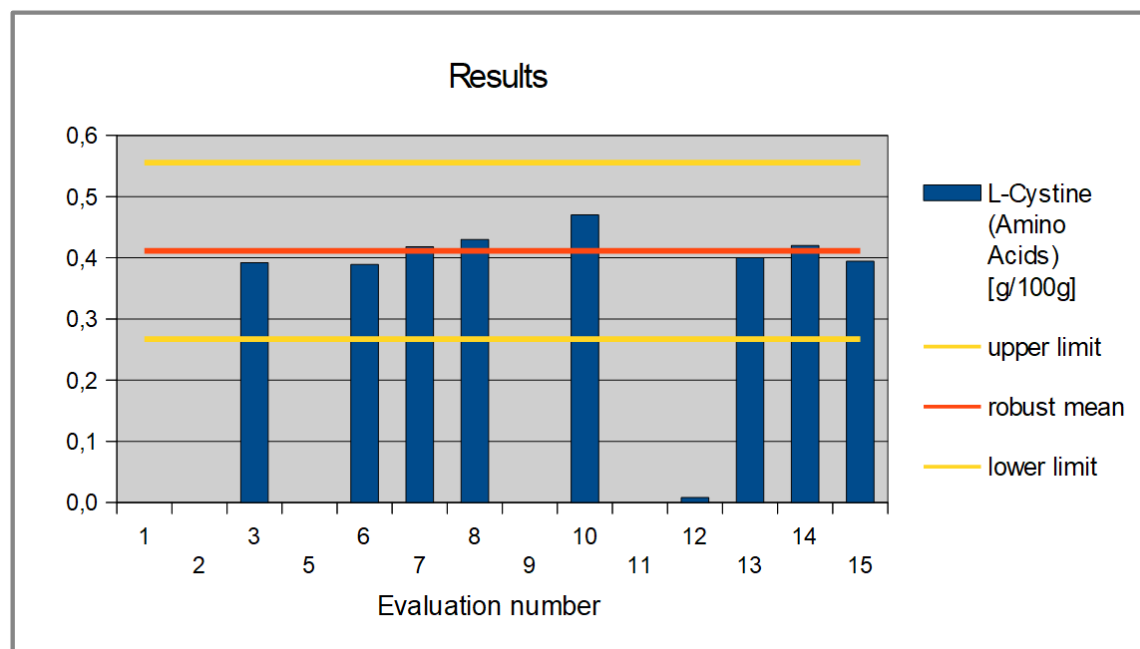
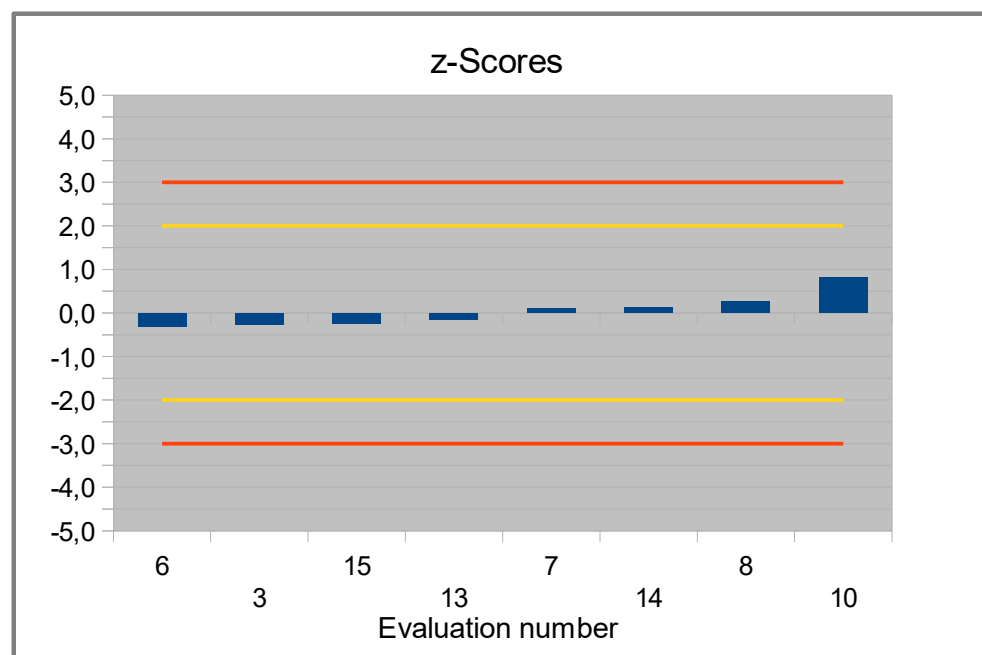


Fig. 7: Results L-Cystine

Results of Participants:

Evaluation number	L-Cystine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1					
2					
3	0,392	-0,019	-0,27	-1,0	
5					
6	0,389	-0,022	-0,31	-1,2	
7	0,418	0,007	0,09	0,36	
8	0,430	0,019	0,26	1,0	
9					
10	0,470	0,059	0,82	3,1	
11					
12	0,00798				Outlier excluded
13	0,400	-0,011	-0,16	-0,60	
14	0,420	0,009	0,12	0,47	
15	0,394	-0,017	-0,24	-0,90	

**Fig. 8:** z-Scores L-Cystine

4.6 Sum of L-Cysteine and L-Cystine (in g/100g)

Due to the low number of results no statistical evaluation was carried out.

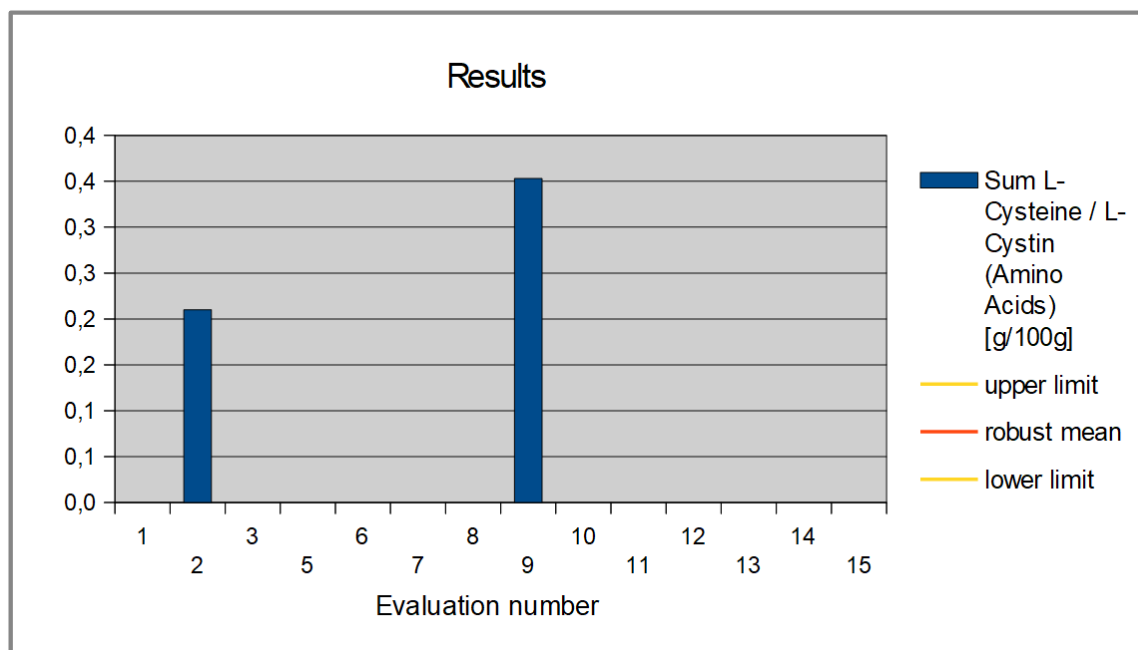


Fig. 9: Results Sum of L-Cysteine and L-Cystine

Evaluation number	Sum L-Cysteine / L-Cystin (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1					
2	0,210				
3					
5	<0,1				
6					
7					
8	-				
9	0,353				
10					
11					
12					Outlier excluded
13					
14					
15					

4.7 L-Cystine + Sum of L-Cysteine and L-Cystine (in g/100g)

Since the samples contained no L-cysteine the two results determined as sum of L-cysteine and L-cystin were evaluated together with the results for L-cystine for information.

Proficiency Test

Statistic Data	
Number of results	10
Number of outliers	1
Mean	0,388
Median	0,397
Robust Mean (X_{pt})	0,400
Robust standard deviation (S^*)	0,0403
Number with 2 replicates	9
Repeatability SD (S_r)	0,0235
Repeatability (CV_r)	6,08%
Reproducibility SD (S_R)	0,0770
Reproducibility (CV_R)	19,9%
Target range:	
Target standard deviation σ_{pt}	0,0700
Target standard deviation (for Information)	0,0183
lower limit of target range	0,259
upper limit of target range	0,540
Quotient S^*/σ_{pt}	0,57
Standard uncertainty $U(X_{pt})$	0,0159
Results in the target range	9
Percent in the target range	90%

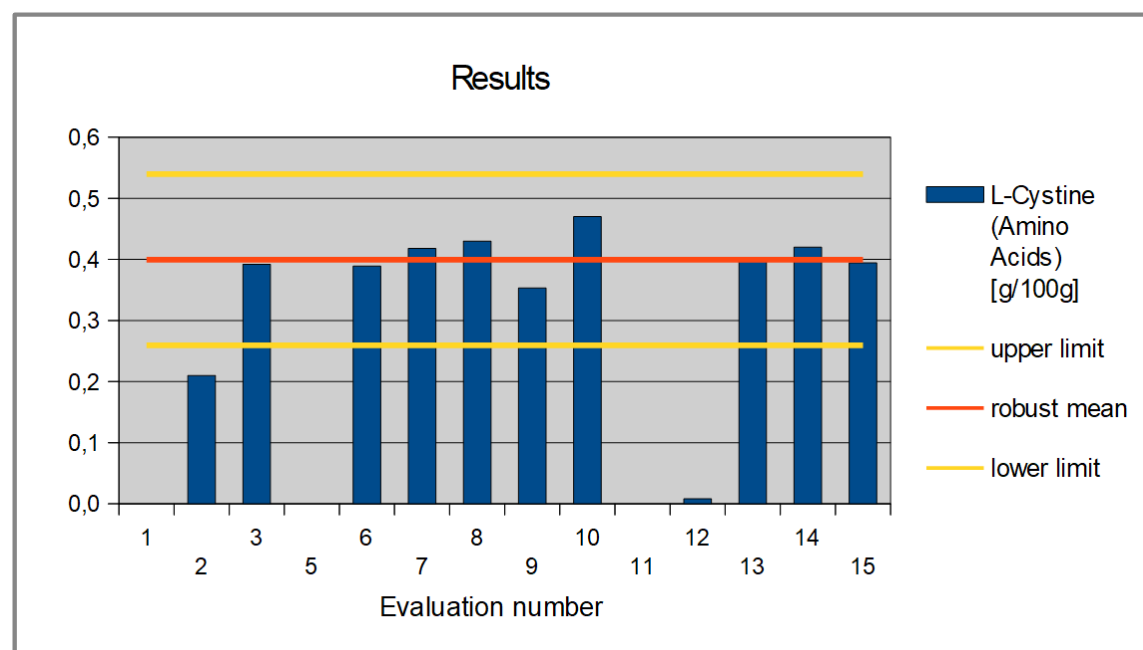


Fig. 10: Results L-Cystine + Sum of L-Cysteine and L-Cystine

Results of Participants:

Evaluation number	L-Cystine + Sum of L-Cysteine / L-Cystine [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1					
2	0,210	-0,190	-2,7	-10	
3	0,392	-0,008	-0,11	-0,41	
5					
6	0,389	-0,011	-0,15	-0,57	
7	0,418	0,018	0,26	1,0	
8	0,430	0,030	0,44	1,7	
9	0,353	-0,047	-0,66	-2,5	
10	0,470	0,070	1,0	3,8	
11					
12	0,00798				Outlier excluded
13	0,400	0,000	0,01	0,03	
14	0,420	0,020	0,29	1,1	
15	0,394	-0,005	-0,08	-0,29	

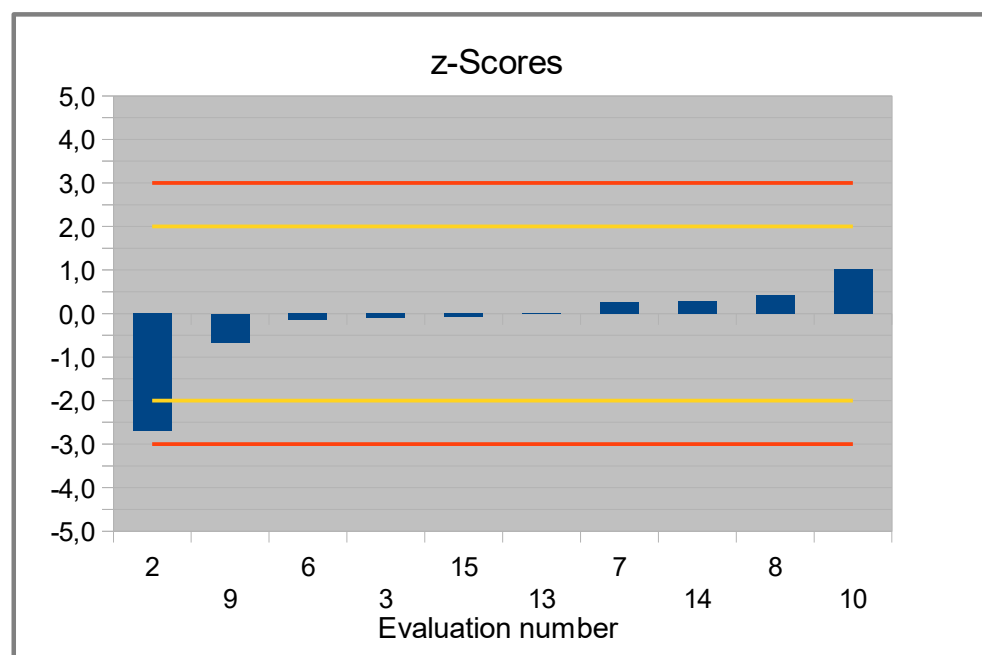


Fig. 11: z-Scores L-Cystine and Sum of L-Cysteine + L-Cystine

4.8 L-Glutamine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	7
Number of outliers	-
Mean	1,28
Median	1,31
Robust Mean (X_{pt})	1,29
Robust standard deviation (S^*)	0,0628
Number with 2 replicates	6
Repeatability SD (S_r)	0,0376
Repeatability (CV_r)	2,95%
Reproducibility SD (S_R)	0,0868
Reproducibility (CV_R)	6,81%
Target range:	
Target standard deviation σ_{pt}	0,0864
Target standard deviation (for Information)	0,0496
lower limit of target range	1,12
upper limit of target range	1,46
Quotient S^*/σ_{pt}	0,73
Standard uncertainty $U(X_{pt})$	0,0297
Results in the target range	7
Percent in the target range	100%

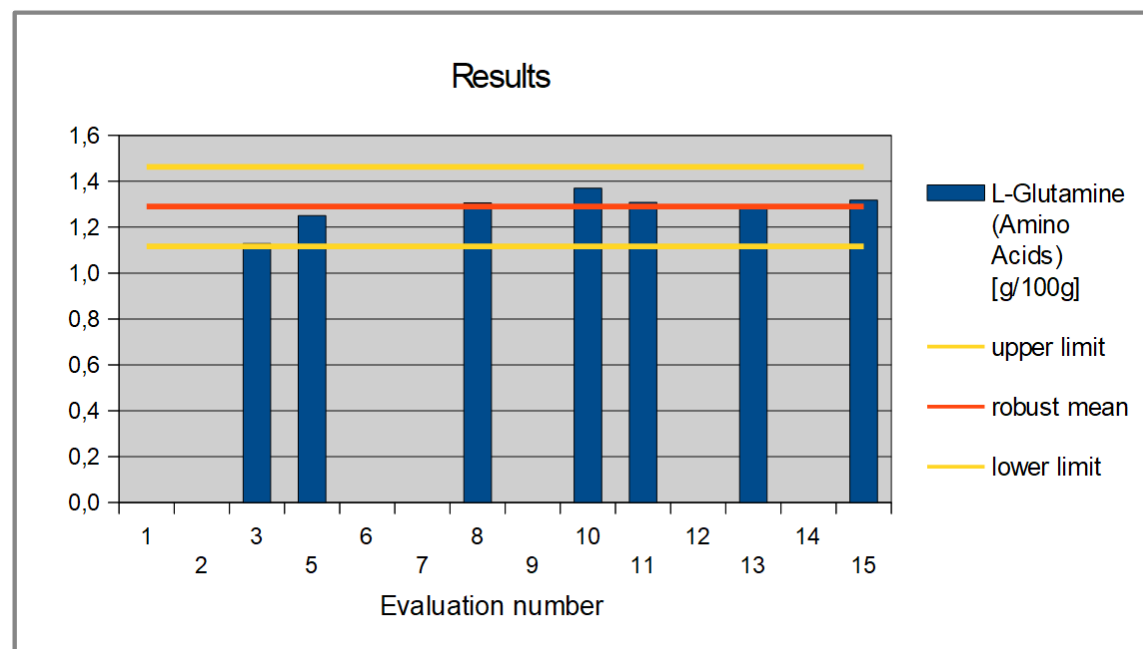
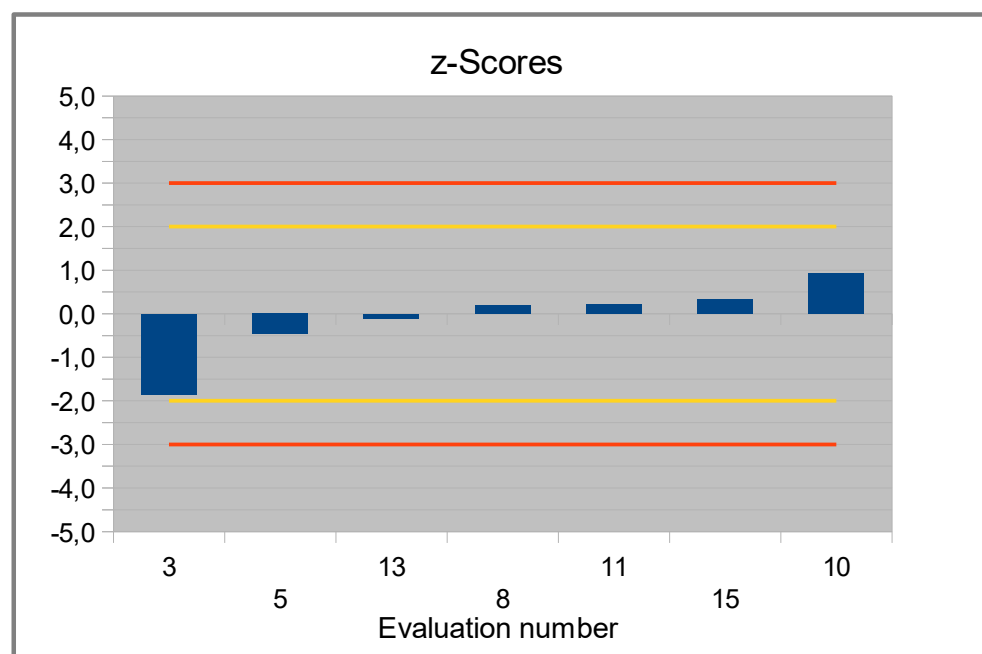


Fig. 12: Results L-Glutamine

Results of Participants:

Evaluation number	L-Glutamine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1					
2					
3	1,13	-0,161	-1,9	-3,2	
5	1,25	-0,040	-0,46	-0,80	
6					
7					
8	1,31	0,016	0,19	0,33	
9					
10	1,37	0,080	0,93	1,6	
11	1,31	0,018	0,21	0,37	
12					
13	1,28	-0,010	-0,11	-0,19	
14					
15	1,32	0,028	0,33	0,57	

**Fig. 13:** z-Scores L-Glutamine

4.9 L-Glutamic Acid (in g/100g)

Due to the low number of quantitative results no statistical evaluation was carried out.

