University of Stuttgart
Germany

# Analytische Qualitätssicherung Baden-Württemberg

## Proficiency Test 5/16
## TW S2 – pharmaceuticals in drinking water

## sulfadiazine, sulfadimidine, sulfamethoxazole, sulfaethoxypyridazine, sulfamerazine, sulfathiazole sulfadoxine, sulfamethoxypyridazine, sulfachloropyridazine, sulfadimethoxine, trimethoprime

provided by
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and
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AQS Baden-Württemberg

IWW

Stuttgart, in December 2016

Responsibilities:

| | |
|---|---|
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## LIST OF CONTENTS

# General

This PT was provided by AQS Baden-Württemberg in cooperation with IWW Water Center in Mülheim an der Ruhr and with the network “NORMAN” (Network of reference laboratories for monitoring of emerging environmental pollutants). In this round sulfadiazine, sulfadimidine, sulfamethoxazole, sulfaethoxypyridazine, sulfamerazine, sulfathiazole, sulfadoxine, sulfamethoxypyridazine, sulfachloropyridazine, sulfadimethoxine and trimethoprime were to be determined.

The PT was executed and evaluated according to the requirements of DIN 38402-A45 and ISO/TS 20612.

# PT design

Each participant received the following samples:

- 3 samples for the determination of above mentioned parameters in 1000-ml-ground bottles. The samples were preserved by adding 40 mg/l sodium azide. The samples also contained acetonitrile as solubility promoter.

3 different concentration levels/batches were produced. All participants received the same samples.

# Sample preparation

The samples for the determination of the pharmaceuticals were based on a real ground water matrix from the northern part of the region Ruhr in North Rhine-Westphalia. The ground water was used without treatment for the sample preparation.

The ground water was spiked with stock solutions and the concentrations covered drinking and ground water relevant ranges.

# Sample distribution

The samples were dispatched on 11 October 2016 by express service.

## Analytical methods

The participants were free to choose a suitable method, but following limits of quantification were required:

| Parameter | limit of quantification |
|---|---|
| • sulfadiazine | 0.05 µg/l |
| • sulfadimidine | 0.05 µg/l |
| • sulfamethoxazole | 0.05 µg/l |
| • sulfaethoxypyridazine | 0.05 µg/l |
| • sulfamerazine | 0.05 µg/l |
| • sulfathiazole | 0.05 µg/l |
| • sulfadoxine | 0.05 µg/l |
| • sulfamethoxypyridazine | 0.05 µg/l |
| • sulfachloropyridazine | 0.05 µg/l |
| • sulfadimethoxine | 0.05 µg/l |
| • trimethoprime | 0.05 µg/l |

The samples had to be analysed in duplicate over the complete method (sample preparation and measurement). The participants were asked to report the results as average values in µg/l with three significant digits.

## Submission of results

The deadline for the submission of results was on 07 November 2016.

## Evaluation procedure

The statistical evaluation was executed according to DIN 38402-A45 and ISO TS 20612 “Interlaboratory comparisons for proficiency testing of analytical chemistry laboratories”. From the participants’ results a relative standard deviation was calculated for each concentration level and parameter using the Q-method. The reference values (see chapter “Traceable reference values”) were used as assigned values $x_{pt}$. The standard deviation resulting from the Q-method was used as $\sigma_{pt}$.

$\sigma_{pt}$ was limited as follows:

- lower limit: 5%
- upper limit: 25%

A z-score was calculated for each measurement result derived from the assigned value $x_{pt}$ and the standard deviation for proficiency assessment $\sigma_{pt}$:

$$z-\mathrm{Score}=\frac{\left(x-x_{pt}\right)}{\rho_{pt}}$$

The z-score was modified to a $z_U$-score with a correction factor for proficiency assessment (as described in the standards mentioned above).
The tolerance limit was defined as $|z_U|=2.0$.

## Assessment

There was no overall assessment of the proficiency test round, but the single parameters were assessed.
A parameter was assessed as successful, if more than half of the values were correctly determined (2 out of 3 values are within the tolerance limits).

According to ISO 13528 (2015) the single results were assessed as follows:

| | |
|---|---|
| $\lvert z_u \rvert \leq 2.0$ | successful |
| $2.0 < \lvert z_u \rvert < 3.0$ | questionable |
| $\lvert z_u \rvert \geq 3.0$ | unsatisfactory |

Not successful were:

1) Values which were not determined (if the other samples of this parameters were analysed),
2) Values, which were indicated with “lower than limit of quantification”,
3) Values, which were subcontracted,
4) Values, which were submitted after the deadline of submission of results.