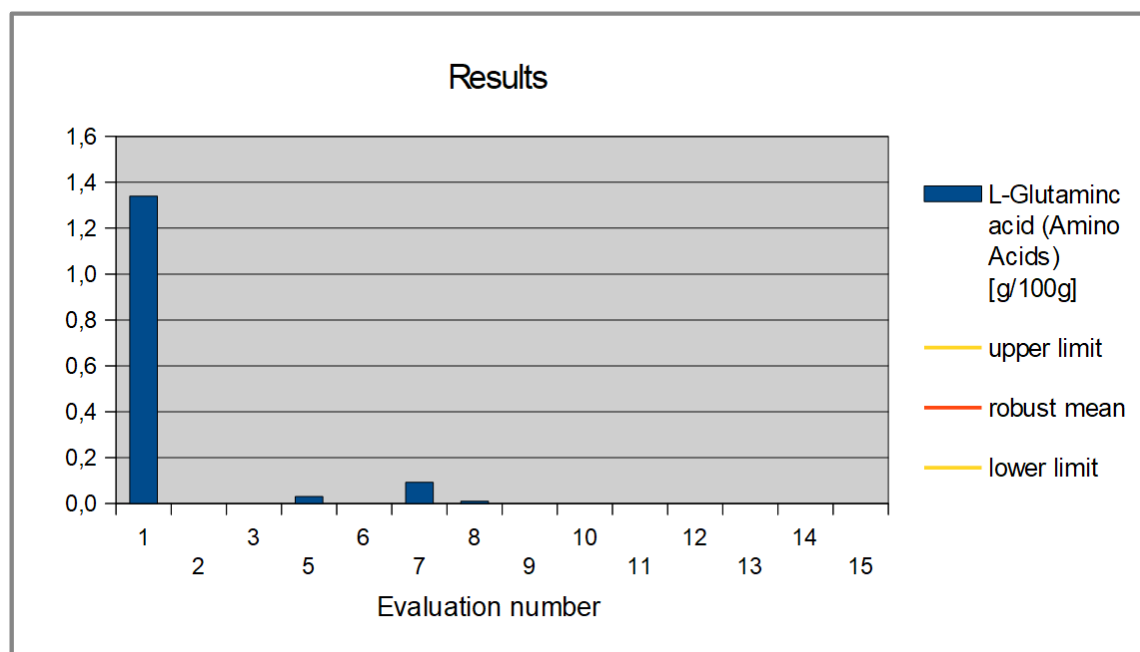


Fig. 14: Results L-Glutamic Acid

Results of Participants:

Evaluation number	L-Glutamic acid (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	1,34				
2	<0,02				
3					
5	0,030				
6					
7	0,092				
8	0,010				
9	<0,01				
10					
11	<0,07				
12	<0.00792				
13	<0,01				
14	0				

4.10 Glycine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	12
Number of outliers	-
Mean	0,920
Median	0,935
Robust Mean (X_{pt})	0,925
Robust standard deviation (S^*)	0,0828
Number with 2 replicates	11
Repeatability SD (S_r)	0,0641
Repeatability (CV_r)	6,94%
Reproducibility SD (S_R)	0,0891
Reproducibility (CV_R)	9,65%
Target range:	
Target standard deviation σ_{pt}	0,0562
Target standard deviation (for Information)	0,0374
lower limit of target range	0,812
upper limit of target range	1,04
Quotient S^*/σ_{pt}	1,5
Standard uncertainty $U(X_{pt})$	0,0299
Results in the target range	11
Percent in the target range	92%

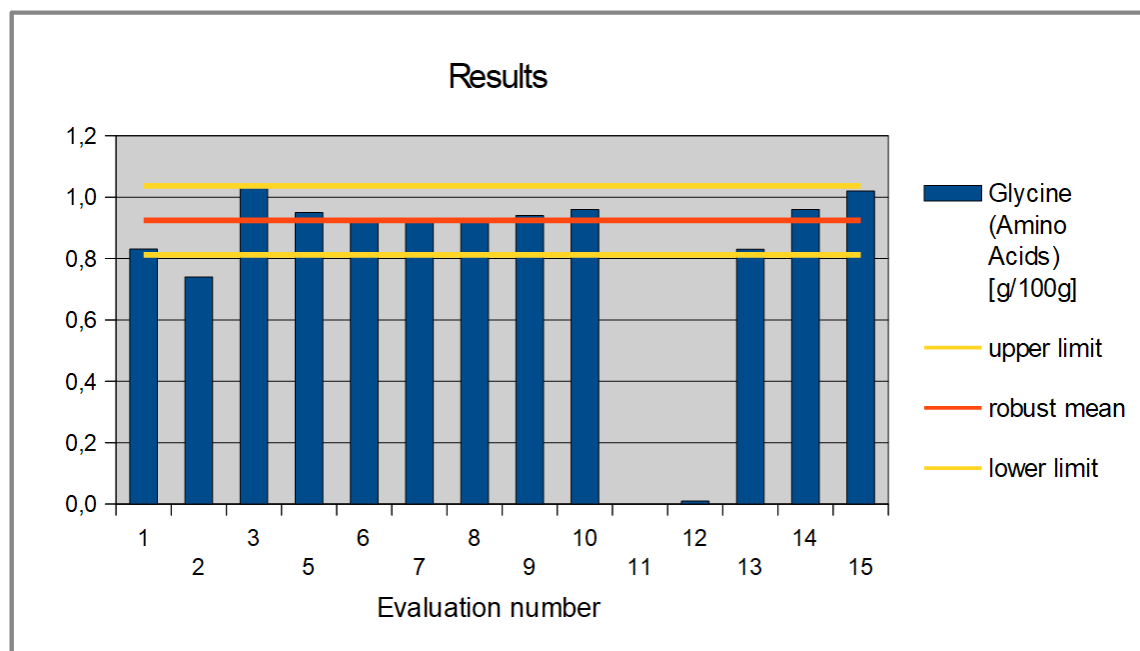
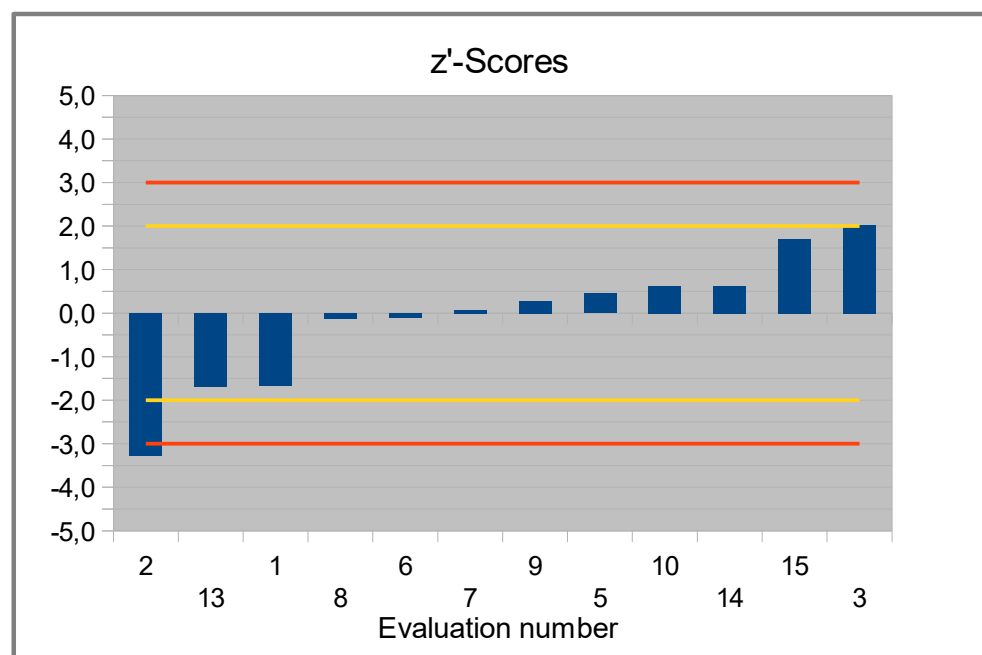


Fig. 15: Results Glycine

Results of Participants:

Evaluation number	Glycine (Amino Acids) [g/100g]	Deviation [g/100g]	z'-Score (opt)	z-Score (Info)	Remarks
1	0,831	-0,094	-1,7	-2,5	
2	0,740	-0,185	-3,3	-4,9	
3	1,04	0,113	2,0	3,0	
5	0,950	0,025	0,45	0,68	
6	0,919	-0,006	-0,10	-0,15	
7	0,929	0,004	0,08	0,12	
8	0,917	-0,008	-0,13	-0,20	
9	0,940	0,015	0,28	0,41	
10	0,960	0,035	0,63	0,95	
11					
12	0,00978				Outlier excluded
13	0,830	-0,095	-1,7	-2,5	
14	0,960	0,035	0,63	0,95	
15	1,02	0,095	1,7	2,6	

**Fig. 16:** z'-Scores Glycine

4.11 L-Histidine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	11
Number of outliers	2
Mean	0,575
Median	0,580
Robust Mean (X_{pt})	0,581
Robust standard deviation (S^*)	0,0221
Number with 2 replicates	12
Repeatability SD (S_r)	0,0127
Repeatability (CV_r)	1,75%
Reproducibility SD (S_R)	0,353
Reproducibility (CV_R)	48,9%
Target range:	
Target standard deviation σ_{pt}	0,0933
Target standard deviation (for Information)	0,0252
lower limit of target range	0,394
upper limit of target range	0,768
Quotient S^*/σ_{pt}	0,24
Standard uncertainty $U(X_{pt})$	0,00833
Results in the target range	11
Percent in the target range	100%

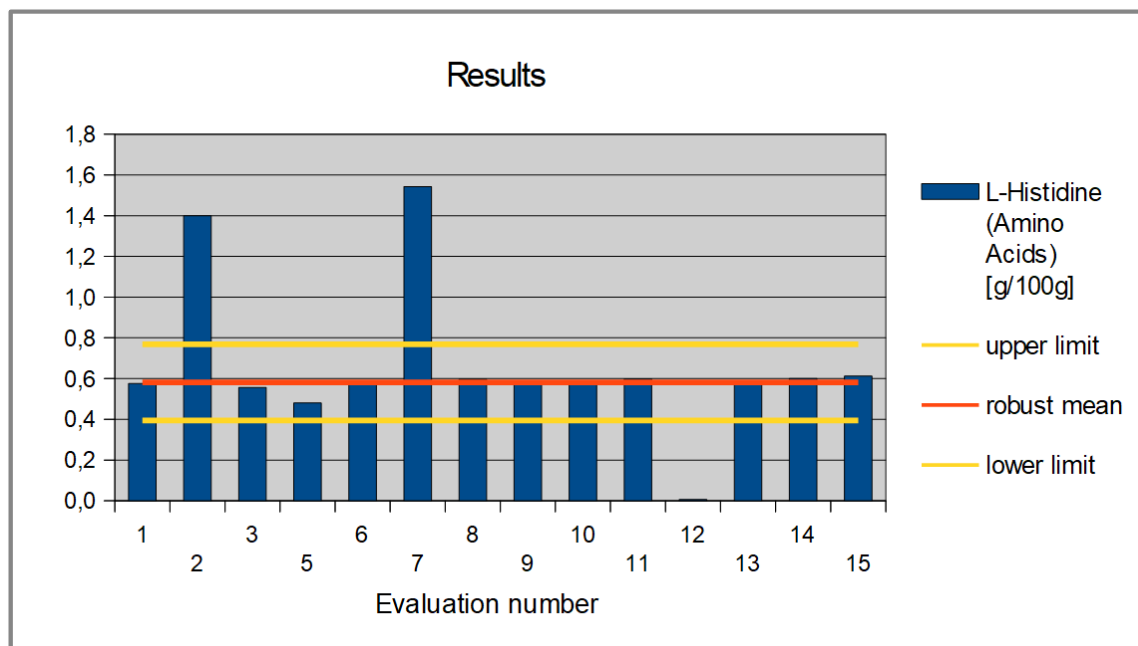
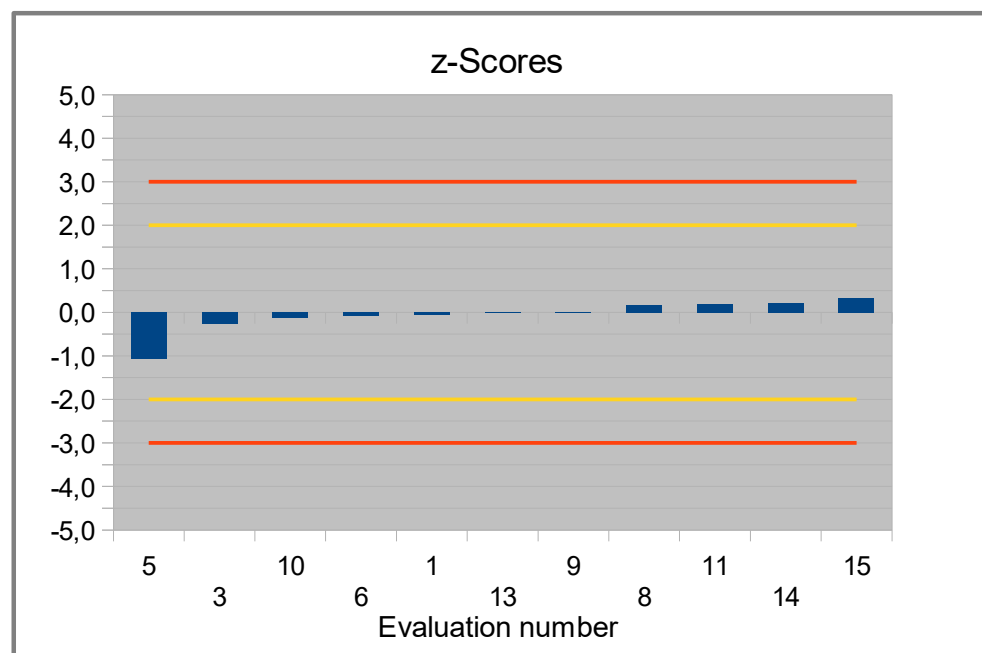


Fig. 17: Results L-Histidine

Results of Participants:

Evaluation number	L-Histidine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,576	-0,01	-0,05	-0,20	
2	1,40				Outlier excluded
3	0,556	-0,03	-0,27	-1,0	
5	0,480	-0,10	-1,1	-4,0	
6	0,573	-0,01	-0,09	-0,32	
7	1,54				Outlier excluded
8	0,597	0,02	0,17	0,63	
9	0,582	0,00	0,01	0,04	
10	0,570	-0,01	-0,12	-0,44	
11	0,598	0,02	0,18	0,67	
12	0,00633				Outlier excluded
13	0,580	0,00	-0,01	-0,04	
14	0,600	0,02	0,20	0,75	
15	0,612	0,03	0,33	1,2	

**Fig. 18:** z-Scores L-Histidine

4.12 L-Isoleucine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	0,917
Median	0,911
Robust Mean (X_{pt})	0,913
Robust standard deviation (S^*)	0,0215
Number with 2 replicates	12
Repeatability SD (S_r)	0,0227
Repeatability (CV_r)	2,48%
Reproducibility SD (S_R)	0,0320
Reproducibility (CV_R)	3,49%
Target range:	
Target standard deviation σ_{pt}	0,0417
Target standard deviation (for Information)	0,0370
lower limit of target range	0,830
upper limit of target range	0,997
Quotient S^*/σ_{pt}	0,52
Standard uncertainty $U(X_{pt})$	0,00746
Results in the target range	13
Percent in the target range	100%

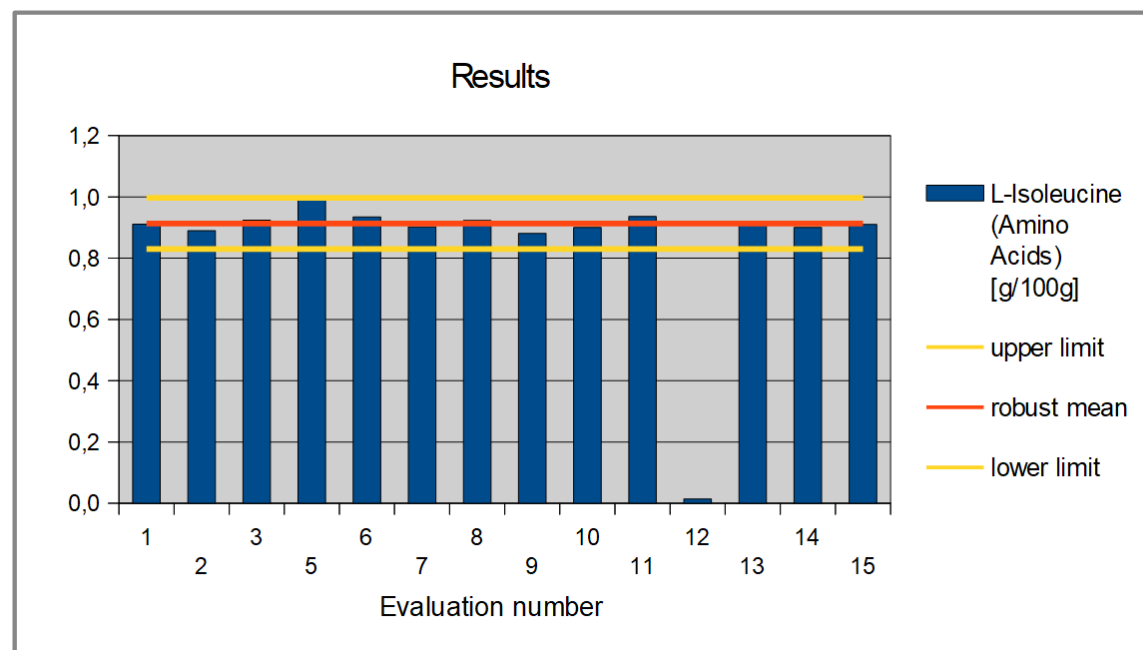


Fig. 19: Results L-Isoleucine

Results of Participants:

Evaluation number	L-Isoleucine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,911	0,00	-0,05	-0,06	
2	0,890	-0,02	-0,56	-0,63	
3	0,924	0,01	0,26	0,29	
5	0,990	0,08	1,8	2,1	
6	0,935	0,02	0,52	0,59	
7	0,902	-0,01	-0,27	-0,30	
8	0,923	0,01	0,23	0,26	
9	0,881	-0,03	-0,77	-0,87	
10	0,900	-0,01	-0,32	-0,36	
11	0,936	0,02	0,55	0,61	
12	0,0144				Outlier excluded
13	0,915	0,00	0,04	0,05	
14	0,900	-0,01	-0,32	-0,36	
15	0,910	0,00	-0,08	-0,09	

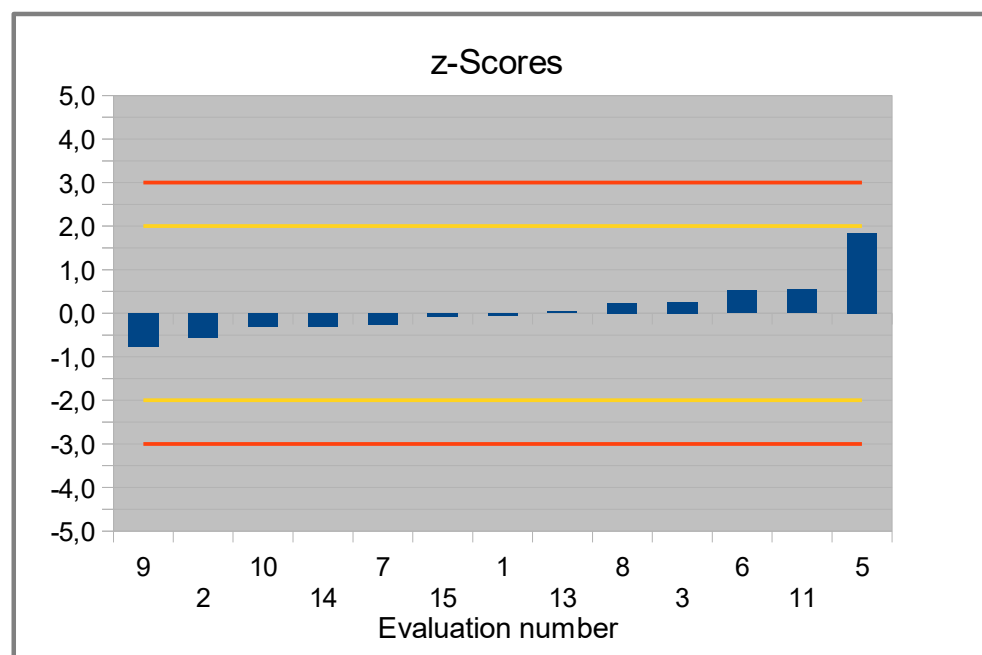


Fig. 20: z-Scores L-Isoleucine

4.13 L-Leucine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	1,53
Median	1,52
Robust Mean (X_{pt})	1,53
Robust standard deviation (S^*)	0,0625
Number with 2 replicates	12
Repeatability SD (S_r)	0,0371
Repeatability (CV_r)	2,40%
Reproducibility SD (S_R)	0,0624
Reproducibility (CV_R)	4,04%
Target range:	
Target standard deviation σ_{pt}	0,0576
Target standard deviation (for Information)	0,0663
lower limit of target range	1,42
upper limit of target range	1,65
Quotient S^*/σ_{pt}	1,1
Standard uncertainty $U(X_{pt})$	0,0217
Results in the target range	13
Percent in the target range	100%