## Evaluation

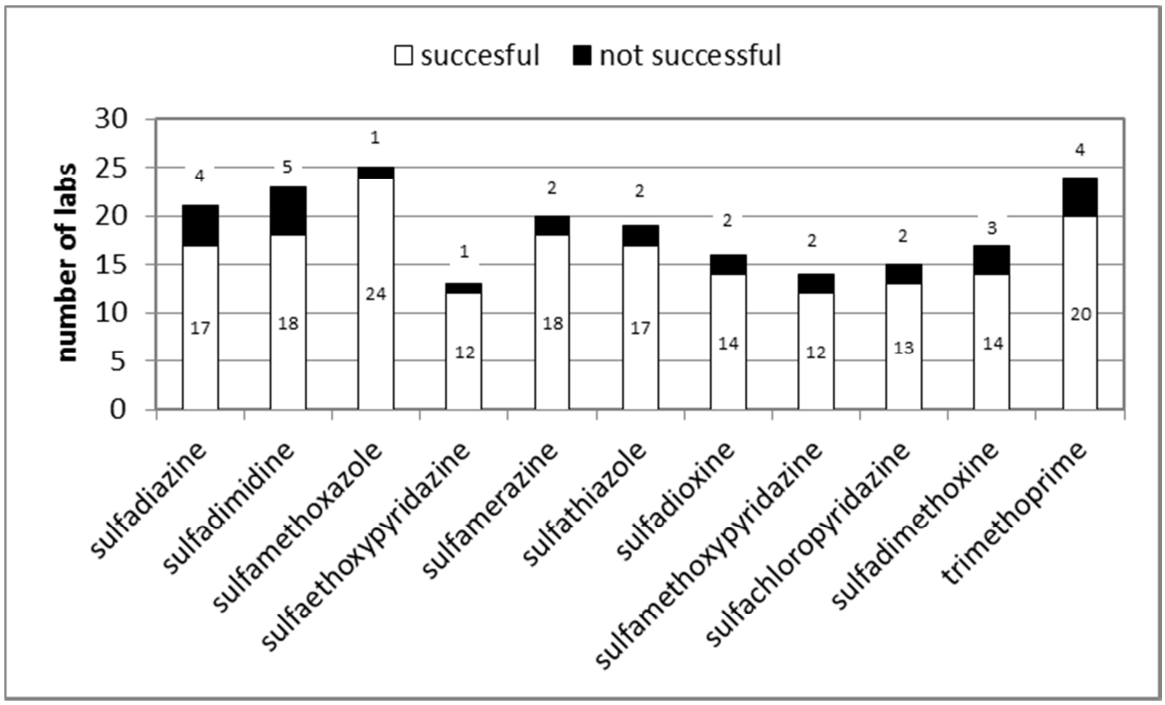
Number of participants: 26

1 laboratory did not report any result.

Number of reported values: 621

Number of accepted values: 544 (87,6%)

In the following figure the successful and not successful laboratories for each parameter are illustrated.



# Explanation of Appendix A

Appendix A contains for each parameter

- parameter tables
- a figure of participants' means versus the spiked amounts for the determination of the recovery rate
- a figure of the relative standard deviations versus the concentrations
- a figure of the tolerance limits in the PT versus the concentrations
- the frequency of application of analytical methods
- the method specific evaluation
- a comparison of mean and reference values for each concentration level
- a comparison of the relative standard deviations of the different methods
- the statistical characteristics of the method specific evaluation
- a tabular comparison of the means with the reference values and their uncertainties

### Parameter tables

In these tables the following values for each concentration level are listed:

- assigned value
- expanded uncertainty of the assigned value in %, calculated from an uncertainty budget (see chapter "Traceable reference values")
- standard deviation, calculated using robust statistical method
- standard deviation for proficiency assessment for the calculation of $z_U$-scores
- rel. standard deviation for proficiency assessment
- tolerance limits above and below
- permitted deviations above and below in %
- number of values in this level
- number of not satisfactory values below and above the assigned value and the percentage of these values in total.

### Determination of recovery rate

In the diagrams of the assigned values versus the spiked amount of analyte a linear regression line was calculated using a generalized least square regression which takes into account the uncertainties of the values in both directions. From these values the recovery rate for each parameter was determined (see diagrams). The slope of the line indicates the average recovery rate. The diagrams also contain the expanded uncertainty (k=2) of the concentrations from the spike and the assigned values.

### Relative standard deviations and tolerance limits

The diagrams for the relative standard deviation vs. the assigned value show the concentration dependency of the standard deviation and the tolerance limits in percent. The relative standard deviations calculated from participants' data are the stars connected by an interrupted line, the rel. standard deviation taken from the variance function (and sometimes limited by the upper or lower limit) are given by squares, connected by a continuous line.