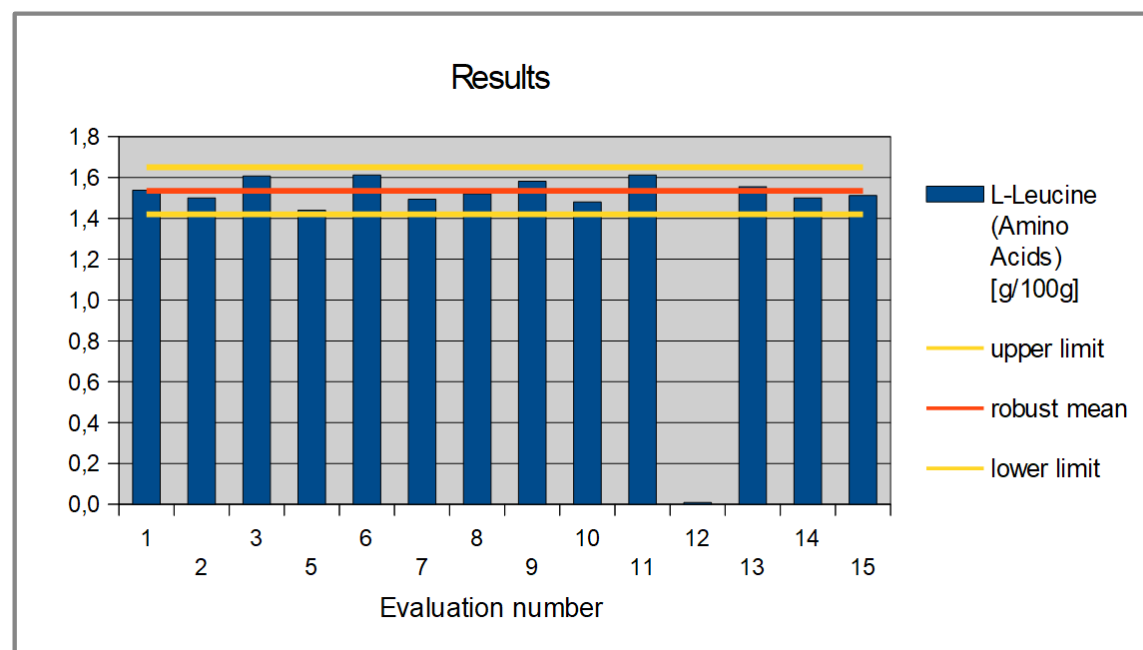


Fig. 21: Results L-Leucine

Results of Participants:

Evaluation number	L-Leucine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	1,54	0,00	0,05	0,05	
2	1,50	-0,03	-0,61	-0,53	
3	1,61	0,07	1,3	1,1	
5	1,44	-0,09	-1,6	-1,4	
6	1,61	0,08	1,3	1,2	
7	1,49	-0,04	-0,73	-0,63	
8	1,52	-0,01	-0,24	-0,21	
9	1,58	0,05	0,82	0,71	
10	1,48	-0,05	-0,95	-0,83	
11	1,61	0,08	1,3	1,2	
12	0,00841				Outlier excluded
13	1,56	0,02	0,35	0,30	
14	1,50	-0,03	-0,61	-0,53	
15	1,51	-0,02	-0,40	-0,34	

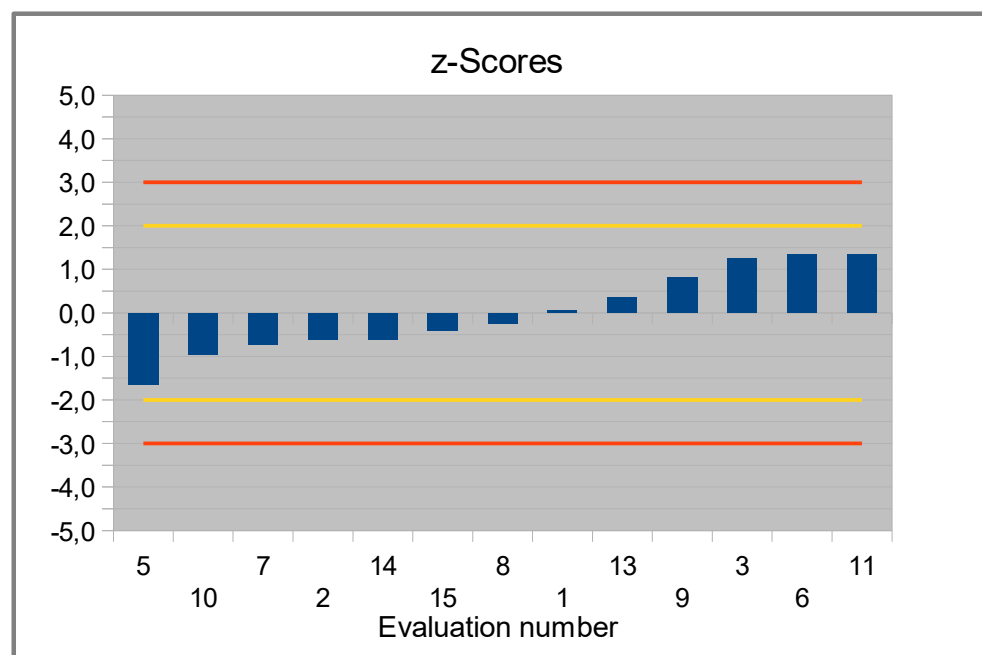


Fig. 22: z-Scores L-Leucine

4.14 L-Lysine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	1,09
Median	1,08
Robust Mean (X_{pt})	1,09
Robust standard deviation (S^*)	0,0765
Number with 2 replicates	11
Repeatability SD (S_r)	0,0358
Repeatability (CV_r)	3,30%
Reproducibility SD (S_R)	0,0886
Reproducibility (CV_R)	8,15%
Target range:	
Target standard deviation σ_{pt}	0,139
Target standard deviation (for Information)	0,0430
lower limit of target range	0,811
upper limit of target range	1,37
Quotient S^*/σ_{pt}	0,55
Standard uncertainty $U(X_{pt})$	0,0265
Results in the target range	13
Percent in the target range	100%

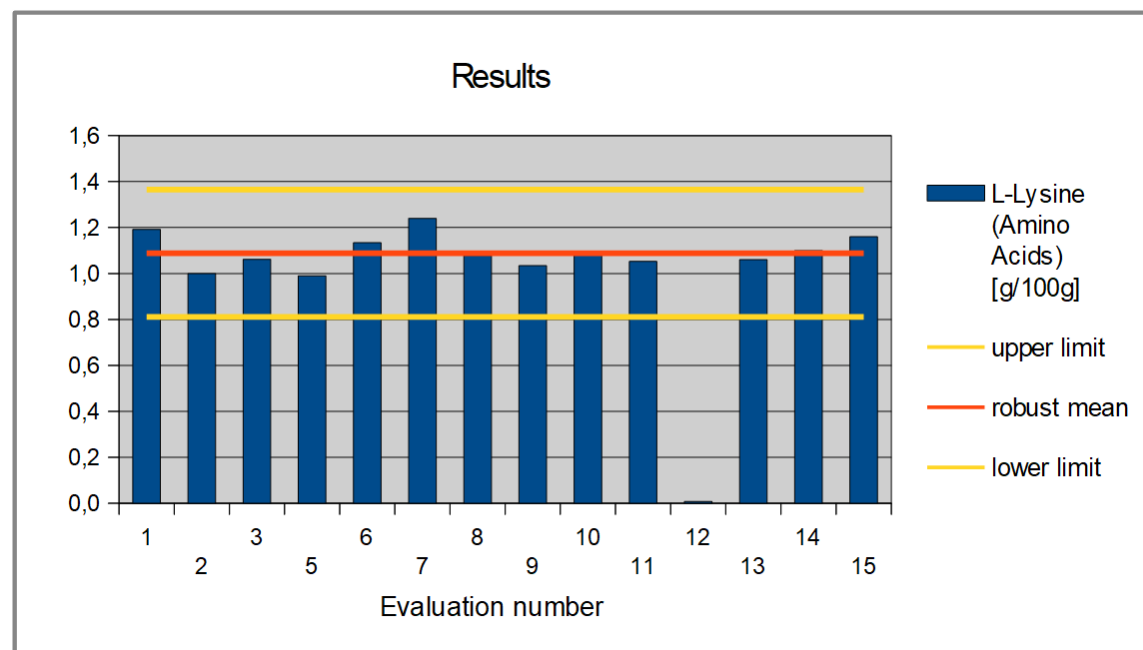


Fig. 23: Results L-Lysine

Results of Participants:

Evaluation number	L-Lysine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	1,19	0,104	0,75	2,4	
2	1,00	-0,088	-0,64	-2,1	
3	1,06	-0,026	-0,19	-0,61	
5	0,990	-0,098	-0,71	-2,3	
6	1,13	0,046	0,33	1,1	
7	1,24	0,152	1,1	3,5	
8	1,08	-0,009	-0,07	-0,21	
9	1,03	-0,054	-0,39	-1,3	
10	1,08	-0,008	-0,06	-0,19	
11	1,05	-0,036	-0,26	-0,83	
12	0,00823				Outlier excluded
13	1,06	-0,028	-0,20	-0,66	
14	1,10	0,012	0,09	0,27	
15	1,16	0,072	0,52	1,7	

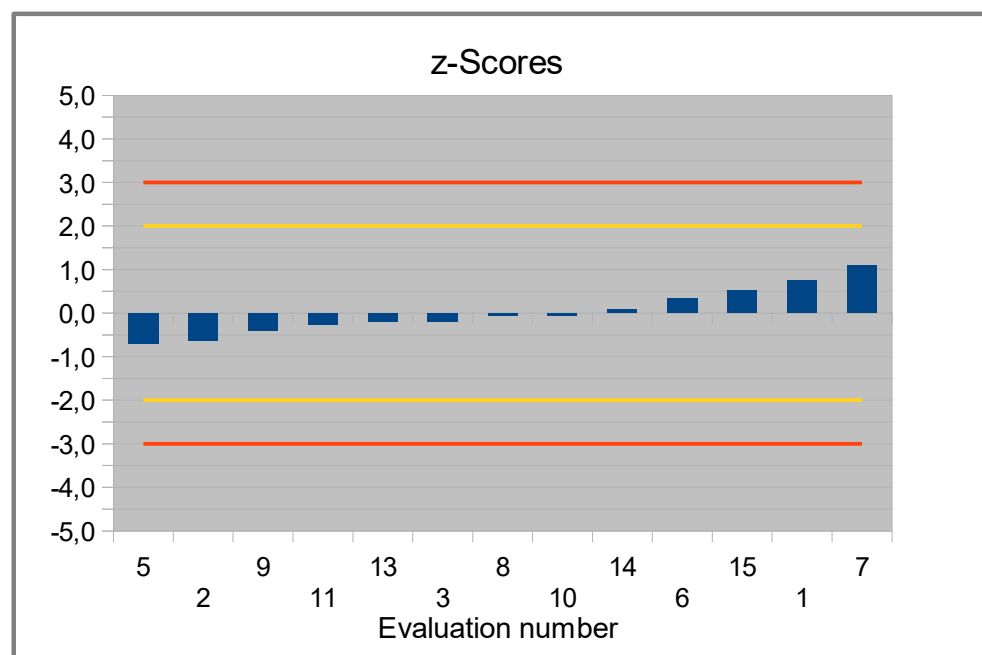


Fig. 24: z-Scores L-Lysine

4.15 L-Methionine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	0,265
Median	0,262
Robust Mean (X_{pt})	0,264
Robust standard deviation (S^*)	0,0204
Number with 2 replicates	12
Repeatability SD (S_r)	0,0108
Repeatability (CV_r)	4,11%
Reproducibility SD (S_R)	0,0250
Reproducibility (CV_R)	9,54%
Target range:	
Target standard deviation σ_{pt}	0,0175
Target standard deviation (for Information)	0,0129
lower limit of target range	0,229
upper limit of target range	0,299
Quotient S^*/σ_{pt}	1,2
Standard uncertainty $U(X_{pt})$	0,00708
Results in the target range	11
Percent in the target range	85%

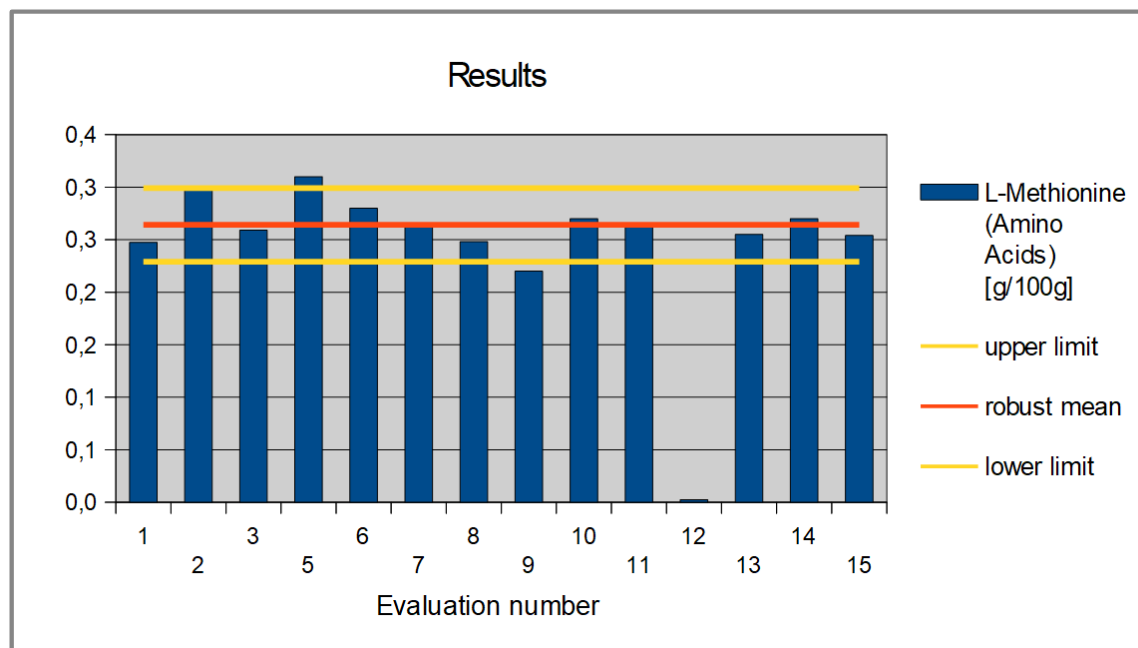


Fig. 25: Results L-Methionine

Results of Participants:

Evaluation number	L-Methionine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,248	-0,017	-0,95	-1,3	
2	0,300	0,036	2,0	2,8	
3	0,259	-0,005	-0,29	-0,40	
5	0,310	0,046	2,6	3,6	
6	0,280	0,016	0,90	1,2	
7	0,262	-0,002	-0,12	-0,17	
8	0,248	-0,016	-0,92	-1,3	
9	0,220	-0,044	-2,5	-3,4	
10	0,270	0,006	0,33	0,45	
11	0,266	0,001	0,08	0,10	
12	0,00253				Outlier excluded
13	0,255	-0,009	-0,52	-0,71	
14	0,270	0,006	0,33	0,45	
15	0,254	-0,010	-0,58	-0,79	

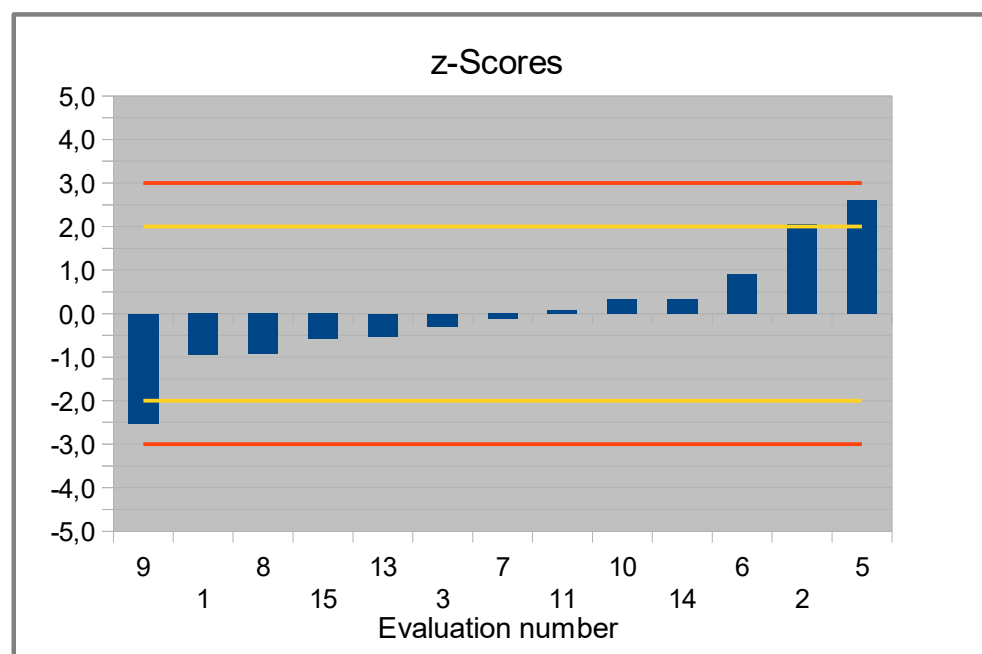


Fig. 26: z-Scores L-Methionine

4.16 L-Phenylalanine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	0,724
Median	0,720
Robust Mean (X_{pt})	0,725
Robust standard deviation (S^*)	0,0308
Number with 2 replicates	12
Repeatability SD (S_r)	0,0245
Repeatability (CV_r)	3,37%
Reproducibility SD (S_R)	0,0344
Reproducibility (CV_R)	4,74%
Target range:	
Target standard deviation σ_{pt}	0,0436
Target standard deviation (for Information)	0,0305
lower limit of target range	0,638
upper limit of target range	0,813
Quotient S^*/σ_{pt}	0,71
Standard uncertainty $U(X_{pt})$	0,0107
Results in the target range	13
Percent in the target range	100%

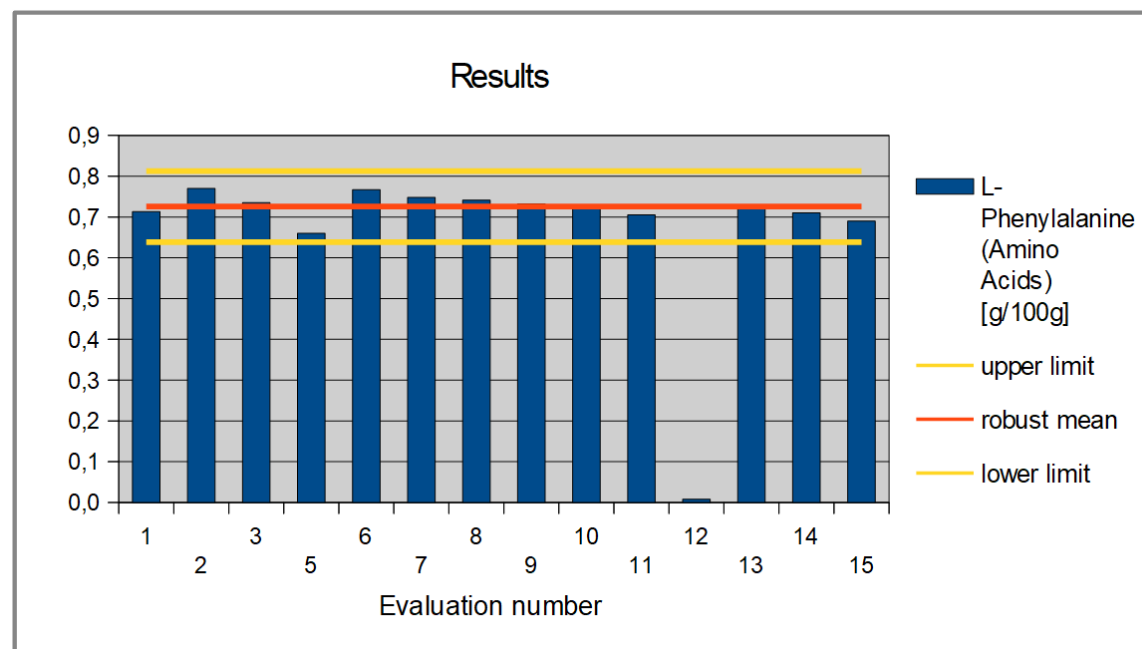


Fig. 27: Results L-Phenylalanine

Results of Participants:

Evaluation number	L-Phenylalanine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,713	-0,012	-0,28	-0,41	
2	0,770	0,045	1,0	1,5	
3	0,735	0,010	0,22	0,32	
5	0,660	-0,065	-1,5	-2,1	
6	0,767	0,042	0,95	1,4	
7	0,748	0,023	0,52	0,74	
8	0,741	0,016	0,36	0,51	
9	0,732	0,007	0,15	0,22	
10	0,720	-0,005	-0,12	-0,18	
11	0,705	-0,020	-0,47	-0,67	
12	0,00823				Outlier excluded
13	0,720	-0,005	-0,12	-0,18	
14	0,710	-0,015	-0,35	-0,51	
15	0,690	-0,035	-0,81	-1,2	

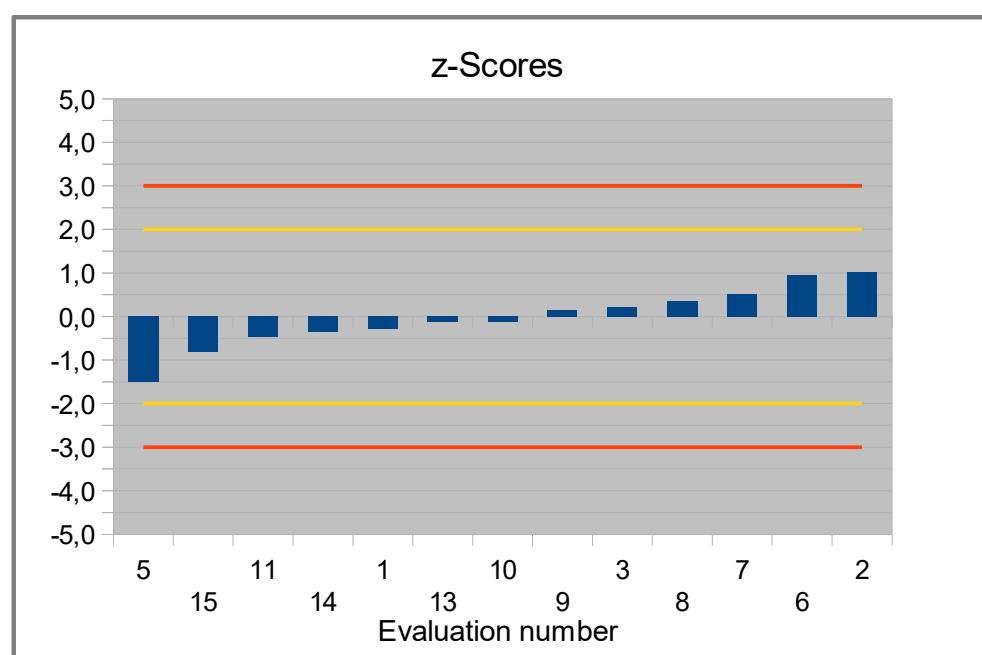


Fig. 28: z-Scores L-Phenylalanine

4.17 L-Proline (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	1,01
Median	1,12
Robust Mean (X_{pt})	1,11
Robust standard deviation (S^*)	0,0322
Number with 2 replicates	11
Repeatability SD (S_r)	0,0318
Repeatability (CV_r)	2,92%
Reproducibility SD (S_R)	0,0943
Reproducibility (CV_R)	8,67%
Target range:	
Target standard deviation σ_{pt}	0,0672
Target standard deviation (for Information)	0,0438
lower limit of target range	0,977
upper limit of target range	1,25
Quotient S^*/σ_{pt}	0,48
Standard uncertainty $U(X_{pt})$	0,0112
Results in the target range	12
Percent in the target range	92%

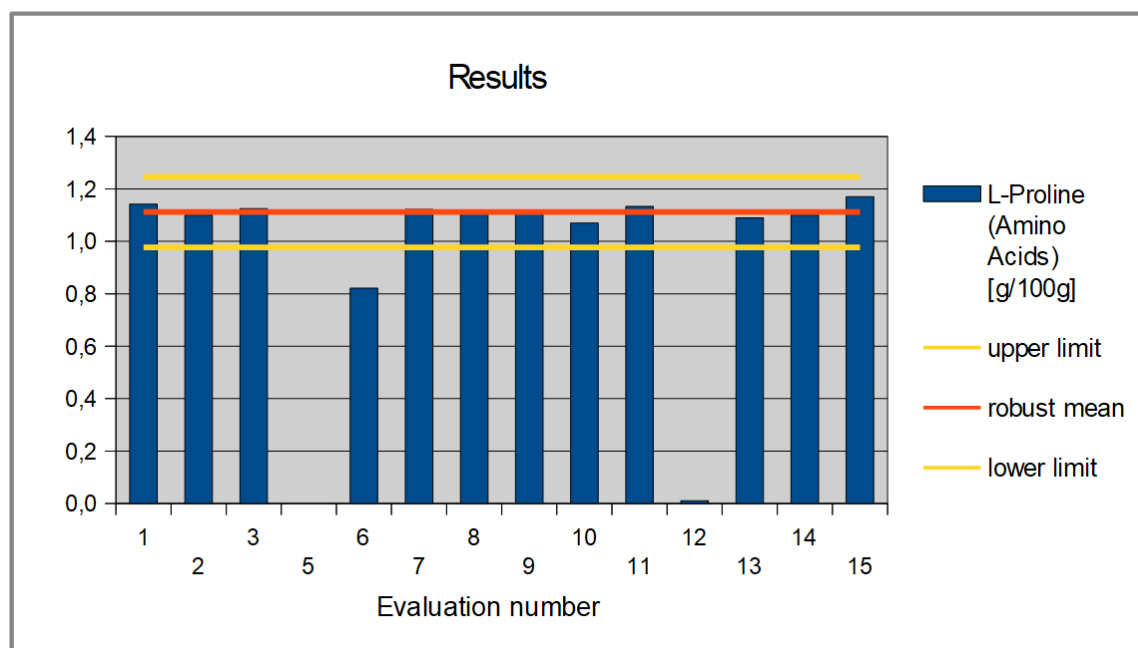
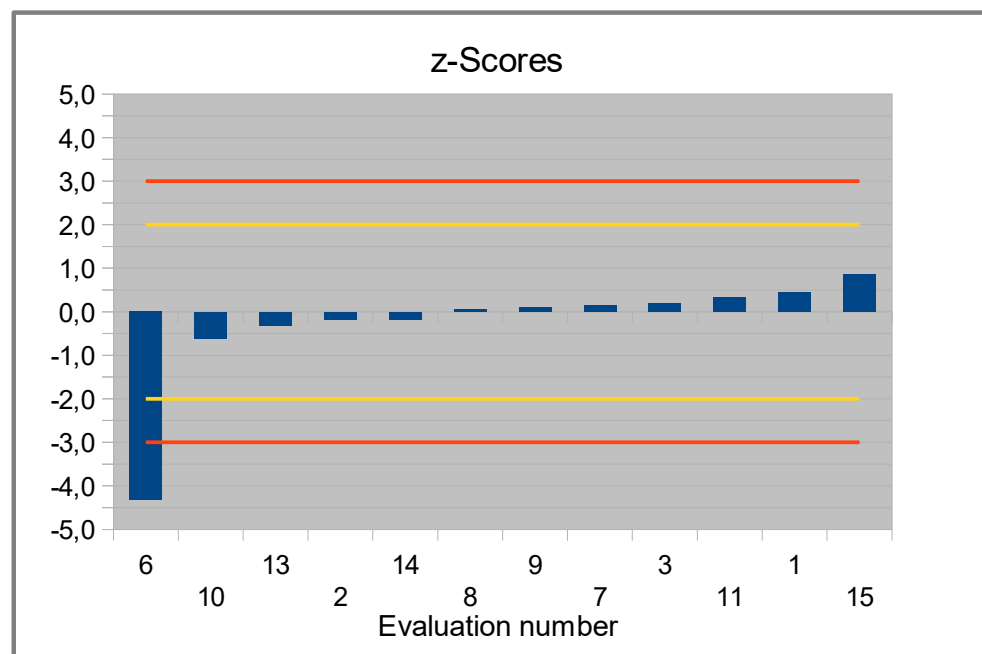


Fig. 29: Results L-Proline

Results of Participants:

Evaluation number	L-Proline (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	1,14	0,030	0,45	0,69	
2	1,10	-0,012	-0,17	-0,27	
3	1,13	0,013	0,20	0,31	
5					
6	0,821	-0,291	-4,3	-6,6	
7	1,12	0,010	0,15	0,24	
8	1,12	0,004	0,07	0,10	
9	1,12	0,006	0,10	0,15	
10	1,07	-0,042	-0,62	-0,95	
11	1,13	0,021	0,32	0,49	
12	0,0108				Outlier excluded
13	1,09	-0,022	-0,32	-0,49	
14	1,10	-0,012	-0,17	-0,27	
15	1,17	0,058	0,87	1,3	

**Fig. 30:** z-Scores L-Proline

4.18 L-Serine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	0,706
Median	0,710
Robust Mean (X_{pt})	0,698
Robust standard deviation (S^*)	0,0490
Number with 2 replicates	12
Repeatability SD (S_r)	0,0185
Repeatability (CV_r)	2,61%
Reproducibility SD (S_R)	0,0815
Reproducibility (CV_R)	11,5%
Target range:	
Target standard deviation σ_{pt}	0,0517
Target standard deviation (for Information)	0,0295
lower limit of target range	0,595
upper limit of target range	0,801
Quotient S^*/σ_{pt}	0,95
Standard uncertainty $U(X_{pt})$	0,0170
Results in the target range	11
Percent in the target range	85%

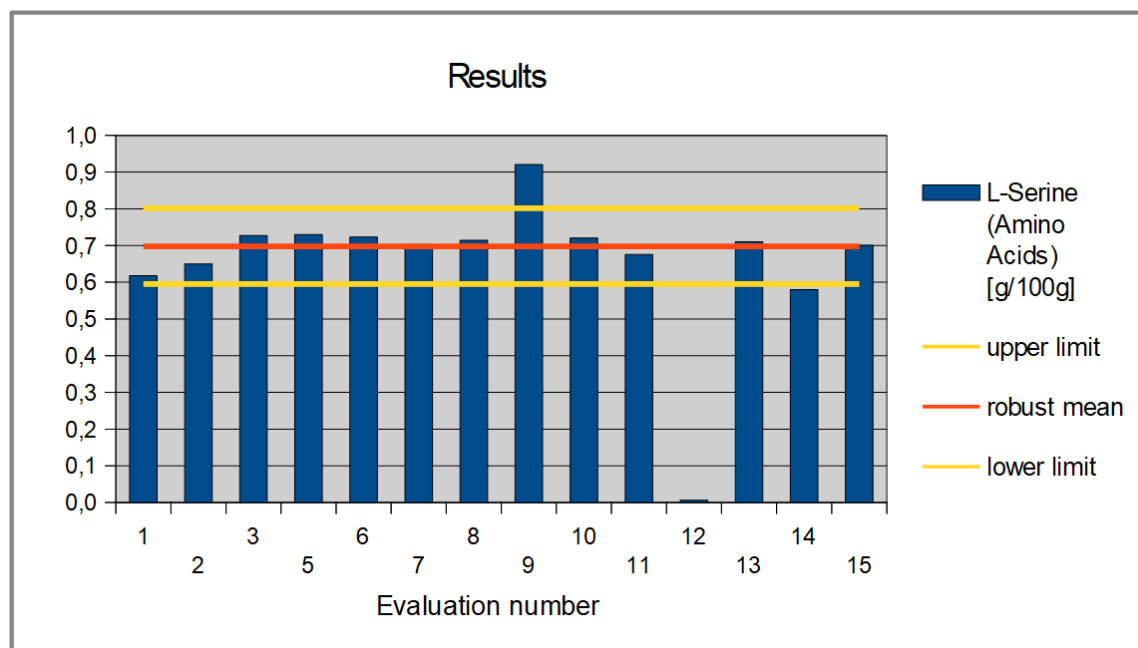


Fig. 31: Results L-Serine

Results of Participants:

Evaluation number	L-Serine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,618	-0,080	-1,5	-2,7	
2	0,650	-0,048	-0,93	-1,6	
3	0,727	0,029	0,56	0,98	
5	0,730	0,032	0,62	1,1	
6	0,723	0,025	0,48	0,85	
7	0,703	0,005	0,10	0,17	
8	0,714	0,016	0,31	0,54	
9	0,921	0,223	4,3	7,6	
10	0,720	0,022	0,43	0,75	
11	0,676	-0,023	-0,44	-0,76	
12	0,00644				Outlier excluded
13	0,710	0,012	0,23	0,41	
14	0,580	-0,118	-2,3	-4,0	
15	0,701	0,003	0,06	0,10	

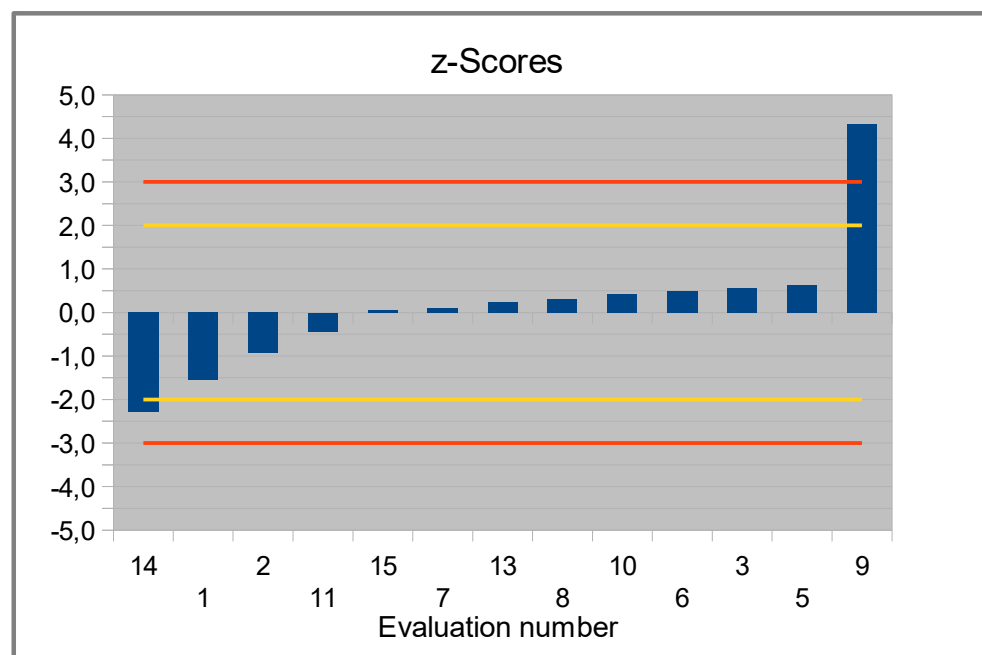


Fig. 32: z-Scores L-Serine

4.19 L-Threonine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	0,756
Median	0,770
Robust Mean (X_{pt})	0,770
Robust standard deviation (S^*)	0,0505
Number with 2 replicates	12
Repeatability SD (S_r)	0,0245
Repeatability (CV_r)	3,23%
Reproducibility SD (S_R)	0,0852
Reproducibility (CV_R)	11,3%
Target range:	
Target standard deviation σ_{pt}	0,0459
Target standard deviation (for Information)	0,0321
lower limit of target range	0,679
upper limit of target range	0,862
Quotient S^*/σ_{pt}	1,1
Standard uncertainty $U(X_{pt})$	0,0175
Results in the target range	12
Percent in the target range	92%

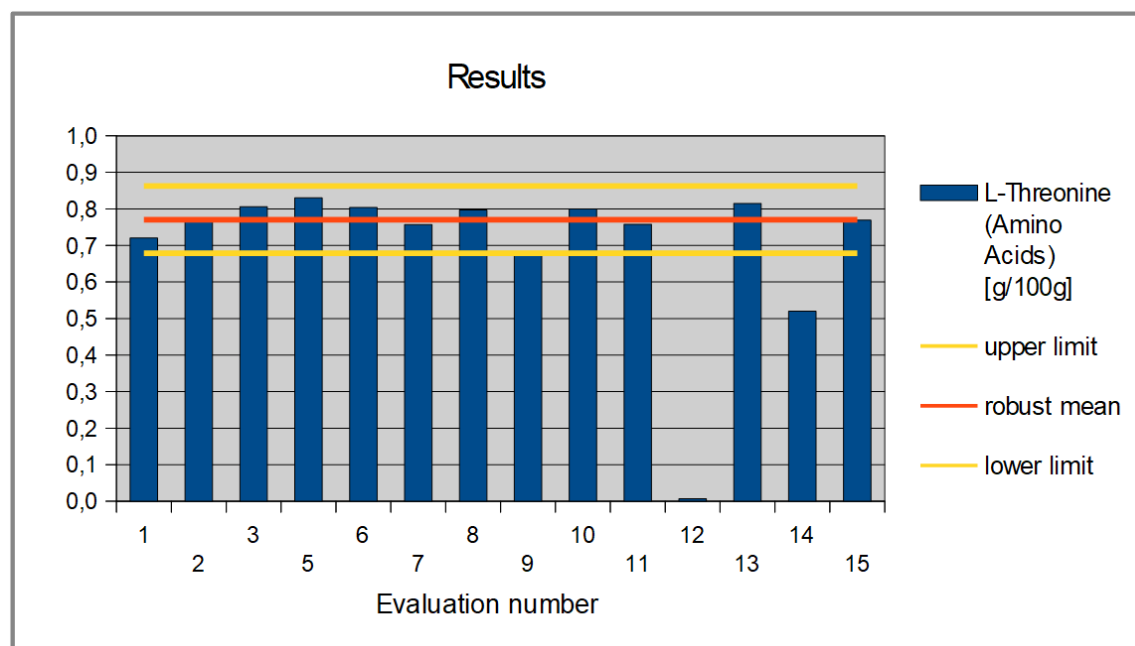


Fig. 33: Results L-Threonine

Results of Participants:

Evaluation number	L-Threonine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,721	-0,050	-1,1	-1,6	
2	0,770	0,000	-0,01	-0,01	
3	0,806	0,036	0,77	1,1	
5	0,830	0,060	1,3	1,9	
6	0,804	0,034	0,73	1,0	
7	0,757	-0,013	-0,29	-0,42	
8	0,797	0,027	0,58	0,83	
9	0,682	-0,088	-1,9	-2,8	
10	0,800	0,030	0,64	0,92	
11	0,758	-0,012	-0,27	-0,39	
12	0,00720				Outlier excluded
13	0,815	0,045	0,97	1,4	
14	0,520	-0,250	-5,5	-7,8	
15	0,769	-0,001	-0,03	-0,05	

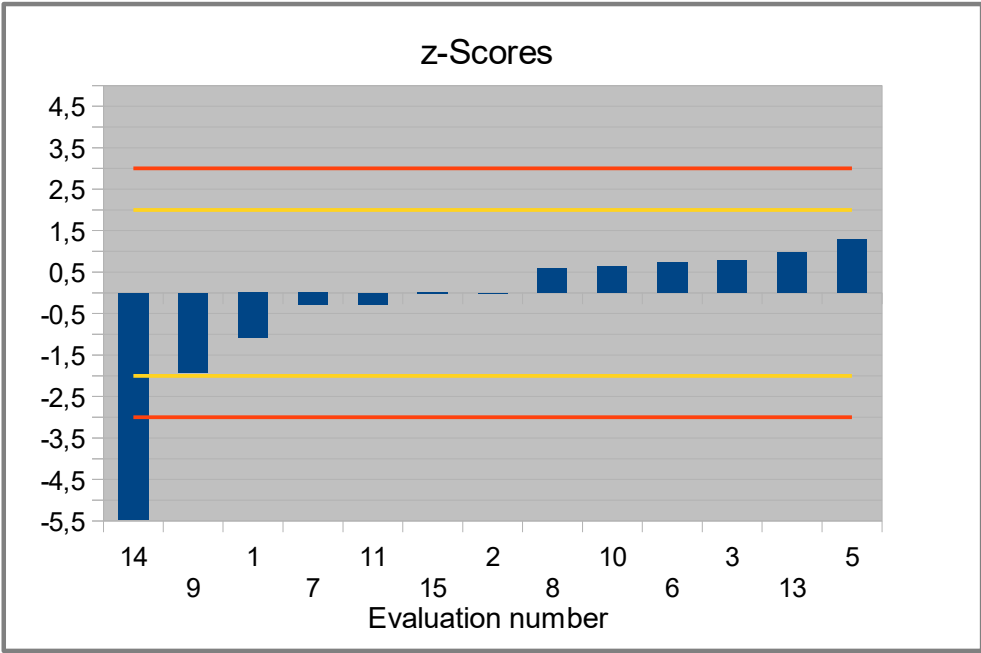


Fig. 34: z-Scores L-Threonine

4.20 L-Tryptophan (in g/100g)

Proficiency Test

Statistic Data	
Number of results	9
Number of outliers	-
Mean	0,305
Median	0,308
Robust Mean (X_{pt})	0,305
Robust standard deviation (S^*)	0,0115
Number with 2 replicates	8
Repeatability SD (S_r)	0,00394
Repeatability (CV_r)	1,30%
Reproducibility SD (S_R)	0,0119
Reproducibility (CV_R)	3,91%
Target range:	
Target standard deviation σ_{pt}	0,0146
Target standard deviation (for Information)	0,0604
lower limit of target range	0,276
upper limit of target range	0,335
Quotient S^*/σ_{pt}	0,79
Standard uncertainty $U(X_{pt})$	0,00480
Results in the target range	9
Percent in the target range	100%

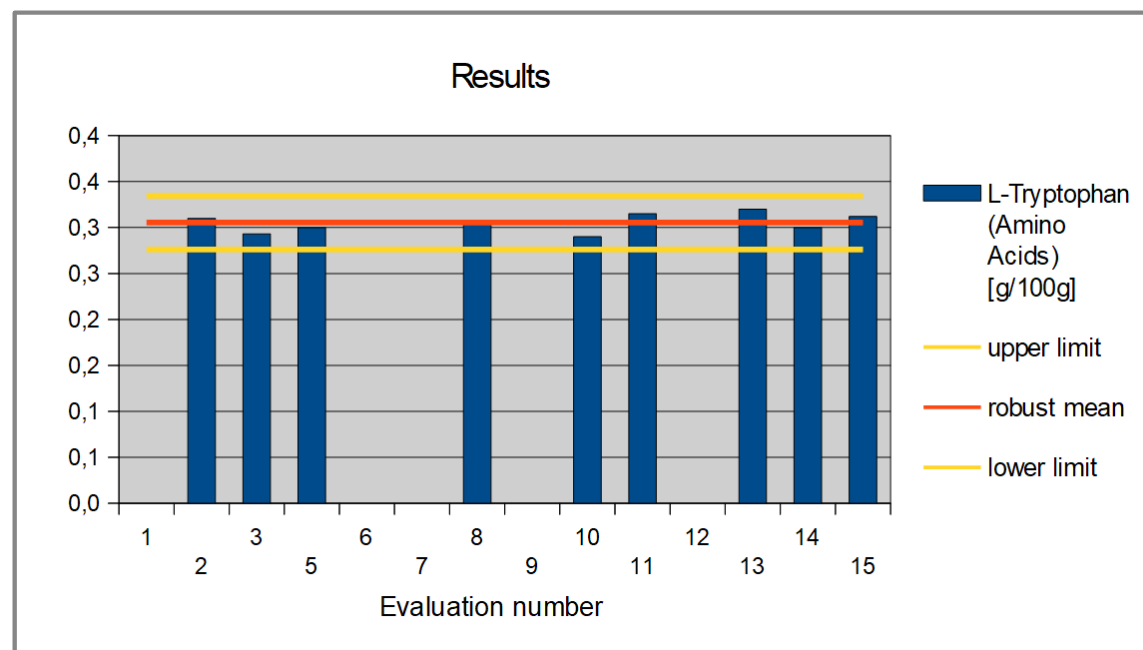


Fig. 35: Results L-Tryptophan

Results of Participants:

Evaluation number	L-Tryptophan (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1					
2	0,310	0,005	0,32	0,08	
3	0,293	-0,012	-0,84	-0,20	
5	0,300	-0,005	-0,37	-0,09	
6					
7					
8	0,308	0,003	0,18	0,04	
9					
10	0,290	-0,015	-1,1	-0,25	
11	0,315	0,010	0,66	0,16	
12					
13	0,320	0,015	1,0	0,24	
14	0,300	-0,005	-0,37	-0,09	
15	0,312	0,007	0,46	0,11	

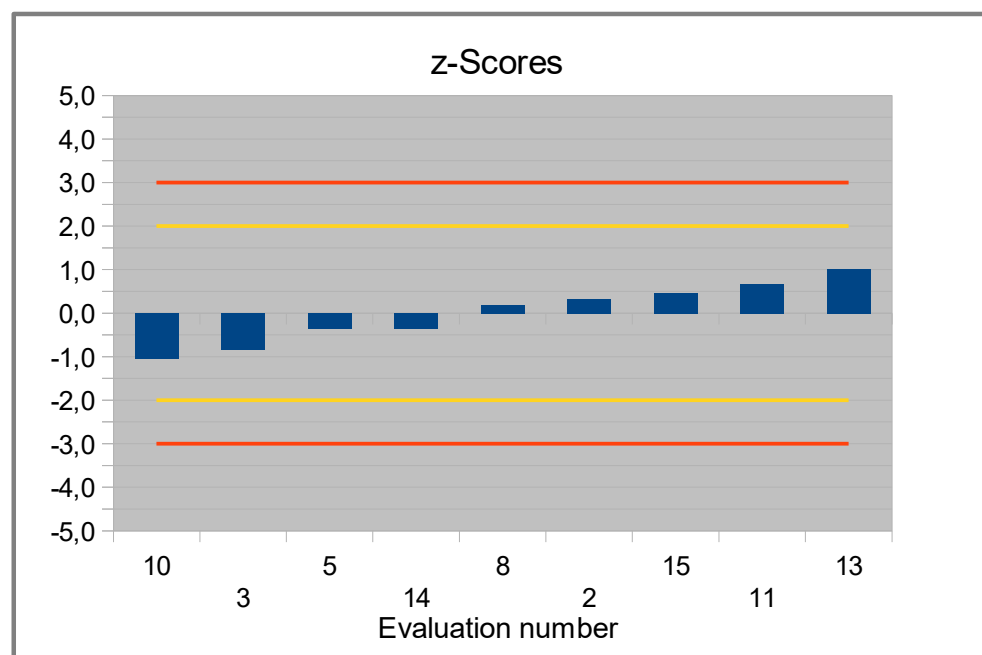


Fig. 36: z-Scores L-Tryptophan

4.21 L-Tyrosine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	0,692
Median	0,702
Robust Mean (X_{pt})	0,698
Robust standard deviation (S^*)	0,0438
Number with 2 replicates	12
Repeatability SD (S_r)	0,0182
Repeatability (CV_r)	2,64%
Reproducibility SD (S_R)	0,0543
Reproducibility (CV_R)	7,85%
Target range:	
Target standard deviation σ_{pt}	0,0513
Target standard deviation (for Information)	0,0295
lower limit of target range	0,596
upper limit of target range	0,801
Quotient S^*/σ_{pt}	0,85
Standard uncertainty $U(X_{pt})$	0,0152
Results in the target range	12
Percent in the target range	92%

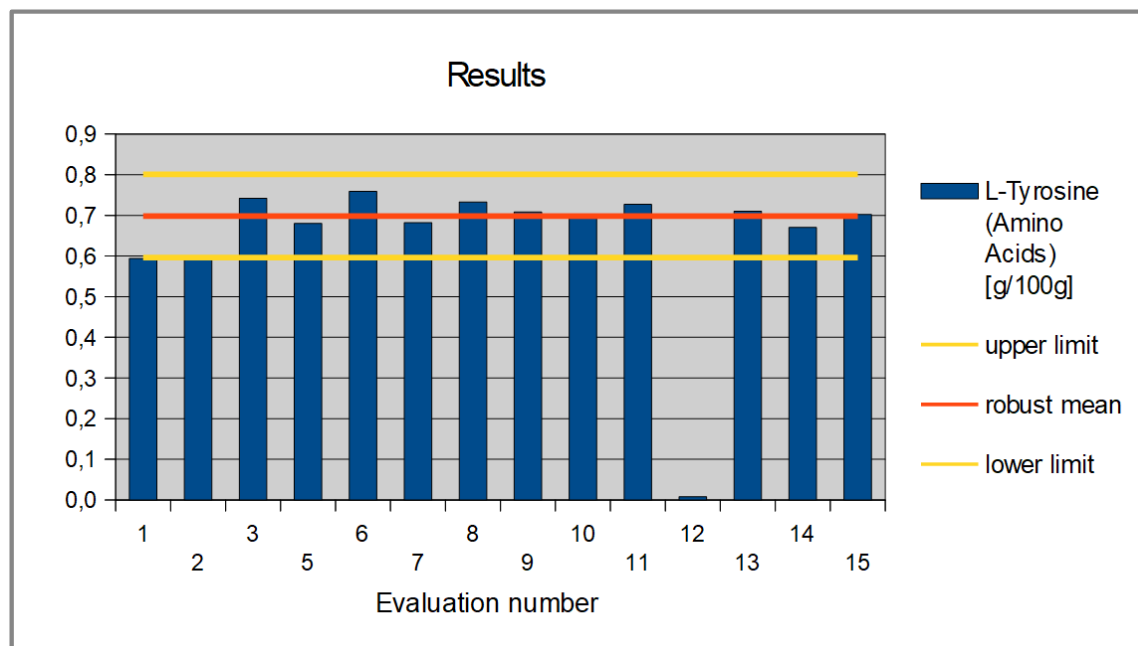


Fig. 37: Results L-Tyrosine

Results of Participants:

Evaluation number	L-Tyrosine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	z-Score (Info)	Remarks
1	0,594	-0,104	-2,0	-3,5	
2	0,590	-0,108	-2,1	-3,7	
3	0,742	0,044	0,85	1,5	
5	0,680	-0,018	-0,36	-0,62	
6	0,759	0,061	1,2	2,1	
7	0,682	-0,016	-0,32	-0,55	
8	0,733	0,035	0,68	1,2	
9	0,708	0,010	0,19	0,33	
10	0,700	0,002	0,03	0,06	
11	0,727	0,029	0,56	0,97	
12	0,00800				Outlier excluded
13	0,710	0,012	0,23	0,40	
14	0,670	-0,028	-0,55	-0,96	
15	0,702	0,004	0,07	0,12	

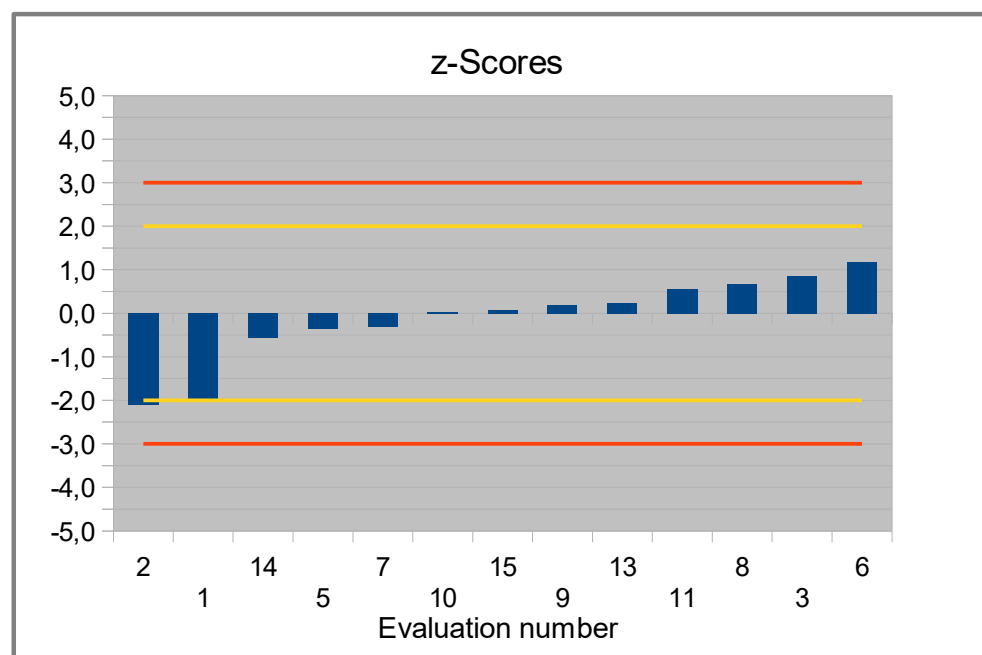


Fig. 38: z-Scores L-Tyrosine

4.22 L-Valine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	13
Number of outliers	1
Mean	1,04
Median	1,03
Robust Mean (X_{pt})	1,04
Robust standard deviation (S^*)	0,0458
Number with 2 replicates	12
Repeatability SD (S_r)	0,0203
Repeatability (CV_r)	1,96%
Reproducibility SD (S_R)	0,0434
Reproducibility (CV_R)	4,18%
Target range:	
Target standard deviation σ_{pt}	0,0413
Target standard deviation (for Information)	0,0505
lower limit of target range	0,956
upper limit of target range	1,12
Quotient S^*/σ_{pt}	1,1
Standard uncertainty $U(X_{pt})$	0,0159
Results in the target range	13
Percent in the target range	100%

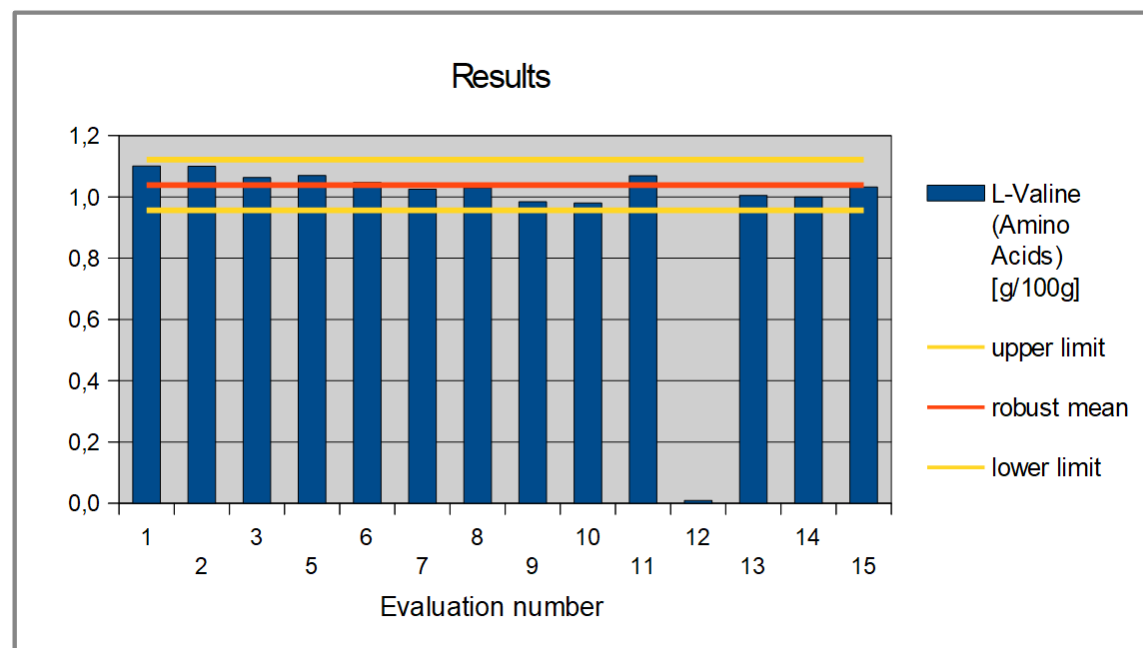
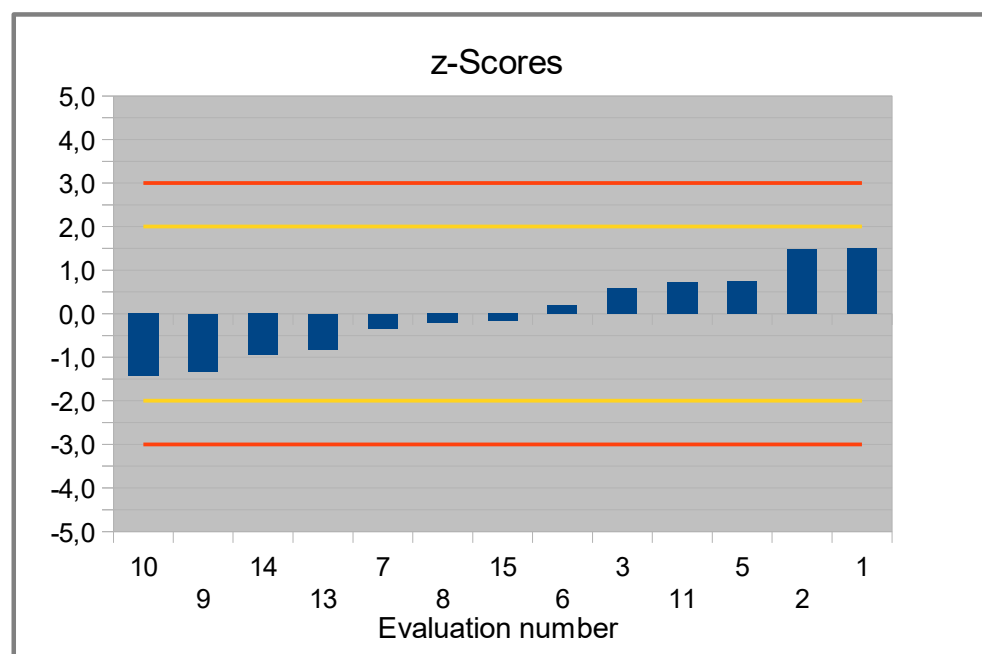


Fig. 39: Results L-Valine

Results of Participants:

Evaluation number	L-Valine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (σ pt)	z-Score (Info)	Remarks
1	1,10	0,062	1,5	1,2	
2	1,10	0,061	1,5	1,2	
3	1,06	0,024	0,58	0,48	
5	1,07	0,031	0,75	0,61	
6	1,05	0,008	0,20	0,16	
7	1,03	-0,014	-0,34	-0,28	
8	1,03	-0,009	-0,22	-0,18	
9	0,984	-0,055	-1,3	-1,1	
10	0,980	-0,059	-1,4	-1,2	
11	1,07	0,030	0,73	0,60	
12	0,00963				Outlier excluded
13	1,01	-0,034	-0,82	-0,67	
14	1,00	-0,039	-0,94	-0,77	
15	1,03	-0,007	-0,17	-0,14	

**Fig. 40:** z-Scores L-Valine

4.23 Taurine (in g/100g)

Proficiency Test

Statistic Data	
Number of results	8
Number of outliers	3
Mean	0,0320
Median	0,0320
Robust Mean (X_{pt})	0,0318
Robust standard deviation (S^*)	0,00194
Number with 2 replicates	8
Repeatability SD (S_r)	0,000901
Repeatability (CV_r)	2,83%
Reproducibility SD (S_R)	0,00222
Reproducibility (CV_R)	6,97%
Target range:	
Target standard deviation σ_{pt}	0,00214
Target standard deviation (for Information)	
lower limit of target range	0,0275
upper limit of target range	0,0361
Quotient S^*/σ_{pt}	0,91
Standard uncertainty $U(X_{pt})$	0,000859
Results in the target range	8
Percent in the target range	100%

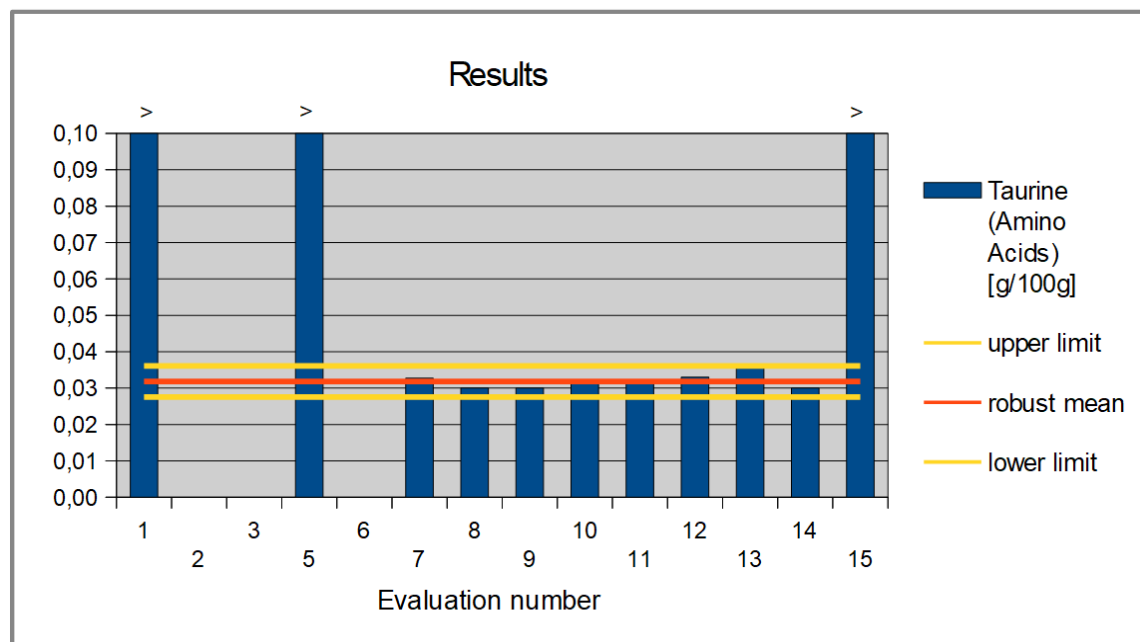
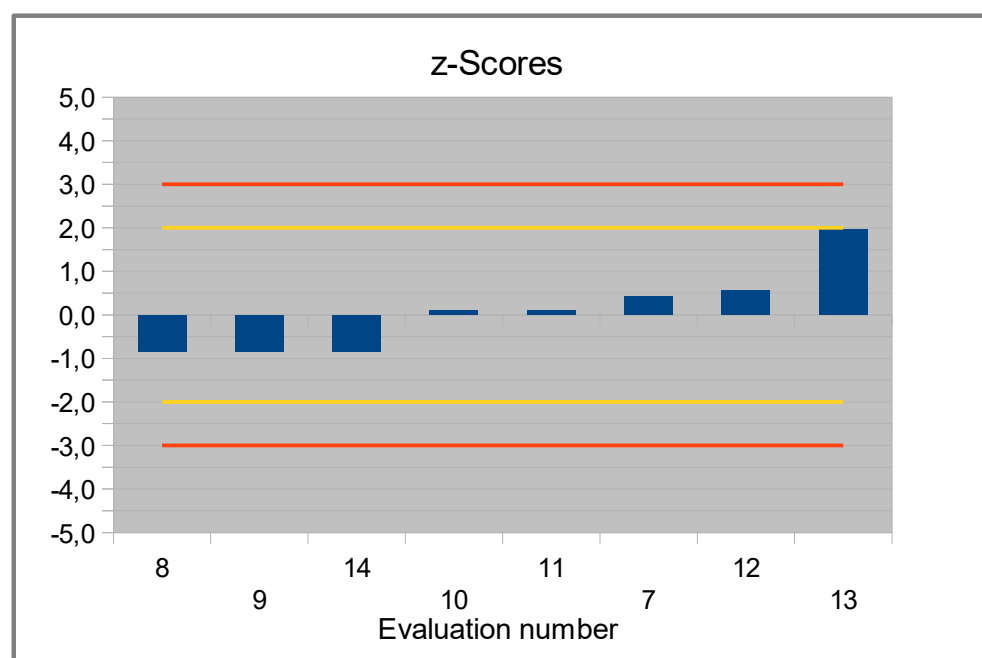


Fig. 41: Results Taurine

Results of Participants:

Evaluation number	Taurine (Amino Acids) [g/100g]	Deviation [g/100g]	z-Score (opt)	Remarks
1	0,234			Outlier excluded
2				
3				
5	0,730			Outlier excluded
6				
7	0,0327	0,000898	0,42	
8	0,0300	-0,00180	-0,84	
9	0,0300	-0,00180	-0,84	
10	0,0320	0,000198	0,09	
11	0,0320	0,000198	0,09	
12	0,0330	0,00120	0,56	
13	0,0360	0,00420	2,0	
14	0,0300	-0,00180	-0,84	
15	392			Outlier excluded

**Fig. 42:** z-Scores Taurine

4.24 Participant z-Scores: overview table

Z-Scores for the assigned values from participants' results (consensus values)

Evaluation number	Ala	Arg	Asp	Cys	Sum + Cys	Glu	Gly	His	Iso	Leu	Lys	Met	Phe	Pro	Ser	Thr	Trp	Tyr	Val	Tau	Successful
	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	z-score	%
1	2,7	-0,22	0,42				-1,7	-0,05	-0,05	0,05	0,75	-0,95	-0,28	0,45	-1,5	-1,1		-2,0	1,5	Outlier	93
2	3,3	-0,36	-1,3		-2,7		-3,3	Outlier	-0,56	-0,61	-0,64	2,0	1,0	-0,17	-0,93	-0,01	0,32	-2,1	1,5		75
3	0,58	-0,85	0,79	-0,27	-0,11	-1,9	2,0	-0,27	0,26	1,3	-0,19	-0,29	0,22	0,20	0,56	0,77	-0,84	0,85	0,58		100
5		0,13	-0,55			-0,46	0,45	-1,1	1,8	-1,6	-0,71	2,6	-1,5		0,62	1,3	-0,37	-0,36	0,75	Outlier	93
6	0,58	-0,26	0,05	-0,31	-0,15		-0,10	-0,09	0,52	1,3	0,33	0,90	0,95	-4,3	0,48	0,73		1,2	0,20		94
7	-0,33	0,52	0,97	0,09	0,26		0,08	Outlier	-0,27	-0,73	1,1	-0,12	0,52	0,15	0,10	-0,29		-0,32	-0,34	0,42	100
8	-0,48	0,03	-0,30	0,26	0,44	0,19	-0,13	0,17	0,23	-0,24	-0,07	-0,92	0,36	0,07	0,31	0,58	0,18	0,68	-0,22	-0,84	100
9	-0,74	-0,04	-1,6		-0,66		0,28	0,01	-0,77	0,82	-0,39	-2,5	0,15	0,10	4,3	-1,9		0,19	-1,3	-0,84	88
10	-0,48	0,27	1,2	0,82	1,0	0,93	0,63	-0,12	-0,32	-0,95	-0,06	0,33	-0,12	-0,62	0,43	0,64	-1,1	0,03	-1,4	0,09	100
11	-2,1	0,36	1,1			0,21		0,18	0,55	1,3	-0,26	0,08	-0,47	0,32	-0,44	-0,27	0,66	0,56	0,73	0,09	94
12	Outlier	Outlier	Outlier		Outlier		Outlier	Outlier	Outlier	Outlier	Outlier	Outlier	Outlier	Outlier	Outlier	Outlier		Outlier	Outlier	0,56	100
13	-0,10	0,34	1,2	-0,16	0,01	-0,11	-1,7	-0,01	0,04	0,35	-0,20	-0,52	-0,12	-0,32	0,23	1,0	1,0	0,23	-0,82	2,0	100
14	-0,48	-0,36	-1,1	0,12	0,29		0,63	0,20	-0,32	-0,61	0,09	0,33	-0,35	-0,17	-2,3	-5,5	-0,37	-0,55	-0,94	-0,84	89
15	-0,14	0,18	-0,93	-0,24	-0,08	0,33	1,7	0,33	-0,08	-0,40	0,52	-0,58	-0,81	0,87	0,06	-0,03	0,46	0,07	-0,17	Outlier	100
Successful %	75	100	100	100	90	100	92	100	100	100	100	85	100	92	85	92	100	92	100	100	

° Successful % without outliers

Valuation of z-score (DIN ISO 13528:2022):

-2 ≤ z-score ≤ 2 successful (in green)

-2 > z-score > 2 warning signal (in yellow)

-3 > z-score > 3 action signal (in red)

outlier = not successful

not evaluated: L-Cysteine, Sum of L-Cysteine and L-Cystine, L-Glutamic Acid

Abbreviations: Ala: L-Alanine; Arg: L-Arginine; Asp: L-Aspartic acid; Cys: L-Cystine; Sum: Sum of L-Cysteine + L-Cystine; Glu: L-Glutamine; Gly: Glycine; His: L-Histidine; Iso: L-Isoleucine; Leu: L-Leucine; Lys: L-Lysine; Met: L-Methionine; Phe: L-Phenylalanine; Pro: L-Proline; Ser: L-Serine; Thr: L-Threonine; Trp: L-Tryptophan; Tyr: L-Tyrosine; Val: L-Valine; Tau: Taurine

5. Documentation

5.1 Details by the participants

Note: Information given in German were translated by DLA to the best of our knowledge (without guarantee of correctness).

5.1.1 Primary data

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Alanine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,68	0,69	0,68	0,078	no	
	2	g/100g	17	93	2025-09-17	0,7	0,63	0,76	0,02	no	
	3	g/100g	30	80	2025-09-04	0,63	0,6	0,66	0,00038	no	
	5	g/100g	32	78	2025-09-26					no	
	6	g/100g	90	20	2025-09-12	0,63	0,63	0,63	0,0029	no	107
	7	g/100g	46	64	2025-09-11	0,6	0,6	0,6			
	8	g/100g	0.605	0.595	2025-09-19	0,6	0,61	0,6	0,01	no	
	9	g/100g	41	69	2025-09-29	0,59	0,62	0,57		yes	
	10	g/100g	22	88	2025-10-23	0,6	0,6	0,59		no	
	11	g/100g	38	72	2025-09-25	0,56	0,56	0,56	0,05	no	
	12	g/100g	10	10	2025-09-25	0	0	0	0.00149	no	
	13	g/100g	02	108	2025-09-26	0,61	0,6	0,62	0,01	no	
	14	g/100g	12	98	2025-09-09	0,6	0,61	0,59	0,05	yes	
	15	g/100g	35	75	2025-09-15	0,61				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Arginine (Amino Acids)	1	g/100g	26	84	2025-09-18	1,02	1	1,04	0,078	no	
	2	g/100g	17	93	2025-09-17	1	1	1	0,02	no	
	3	g/100g	30	80	2025-09-04	0,93	0,9	0,96	0,00057	no	
	5	g/100g	32	78	2025-09-26	1,07	1,05	1,09		no	
	6	g/100g	90	20	2025-09-12	1,02	1,01	1,02	0,0050	no	94
	7	g/100g	46	64	2025-09-11	1,13	1,14	1,11			
	8	g/100g	1.066	1.045	2025-09-19	1,06	1,07	1,05	0,01	no	
	9	g/100g	41	69	2025-09-29	1,05	1,06	1,04		no	
	10	g/100g	22	88	2025-10-23	1,09	1,07	1,12			
	11	g/100g	38	72	2025-09-25	1,1	1,1	1,11	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00231	no	
	13	g/100g	02	108	2025-09-26	1,1	1,09	1,11	0,01	no	
	14	g/100g	12	98	2025-09-09	1	1	1	0,05	no	
	15	g/100g	35	75	2025-09-15	1,08				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Aspartic acid (Amino Acids)	1	g/100g	26	84	2025-09-18	1,02	1,05	1,04	0,078	no	
	2	g/100g	17	93	2025-09-17	0,95	0,96	0,94	0,02	no	
	3	g/100g	30	80	2025-09-04	1,03	1	1,06	0,00051	no	
	5	g/100g	32	78	2025-09-26	0,98	1,01	0,94		no	
	6	g/100g	90	20	2025-09-12	1	1	1,01	0,00090	no	99
	7	g/100g	46	64	2025-09-11	1,04	1,06	1,02			
	8	g/100g	0.993	0.986	2025-09-19	0,99	0,99	0,99	0,01	no	
	9	g/100g	41	69	2025-09-29	0,94	0,98	0,9		no	
	10	g/100g	22	88	2025-10-23	1,05	1,03	1,07			
	11	g/100g	38	72	2025-09-25	1,05	1,05	1,05	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00743	no	
	13	g/100g	02	108	2025-09-26	1,05	1,04	1,06	0,01	no	
	14	g/100g	12	98	2025-09-09	0,96	0,96	0,95	0,05	no	
	15	g/100g	35	75	2025-09-15	0,97				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Cystine (Amino Acids)	1	g/100g									
	2	g/100g	17	93	2025-09-17				0,02		
	3	g/100g	30	80	2025-09-04	0,39	0,38	0,4	0,00041	no	
	5	g/100g	32	78						no	
	6	g/100g	90	20	2025-09-12	0,39	0,42	0,35	0,0102	no	94
	7	g/100g	46	64	2025-09-11	0,42	0,41	0,43			
	8	g/100g	0.431	0.429	2025-09-19	0,43	0,43	0,43	0,01	no	
	9	g/100g	41	69							
	10	g/100g	22	88	2025-10-23	0,47	0,47	0,47			
	11	g/100g	38	72							
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00743	no	
	13	g/100g	02	108	2025-09-26	0,4	0,39	0,41	0,01	no	
	14	g/100g	12	98	2025-09-09	0,42	0,42	0,42	0,05	no	
	15	g/100g	35	75	2025-09-15	0,39				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
Sum L-Cysteine / L-Cystin (Amino Acids)	1	g/100g									
	2	g/100g	17	93	2025-09-17	0,21	0,19	0,22	0,02	no	
	3	g/100g	30	80	2025-09-04						
	5	g/100g	32	78	2025-09-26	<0,1	<0,1	<0,1		no	
	6	g/100g									
	7	g/100g	46	64	2025-09-11						
	8	g/100g	-	-		-					
	9	g/100g	41	69	2025-09-29	0,35	0,38	0,33		no	
	10	g/100g									
	11	g/100g	38	72							
	12	g/100g	10	10	2025-09-25					no	
	13	g/100g									
	14	g/100g									
	15	g/100g	35	75						yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Cystine (Amino Acids)	1	g/100g									
Sum L-Cysteine / L-Cystin (Amino Acids)	2	g/100g	17	93	2025-09-17	0,21	0,19	0,22	0,02	no	
L-Cystine (Amino Acids)	3	g/100g	30	80	2025-09-04	0,39	0,38	0,4	0,00041	no	
Sum L-Cysteine / L-Cystin (Amino Acids)	5	g/100g	32	78	2025-09-26	<0,1	<0,1	<0,1		no	
L-Cystine (Amino Acids)	6	g/100g	90	20	2025-09-12	0,39	0,42	0,35	0,0102	no	94
L-Cystine (Amino Acids)	7	g/100g	46	64	2025-09-11	0,42	0,41	0,43			
L-Cystine (Amino Acids)	8	g/100g	0.431	0.429	2025-09-19	0,43	0,43	0,43	0,01	no	
Sum L-Cysteine / L-Cystin (Amino Acids)	9	g/100g	41	69	2025-09-29	0,35	0,38	0,33		no	
L-Cystine (Amino Acids)	10	g/100g	22	88	2025-10-23	0,47	0,47	0,47			
L-Cystine (Amino Acids)	11	g/100g	38	72							
L-Cystine (Amino Acids)	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00743	no	
L-Cystine (Amino Acids)	13	g/100g	02	108	2025-09-26	0,4	0,39	0,41	0,01	no	
L-Cystine (Amino Acids)	14	g/100g	12	98	2025-09-09	0,42	0,42	0,42	0,05	no	
L-Cystine (Amino Acids)	15	g/100g	35	75	2025-09-15	0,39				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Glutamine (Amino Acids)	1	g/100g									
	2	g/100g	17	93	2025-09-17				0,02		
	3	g/100g	30	80	2025-09-04	1,13	1,12	1,14	0,00163	no	
	5	g/100g	32	78	2025-09-26	1,25	1,3	1,2		no	
	6	g/100g								no	
	7	g/100g	46	64	2025-09-11						
	8	g/100g	1.304	1.308	2025-09-19	1,31	1,3	1,31	0,01	no	
	9	g/100g	41	69							
	10	g/100g	22	88	2025-10-22	1,37	1,35	1,4			
	11	g/100g	38	72	2025-09-25	1,31	1,28	1,34	0,1	no	
	12	g/100g	10	10	2025-09-25					no	
	13	g/100g	02	108	2025-09-26	1,28	1,28	1,28	0,01	no	
	14	g/100g									
	15	g/100g	35	75	2025-09-15	1,32				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Glutaminc acid (Amino Acids)	1	g/100g	26	84	2025-09-18	1,34	1,37	1,35	0,078	no	
	2	g/100g	17	93	2025-09-17	<0,02	<0,02	<0,02	0,02	no	
	3	g/100g	30	80	2025-09-04						
	5	g/100g	32	78	2025-09-26	0,03	0,03	0,03		no	
	6	g/100g								no	
	7	g/100g	46	64	2025-09-11	0,09	0,07	0,11			
	8	g/100g	0.009	0.011	2025-09-19	0,01	0,01	0,01	0,01	no	
	9	g/100g	41	69	2025-09-29	<0,01	< 0,01	<0,01	0,01	no	
	10	g/100g									
	11	g/100g	38	72	2025-09-25	<0,07	<0,07	<0,07	0,07	no	
	12	g/100g	10	10	2025-09-25	<0.00792	< LOQ	< LOQ	0.00792	no	
	13	g/100g	02	108	2025-09-26	<0,01	<0,01	<0,01	0,01	no	
	14	g/100g	12	98	2025-09-09	0	0	0	0,05	no	
	15	g/100g								yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
Glycine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,83	1	0,91	0,078	no	
	2	g/100g	17	93	2025-09-17	0,74	0,81	0,68	0,02	no	
	3	g/100g	30	80	2025-09-04	1,04	0,99	1,09	0,00039	no	
	5	g/100g	32	78	2025-09-26	0,95	1,05	0,85		no	
	6	g/100g	90	20	2025-09-12	0,92	0,94	0,9	0,0023	no	103
	7	g/100g	46	64	2025-09-11	0,93	0,95	0,91			
	8	g/100g				0,92	0,93	0,9	0,01	no	
	9	g/100g	41	69	2025-09-29	0,94	0,99	0,9		no	
	10	g/100g	22	88	2025-10-23	0,96	0,99	0,94			
	11	g/100g	38	72	2025-09-25					no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00396	no	
	13	g/100g	02	108	2025-09-26	0,83	0,83	0,83	0,01	no	
	14	g/100g	12	98	2025-09-09	0,96	0,94	0,98	0,05	no	
	15	g/100g	35	75	2025-09-15	1,02				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Histidine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,58	0,6	0,59	0,078	no	
	2	g/100g	17	93	2025-09-17	1,4	1,4	1,4	0,02	no	
	3	g/100g	30	80	2025-09-04	0,56	0,55	0,56	0,00069	no	
	5	g/100g	32	78	2025-09-26	0,48	0,5	0,46		no	
	6	g/100g	90	20	2025-09-12	0,57	0,57	0,58	0,0097	no	90
	7	g/100g	46	64	2025-09-11	1,54	1,53	1,56			
	8	g/100g	0.604	0.591		0,6	0,6	0,59	0,01	no	
	9	g/100g	41	69	2025-09-29	0,58	0,58	0,58		no	
	10	g/100g	22	88	2025-10-23	0,57	0,56	0,57			
	11	g/100g	38	72	2025-09-25	0,6	0,61	0,59	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00083	no	
	13	g/100g	02	108	2025-09-26	0,58	0,57	0,59	0,01	no	
	14	g/100g	12	98	2025-09-09	0,6	0,59	0,6	0,05	no	
	15	g/100g	35	75	2025-09-15	0,61				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Isoleucine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,91	0,92	0,92	0,078	no	
	2	g/100g	17	93	2025-09-17	0,89	0,87	0,91	0,02	no	
	3	g/100g	30	80	2025-09-04	0,92	0,91	0,94	0,0007	no	
	5	g/100g	32	78	2025-09-26	0,99	1,02	0,95		no	
	6	g/100g	90	20	2025-09-12	0,94	0,93	0,94	0,0063	no	111
	7	g/100g	46	64	2025-09-11	0,9	0,89	0,92			
	8	g/100g	0.912	0.934		0,92	0,91	0,93	0,01	no	
	9	g/100g	41	69	2025-09-29	0,88	0,91	0,85		no	
	10	g/100g	22	88	2025-10-23	0,9	0,9	0,9			
	11	g/100g	38	72	2025-09-25	0,94	0,95	0,93	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00462	no	
	13	g/100g	02	108	2025-09-26	0,92	0,91	0,92	0,01	no	
	14	g/100g	12	98	2025-09-09	0,9	0,89	0,9	0,05	no	
	15	g/100g	35	75	2025-09-15	0,91				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Leucine (Amino Acids)	1	g/100g	26	84	2025-09-18	1,54	1,57	1,56	0,078	no	
	2	g/100g	17	93	2025-09-17	1,5	1,5	1,6	0,02	no	
	3	g/100g	30	80	2025-09-04	1,61	1,58	1,63	0,00091	no	
	5	g/100g	32	78	2025-09-26	1,44	1,43	1,45		no	
	6	g/100g	90	20	2025-09-12	1,61	1,6	1,62	0,0022	no	94
	7	g/100g	46	64	2025-09-11	1,49	1,48	1,5			
	8	g/100g	1.479	1.563		1,52	1,48	1,56	0,01	no	
	9	g/100g	41	69	2025-09-29	1,58	1,64	1,53		no	
	10	g/100g	22	88	2025-10-23	1,48	1,47	1,49			
	11	g/100g	38	72	2025-09-25	1,61	1,62	1,61	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00149	no	
	13	g/100g	02	108	2025-09-26	1,56	1,55	1,56	0,01	no	
	14	g/100g	12	98	2025-09-09	1,5	1,5	1,5	0,05	no	
	15	g/100g	35	75	2025-09-15	1,51				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Lysine (Amino Acids)	1	g/100g	26	84	2025-09-18	1,19	1,24	1,22	0,078	no	
	2	g/100g	17	93	2025-09-17	1	0,96	1	0,02	no	
	3	g/100g	30	80	2025-09-04	1,06	1,03	1,1	0,00047	no	
	5	g/100g	32	78	2025-09-26	0,99	1,04	0,93		no	
	6	g/100g	90	20	2025-09-12	1,13	1,12	1,15	0,0037	no	95
	7	g/100g	46	64	2025-09-11	1,24	1,21	1,26			
	8	g/100g	1.099	1.060		1,08			0,01	no	
	9	g/100g	41	69	2025-09-29	1,03	1,04	1,02		no	
	10	g/100g	22	88	2025-10-23	1,08	1,05	1,12			
	11	g/100g	38	72	2025-09-25	1,05	1,06	1,04	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.0038	no	
	13	g/100g	02	108	2025-09-26	1,06	1,06	1,06	0,01	no	
	14	g/100g	12	98	2025-09-09	1,1	1,1	1,1	0,05	no	
	15	g/100g	35	75	2025-09-15	1,16				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Methionine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,25	0,23	0,24	0,078	no	
	2	g/100g	17	93	2025-09-17	0,3	0,3	0,29	0,02	no	
	3	g/100g	30	80	2025-09-04	0,26	0,25	0,26	0,00042	no	
	5	g/100g	32	78	2025-09-26	0,31	0,3	0,31		no	
	6	g/100g	90	20	2025-09-12	0,28	0,29	0,27	0,0029	no	93
	7	g/100g	46	64	2025-09-11	0,26	0,27	0,25			
	8	g/100g	0.246	0.251		0,25	0,25	0,25	0,01	no	
	9	g/100g	41	69	2025-09-29	0,22	0,24	0,2		no	
	10	g/100g	22	88	2025-10-23	0,27	0,26	0,27			
	11	g/100g	38	72	2025-09-25	0,27	0,27	0,26	0,1	no	
	12	g/100g	10	10	2025-09-25	0	0	0	0.00215	no	
	13	g/100g	02	108	2025-09-26	0,26	0,25	0,26	0,01	no	
	14	g/100g	12	98	2025-09-09	0,27	0,26	0,27	0,05	no	
	15	g/100g	35	75	2025-09-15	0,25				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Phenylalanine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,71	0,71	0,71	0,078	no	
	2	g/100g	17	93	2025-09-17	0,77	0,79	0,75	0,02	no	
	3	g/100g	30	80	2025-09-04	0,74	0,72	0,75	0,00067	no	
	5	g/100g	32	78	2025-09-26	0,66	0,63	0,69		no	
	6	g/100g	90	20	2025-09-12	0,77	0,76	0,78	0,0030	no	99
	7	g/100g	46	64	2025-09-11	0,75	0,74	0,75			
	8	g/100g	0.728	0.753		0,74	0,73	0,75	0,01	no	
	9	g/100g	41	69	2025-09-29	0,73	0,77	0,69		no	
	10	g/100g	22	88	2025-10-23	0,72	0,71	0,72			
	11	g/100g	38	72	2025-09-25	0,71	0,71	0,7	0,08	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00182	no	
	13	g/100g	02	108	2025-09-26	0,72	0,71	0,73	0,01	no	
	14	g/100g	12	98	2025-09-09	0,71	0,71	0,71	0,05	no	
	15	g/100g	35	75	2025-09-15	0,69				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Limit of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Proline (Amino Acids)	1	g/100g	26	84	2025-09-18	1,14	1,17	1,16	0,078	no	
	2	g/100g	17	93	2025-09-17	1,1	1,1	1,1	0,02	no	
	3	g/100g	30	80	2025-09-04	1,13	1,12	1,13	0,00114	no	
	5	g/100g	32	78						no	
	6	g/100g	90	20	2025-09-12	0,82	0,83	0,81	0,0082	no	107
	7	g/100g	46	64	2025-09-11	1,12	1,12	1,13			
	8	g/100g	1.131	1.100		1,12	1,13	1,1	0,01	no	
	9	g/100g	41	69	2025-09-29	1,12	1,18	1,06		no	
	10	g/100g	22	88	2025-10-23	1,07	1,04	1,11			
	11	g/100g	38	72	2025-09-25	1,13	1,14	1,13	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00446	no	
	13	g/100g	02	108	2025-09-26	1,09	1,09	1,09	0,01	no	
	14	g/100g	12	98	2025-09-09	1,1	1,1	1,1	0,05	no	
	15	g/100g	35	75	2025-09-15	1,17				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Serine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,62	0,64	0,63	0,078	no	
	2	g/100g	17	93	2025-09-17	0,65	0,64	0,67	0,02	no	
	3	g/100g	30	80	2025-09-04	0,73	0,71	0,74	0,00056	no	
	5	g/100g	32	78	2025-09-26	0,73	0,75	0,71		no	
	6	g/100g	90	20	2025-09-12	0,72	0,72	0,72	0,0029	no	94
	7	g/100g	46	64	2025-09-11	0,7	0,69	0,71			
	8	g/100g	0.719	0.709		0,71	0,72	0,71	0,01	no	
	9	g/100g	41	69	2025-09-29	0,92	0,94	0,91		no	
	10	g/100g	22	88	2025-10-23	0,72	0,71	0,72			
	11	g/100g	38	72	2025-09-25	0,68	0,69	0,66	0,05	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00462	no	
	13	g/100g	02	108	2025-09-26	0,71	0,71	0,71	0,01	no	
	14	g/100g	12	98	2025-09-09	0,58	0,61	0,56	0,05	no	
	15	g/100g	35	75	2025-09-15	0,7				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Threonine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,72	0,74	0,73	0,078	no	
	2	g/100g	17	93	2025-09-17	0,77	0,74	0,8	0,02	no	
	3	g/100g	30	80	2025-09-04	0,81	0,8	0,82	0,00065	no	
	5	g/100g	32	78	2025-09-26	0,83	0,83	0,82		no	
	6	g/100g	90	20	2025-09-12	0,8	0,8	0,81	0,0025	no	106
	7	g/100g	46	64	2025-09-11	0,76	0,75	0,77			
	8	g/100g	0.807	0.787		0,8	0,81	0,79	0,01	no	
	9	g/100g	41	69	2025-09-29	0,68	0,72	0,65		no	
	10	g/100g	22	88	2025-10-23	0,8	0,82	0,79			
	11	g/100g	38	72	2025-09-25	0,76	0,78	0,73	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00165	no	
	13	g/100g	02	108	2025-09-26	0,82	0,81	0,82	0,01	no	
	14	g/100g	12	98	2025-09-09	0,52	0,51	0,54	0,05	no	
	15	g/100g	35	75	2025-09-15	0,77				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Tryptophan (Amino Acids)	1	g/100g									
	2	g/100g	17	93	2025-09-17	0,31	0,31	0,31	0,02	no	
	3	g/100g	30	80	2025-09-04	0,29	0,29	0,3	0,00172	no	
	5	g/100g	32	78	2025-09-26	0,3	0,3	0,3		no	
	6	g/100g								no	
	7	g/100g	46	64	2025-09-11						
	8	g/100g	0.307	0.309		0,31	0,31	0,31	0,01	no	
	9	g/100g	41	69	2025-09-29					no	
	10	g/100g	22	88	2025-10-24	0,29	0,28	0,29			
	11	g/100g	38	72	2025-09-25	0,32	0,32	0,31	0,1	no	
	12	g/100g	10	10	2025-09-25					no	
	13	g/100g	02	108	2025-09-26	0,32	0,32	0,32	0,01	no	
	14	g/100g	12	98	2025-09-09	0,3	0,3	0,3	0,02	no	
	15	g/100g	35	75	2025-09-15	0,31				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Tyrosine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,59	0,59	0,59	0,078	no	
	2	g/100g	17	93	2025-09-17	0,59	0,61	0,58	0,02	no	
	3	g/100g	30	80	2025-09-04	0,74	0,72	0,76	0,00043	no	
	5	g/100g	32	78	2025-09-26	0,68	0,65	0,7		no	
	6	g/100g	90	20	2025-09-12	0,76	0,76	0,76	0,0029	no	106
	7	g/100g	46	64	2025-09-11	0,68	0,67	0,69			
	8	g/100g	0.719	0.746		0,73	0,72	0,75	0,01	no	
	9	g/100g	41	69	2025-09-29	0,71	0,72	0,7		no	
	10	g/100g	22	88	2025-10-23	0,7	0,7	0,7			
	11	g/100g	38	72	2025-09-25	0,73	0,74	0,71	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00347	no	
	13	g/100g	02	108	2025-09-26	0,71	0,7	0,72	0,01	no	
	14	g/100g	12	98	2025-09-09	0,67	0,67	0,67	0,05	no	
	15	g/100g	35	75	2025-09-15	0,7				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
L-Valine (Amino Acids)	1	g/100g	26	84	2025-09-18	1,1	1,09	1,1	0,078	no	
	2	g/100g	17	93	2025-09-17	1,1	1,1	1,1	0,02	no	
	3	g/100g	30	80	2025-09-04	1,06	1,05	1,08	0,00029	no	
	5	g/100g	32	78	2025-09-26	1,07	1,1	1,04		no	
	6	g/100g	90	20	2025-09-12	1,05	1,04	1,06	0,00080	no	100
	7	g/100g	46	64	2025-09-11	1,03	1,01	1,04			
	8	g/100g	1.024	1.036		1,03	1,02	1,04	0,01	no	
	9	g/100g	41	69	2025-09-29	0,98	1,01	0,95		no	
	10	g/100g	22	88	2025-10-23	0,98	0,97	1			
	11	g/100g	38	72	2025-09-25	1,07	1,07	1,07	0,1	no	
	12	g/100g	10	10	2025-09-25	0,01	0,01	0,01	0.00132	no	
	13	g/100g	02	108	2025-09-26	1,01	1	1,01	0,01	no	
	14	g/100g	12	98	2025-09-09	1	1	1	0,05	no	
	15	g/100g	35	75	2025-09-15	1,03				yes	

Parameter	Participant	Unit	Sample I DLA No.	Sample II DLA No.	Date of analysis	Final Result (Mean)	Result Sample I	Result Sample II	LOQ (Lim it of quantifica- tion)	Recovery included	Recovery rate
					Day/Month					yes / no	in %
Taurine (Amino Acids)	1	g/100g	26	84	2025-09-18	0,23	0,24	0,24	0,078	no	
	2	g/100g	17	93	2025-09-17				0,02		
	3	g/100g	30	80	2025-09-04						
	5	g/100g	32	78	2025-09-26	0,73	0,71	0,74		no	
	6	g/100g	90	20	2025-09-12		LOQ	LOQ	0,0061	no	100
	7	g/100g	46	64	2025-09-11	0,03	0,03	0,03			
	8	g/100g	0.030	0.030		0,03	0,03	0,03	0,01	no	
	9	g/100g	41	69	2025-09-29	0,03	0,03	0,03		no	
	10	g/100g	22	88	2025-10-23	0,03	0,03	0,03			
	11	g/100g	38	72	2025-09-25	0,03	0,03	0,03	0,01	no	
	12	g/100g	10	10	2025-09-25	0,03	0,03	0,03	0.006	no	
	13	g/100g	02	108	2025-09-26	0,04	0,04	0,04	0,01	no	
	14	g/100g	12	98	2025-09-09	0,03	0,03	0,03	0,02	no	
	15	g/100g	35	75	2025-09-15	392				yes	

5.1.2 Analytical Methods

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Alanine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylcylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				yes	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15					no		

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Arginine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylcylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Aspartic acid (Amino Acids)	1	ASU L 49.07-1 1985-05				yes / no	yes / no	
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylcylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Cystine (Amino Acids)	1							
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylcylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9					no		
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
Sum L-Cysteine / L-Cystin (Amino Acids)	1							
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6							not examined
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	no	
	13							
	14							
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Cystine (Amino Acids)	1							
Sum L-Cysteine / L-Cystin (Amino Acids)	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
L-Cystine (Amino Acids)	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
Sum L-Cysteine / L-Cystin (Amino Acids)	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
L-Cystine (Amino Acids)	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
L-Cystine (Amino Acids)	7							
L-Cystine (Amino Acids)	8							
Sum L-Cysteine / L-Cystin (Amino Acids)	9	ASU L 49.07-1:1985-05				yes	yes	
L-Cystine (Amino Acids)	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
L-Cystine (Amino Acids)	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
L-Cystine (Amino Acids)	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
L-Cystine (Amino Acids)	13	internal method HPLC-UV				no	no	
L-Cystine (Amino Acids)	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
L-Cystine (Amino Acids)	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Glutamine (Amino Acids)	1							
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylcylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6							not examined
	7							
	8							
	9					no	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	no	
	13	internal method HPLC-UV				no	no	
	14							
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Glutaminc acid (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylcylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6							not examined
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
Glycine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AM101	Extraktion mit 5-Sulfosilylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Histidine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Isoleucine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Leucine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method accredited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Lysine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method ^{ac} credited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Methionine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Phenylalanine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method ^{ac-} credited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Proline (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method ^{ac-} credited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Serine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method ^{ac-} credited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Threonine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method ^{ac} -credited ISO/IEC 17025 yes / no	Further Remarks
L-Tryptophan (Amino Acids)	1							
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6							not examined
	7							
	8							
	9					no	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	Verdünnungslösung	HPLC-FID	3-Pkt.-Kalibrierung, Futtermittel		yes	
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	no	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, F, konsolidierte Fassung : 2024-04 (mod.)					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix	Method ^{ac} -credited ISO/IEC 17025	Further Remarks
						yes / no	yes / no	
L-Tyrosine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method accredited ISO/IEC 17025 yes / no	Further Remarks
L-Valine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfoisovaleriansäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	in HCl gelöst	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	E: 0,65 g, 1:2
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,1 g/50ml				yes	
	12		extracted with 0.1N HCl	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	yes	
	14	VO (EG) 152/2009, III, E, konsolidierte Fassung : 2024-04					yes	
	15							

Parameter	Participant	Method description as in test report / norm / literature	Sample preparation	Measuring method	Calibration / Reference material	Recovery rate with same matrix yes / no	Method ^{ac} -credited ISO/IEC 17025 yes / no	Further Remarks
Taurine (Amino Acids)	1	ASU L 49.07-1 1985-05						
	2	PALC19:2021-02 (HPLC/FLD after derivatization)		The method has been adapted from Waters "AccQ Tag Instruction manual".	The AA-18 Sigma Standard was used to prepare the 4 level calibration.		yes	no recovery rate was determined
	3	PV 32-AMI01	Extraktion mit 5-Sulfosilylsäure-lösung, Carrez-Klärung	Aminosäureanalysator mit Nachsäulenderivatisierung	externe Kalibration		yes	
	5	acid extraction, in house-method		HPLC-FLD after derivatisation				
	6	Method based on technical regulation BVL F0007 (EG) "Bestimmung des Gehaltes an Aminosäuren in Futtermitteln"		ion chromatography with post-column derivatisation	Calibration with standardsolution c = 200 nmol/ml	no	no	
	7							
	8							
	9	ASU L 49.07-1:1985-05				yes	yes	
	10	freie AS (DV 2024/771 zur Änderung der VO 152/2009)	Loading Puffer	Aminosäureanalysator	1-Pkt.-Kalibrierung, Futtermittel		yes	
	11	ASU § 64 L 49.07 2	Einwaage ca. 0,4 g/50ml				yes	
	12		extracted with water and removed protein and fat with Carrez	Derivative with AQC		no	yes	
	13	internal method HPLC-UV				no	no	
	14	Hausmethode					yes	
	15							

5.2 Homogeneity

5.2.1 Microtracer homogeneity test of final PT-samples

Microtracer Homogeneity Test

DLA ptSU10 (2025)

Weight whole sample	1,20	kg
Microtracer	FSS-rot lake	
Particle size	75 – 300	µm
Weight per particle	2,0	µg
Addition of tracer	27,6	mg/kg

Result of analysis

Sample	Weight [g]	Particle number	Particles [mg/kg]
1	5,03	55	21,9
13	5,07	60	23,7
25	5,12	52	20,3
37	5,10	59	23,1
49	5,03	61	24,3
61	5,01	60	24,0
73	5,06	62	24,5
85	5,11	53	20,7
97	5,06	53	20,9
109	5,07	55	21,7

Poisson distribution

Number of samples	10	
Degree of freedom	9	
Mean	57,0	Particles
Standard deviation	3,99	Particles
χ^2 (CHI-Square)	2,51	
Probability	98	%
Recovery rate	82	%

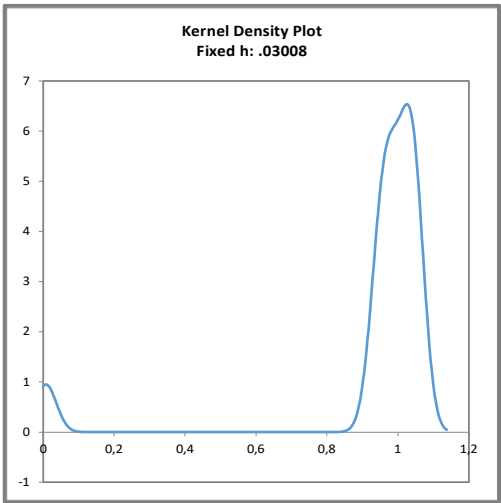
Normal distribution

Number of samples	10	
Mean	22,5	mg/kg
Standard deviation	1,57	mg/kg
rel. Standard deviation	7,0	%
Horwitz standard deviation	10,0	%
HorRat-value	0,70	
Recovery rate	82	%

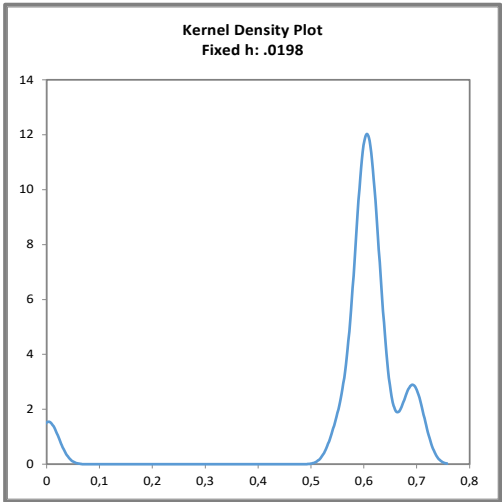
5.3 Kernel Density Plots of Results

Figures:
Kernel density plots
of participants' results
(with $h = 0,75 \times \sigma_{pt}$ of X_{pt})

L-Aspartic Acid



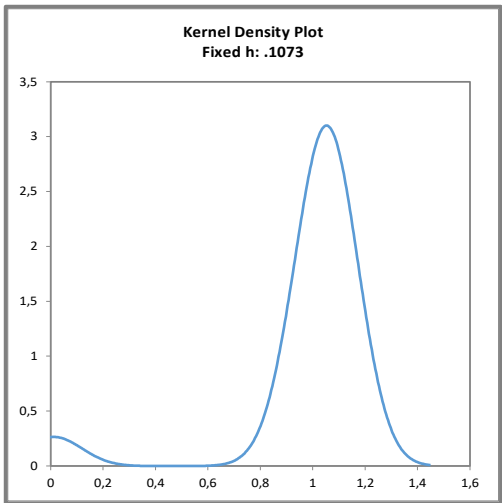
L-Alanine



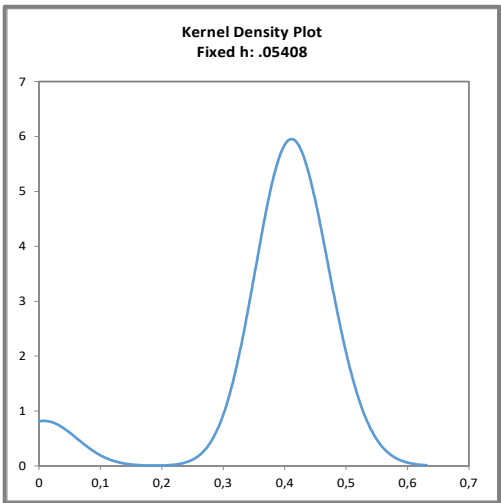
L-Cysteine

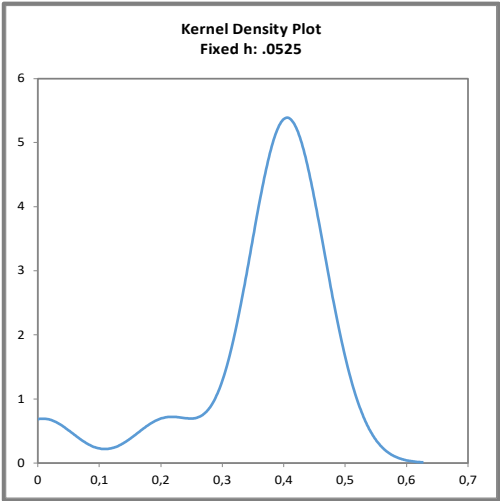
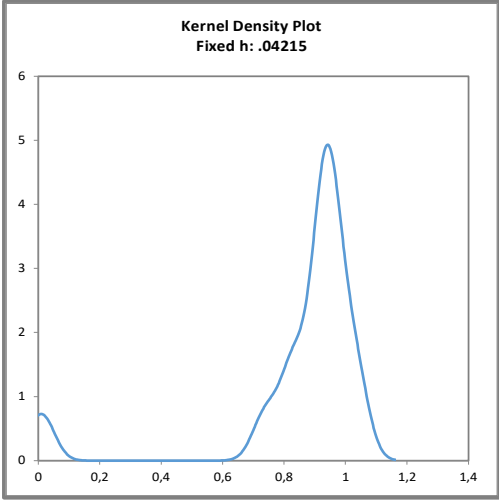
no results

L-Arginine



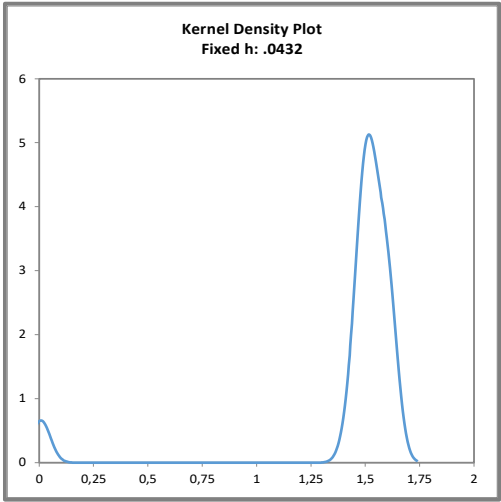
L-Cystine



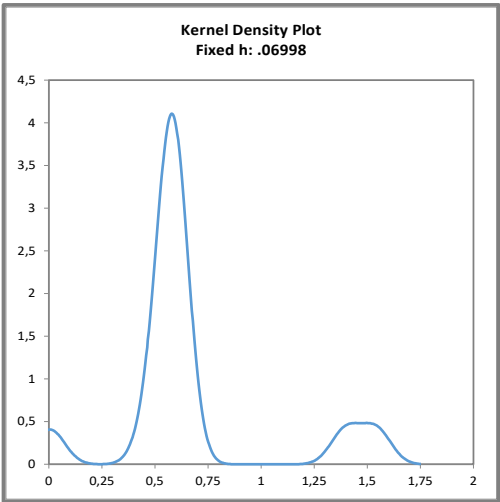
Figures: Kernel density plots of participants' results (with $h = 0,75 \times \sigma_{pt}$ of X_{pt})	L-Glutamine < 8 results
Sum of L-Cysteine and L-Cystine < 8 results	L-Glutamic Acid < 8 results
Sum of L-Cystine  The plot shows a bimodal distribution with a small peak at 0 and a larger peak at approximately 0.4. The x-axis ranges from 0 to 0.7, and the y-axis ranges from 0 to 6.	L-Glycine  The plot shows a unimodal distribution with a sharp peak at approximately 0.95. The x-axis ranges from 0 to 1.4, and the y-axis ranges from 0 to 6.

Figures:
Kernel density plots
of participants' results
(with $h = 0,75 \times \sigma_{pt}$ of X_{pt})

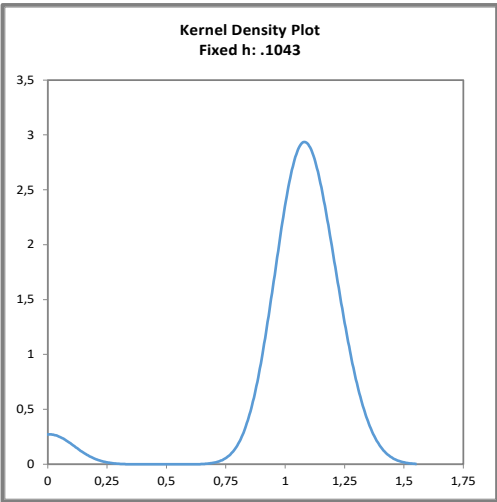
L-Leucine



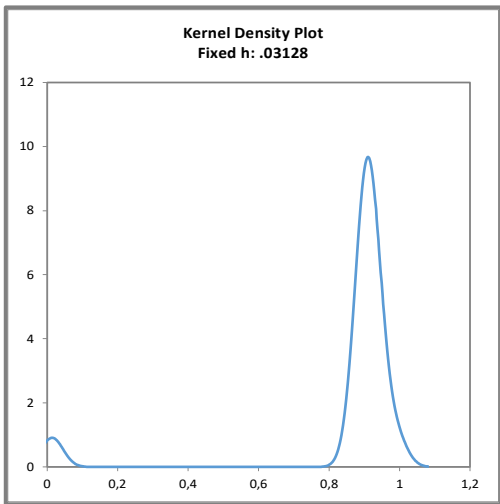
L-Histidine



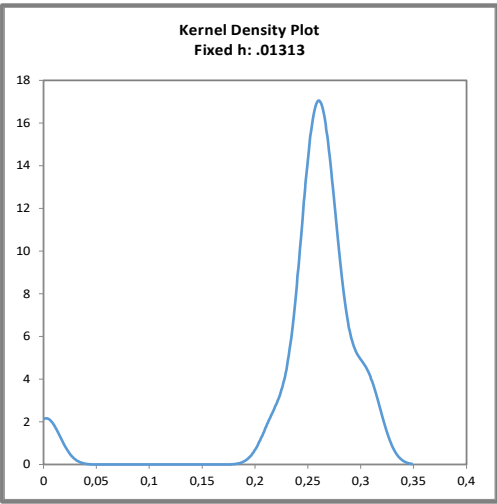
L-Lysine



L-Isoleucine



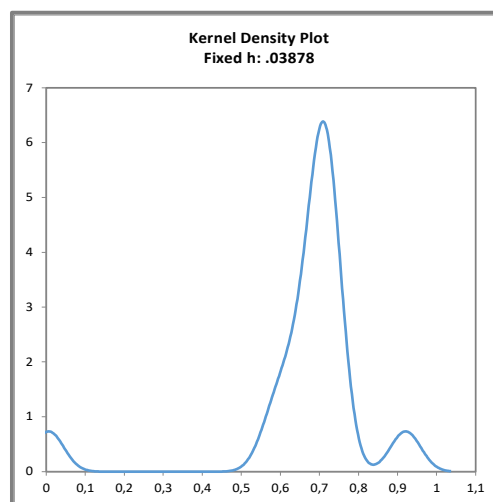
L-Methionine



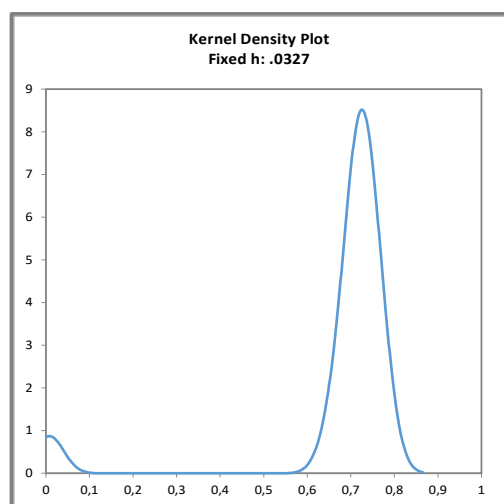
Figures:

Kernel density plots
of participants' results
(with $h = 0,75 \times \sigma_{pt}$ of X_{pt})

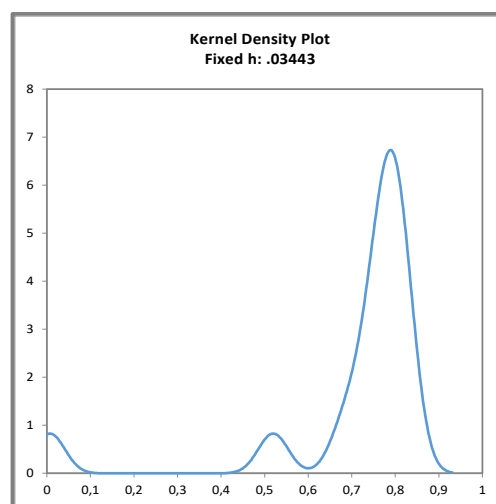
L-Serine



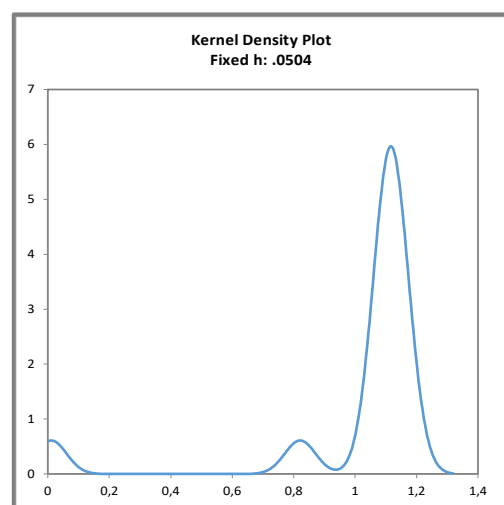
L-Phenylalanine



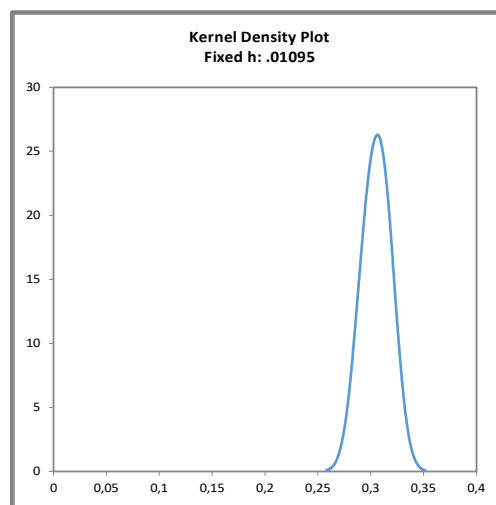
L-Threonine



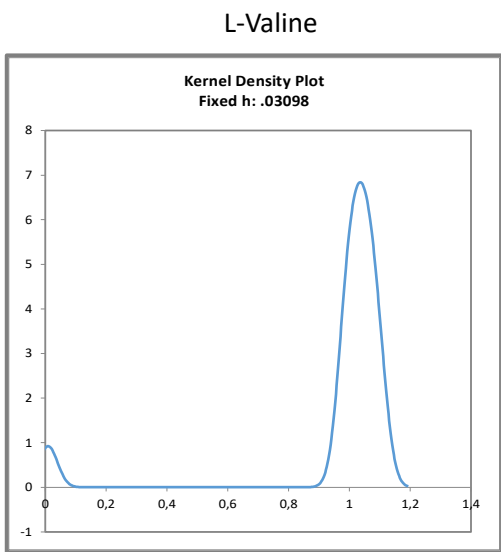
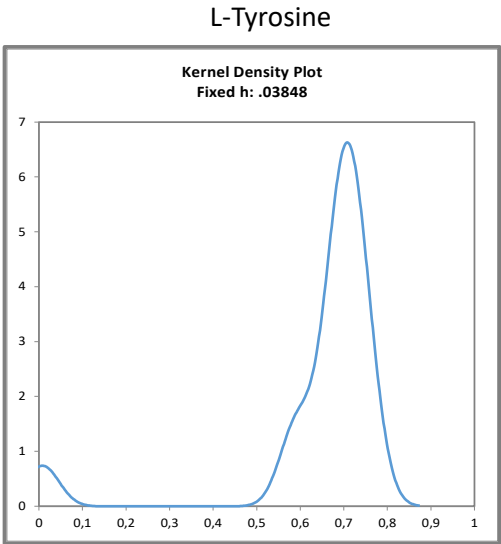
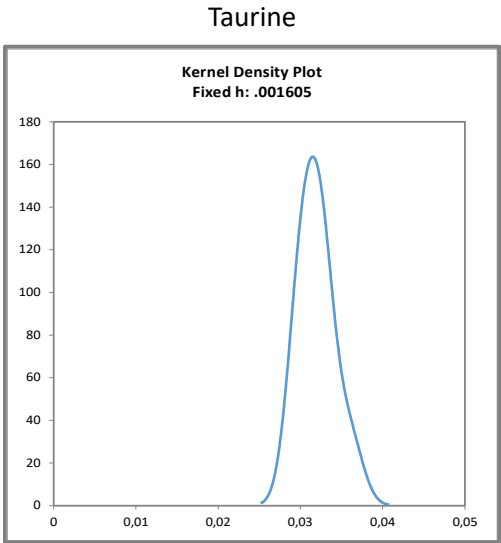
L-Proline



L-Tryptophan



Figures:
Kernel density plots
of participants' results
(with $h = 0,75 \times \sigma_{pt}$ of X_{pt})



5.4 Information on the Proficiency Test (PT)

Before the PT, the participants received the following information in the sample cover letter:

PT number	DLA ptSU10 (2025)
PT name	Free Amino Acids and Taurine in Food (Infant Food)
Sample matrix*	Samples I + II: Infant food (balanced dietetic food, powder for preparation of infant milk) / ingredients: Glucose syrup, vegetable oils, amino acids, vitamins, minerals and other food additives; Protein equivalent content <20%
Number of samples and sample amount	2 identical samples I + II, 10 g each.
Storage	Samples I + II: room temperature (PT period), cooled 2 - 10°C (long term)
Intentional use	Laboratory use only (quality control samples)
Parameter	quantitative: diverse free amino acids and taurine (see Results submission / data entry table)
Methods of analysis	Analytical methods are optional
Notes to analysis	The analysis of PT samples should be performed like a routine laboratory analysis. In general we recommend to homogenize a representative sample amount before analysis according to good laboratory practice, especially in case of low sample weights.
Result table	The results for sample I and II as well as the final results calculated as mean of the double determination (samples I and II) should be filled in the result submission file. The recovery rates, if carried out, has to be included in the calculation.
Units	g/100g
Number of significant digits	at least 2
Further information	For information please specify: – Date of analysis – DLA-sample-numbers (for sample I and II) – Limit of detection – Assignment incl. Recovery – Recovery with the same matrix – Method is accredited
Result submission	online via my DLA participant's portal (https://my.dla-pt.com) you will receive further information about the access by e-mail
Last Deadline	the latest <u>October 2025-10-03</u>
Evaluation report	The evaluation report is expected to be completed 6 weeks after deadline of result submission and will be provided as a PDF file in the DLA Participant Portal (https://my.dla-pt.com/).
Coordinator and contact person of PT	Matthias Besler-Scharf PhD

* Control of mixture homogeneity and qualitative testings are carried out by DLA. Any testing of the content, homogeneity and stability of PT parameters is subcontracted by DLA.

6. Index of participant laboratories in alphabetical order

Participant	Town	Country
		DE
		DE
		DE
		DE
		DE
		DE
		DE
		DE
		DE
		DE
		DE
		DE
		GB
		IT
		NL
		VN

[The address data of the participants were deleted for publication of the evaluation report.]

7. Index of references

The list of **references no. 1-21** can be found in the
“**DLA Evaluation Guide 02.02 (2024) General Proficiency Test Schemes**”.

Additional specific references:

- A) ASU §64 LFGB L 49.07-1 Bestimmung der Aminosäuren in Aminosäurengemischen (1985) [Determination of amino acids in amino acid mixtures]
- B) ASU §64 LFGB L 49.07-2 Bestimmung der Aminosäuren in diätetischen Lebensmitteln auf Basis von Proteinhydrolysaten (1986) [Determination of amino acids in dietetic foods on the basis of protein hydrolysates]
- C) ASU §64 LFGB L 49.07-3 Bestimmung des Tryptophangehaltes in diätetischen Lebensmitteln auf Basis von Proteinhydrolysaten (1989) [Determination of tryptophan in dietetic foods on the basis of protein hydrolysates]
- D) Verordnung 152/2009/EG zur Festlegung der Probenahmeverfahren und Analysemethoden für die amtliche Untersuchung von Futtermitteln / Regulation 152/2009/EC laying down the methods of sampling and analysis for the official control of feed