### Method specific evaluation

For each parameter the methods used by the participants are shown in a diagram. In a second diagram for each method with a frequency of more than 5 %, values are sorted in 5 categories:

| | |
|---|---|
| too low | results with $z_U$-score < -2 |
| low | results with –2 ≤ $z_U$-score < –1 |
| correct | results with –1 ≤ $z_U$-score ≤ +1 |
| high | results with +1 < $z_U$-score ≤ +2 |
| too high | results with $z_U$-score > +2 |

**Comparison of means and reference values for each concentration level**

Finally the mean value calculated from all results, the reference value (see chapter Traceable reference values) are compared with mean values calculated for all methods separately. All mean values were calculated using the Hampel estimator described in ISO/TS 20612. Mean values were calculated only, if more than 8 results were within a z-score-range of ± 2. The means are reported with their expanded uncertainty, calculated according to ISO 13528.
All mean values and their expanded uncertainties are additionally compared with the reference values and their expanded uncertainties.

# Explanation of Appendix B

Participants were asked to report expanded uncertainties of their results on a voluntary basis. In this diagram for each parameter the reported uncertainties for all concentration levels with the reproducibility standard deviation (horizontal line) are displayed. Values which deviate from the reproducibility standard deviation with a factor more than 2 are usually not realistic.

# Explanation of Appendix C

In the last part of the report, for all concentration levels the results of all participants are illustrated. Confidentiality of participants is ensured by using lab codes. The lab codes were sent to participants with the certificates.
In detail Appendix C contains:

- a table with all data
- figures with
  - all reported results
  - all $z_U$-scores
  - all reported expanded uncertainties
  - all ζ–scores

**Table with all data**

The assigned value with the expanded uncertainty and the tolerance limits for the concentration level is illustrated in the table. For each participant the following data are given:

- lab code
- reported result
- measurement uncertainty of the value (if reported)
- ζ-score for this value, calculated with the following formula

$$\zeta = \frac{x - x_{pt}}{\sqrt{u_{lab}^2 + u_{x_{pt}}^2}}$$ , with

$x - x_{pt}$ = difference from the measured value and the assigned value

- $u_{lab}$ = standard uncertainty of the value, reported by the participant
- $u_{x_{pt}}$ = standard uncertainty of the assigned value

- $z_U$-score for proficiency assessment
- assessment of the value according to its z-score

Meaning of ζ-scores:
The assessment of ζ-scores is similar to that of $z_U$-scores. If the data are normally distributed and the uncertainties are well estimated, ζ-scores will lie between -2 and +2 with a probability of around 95 %.
ζ-scores are mainly influenced by the measurement uncertainties reported by the laboratory. Therefore ζ-scores are usually not appropriate for the assessment of the reported results, unless the reported measurement uncertainty is checked for fitness-for-purpose.
Therefore we do not use the ζ-scores for the assessment of the laboratories.
Nevertheless ζ-scores are appropriate to check the plausibility of the reported measurement uncertainty:
If the $z_U$-score of a result is within the tolerance limit and the ζ-score is outside, then the measurement uncertainty is underestimated.
If the $z_U$-score is outside the tolerance limits and the absolute value of the ζ-score is lower than two, then the requirements of the proficiency test were stronger compared with the reported measurement uncertainty.

Diagrams of uncertainty data
In the first figure for all lab codes the measurement uncertainty (together with the reproducibility standard deviation) is illustrated. The second figure shows the associated ζ-scores.

## Measurement uncertainty

10 (40%) out of 25 laboratories with valid values reported measurement uncertainties. In total 231 (37.2%) out of 621 valid values were given with the measurement uncertainty. The following table displays the number of values with measurement uncertainty against the accreditation status.

| Accreditation status of the values | Number of values | Number of values with measurement uncertainty |
|---|---|---|
| accredited | 339 | 192 (56.6%) |
| not accredited | 66 | 33 (50%) |
| not specified | 216 | 6 (2.8%) |

We would like to put emphasis on the fact that reporting of measurement uncertainties in our PT scheme is absolutely voluntary. The only objective is to help all participants to reasonably handle measurement uncertainties and their estimation.
The diagrams show that the spread of reported uncertainties in some cases is vast, from unrealistic low values up to very high. A plausibility check using reproducibility standard deviations of the PT round could be helpful here.
If measurement uncertainties are underestimated values assessed as “satisfactory” in the PT ($|z_U| \leq 2$), will have a large ζ-score. $|\zeta| > 2$ means that the “own” requirements (defined in terms of estimated uncertainty) are not fulfilled.
27 (13.9%) of the 194 values reported with uncertainties and having a $z_U$-score $|z_U| \leq 2.0$ had a ζ-score > 2.0. This means that the requirements of the PT scheme have been fulfilled , but not the “own” requirements, the uncertainty is underestimated.

## Traceable reference values

Traceability of analytical results to national and international references is of increasing importance in all laboratories. This is not easy to realise for chemical analyses and often can only be done by analysing certified reference materials. But availability of these reference materials in the water sector is very limited. Therefore we try to provide reference values for the proficiency test samples, traceable to national and international references.
Since our PT samples without exception are spiked, real water samples, reference values can be calculated from the sum of matrix content and spiked amount of analyte. For both summands traceable values and their uncertainty have to be determined. Thereby we assume that no unrecognised bias resulting from sample preparation and transport is present and that we recognise all uncertainty components.

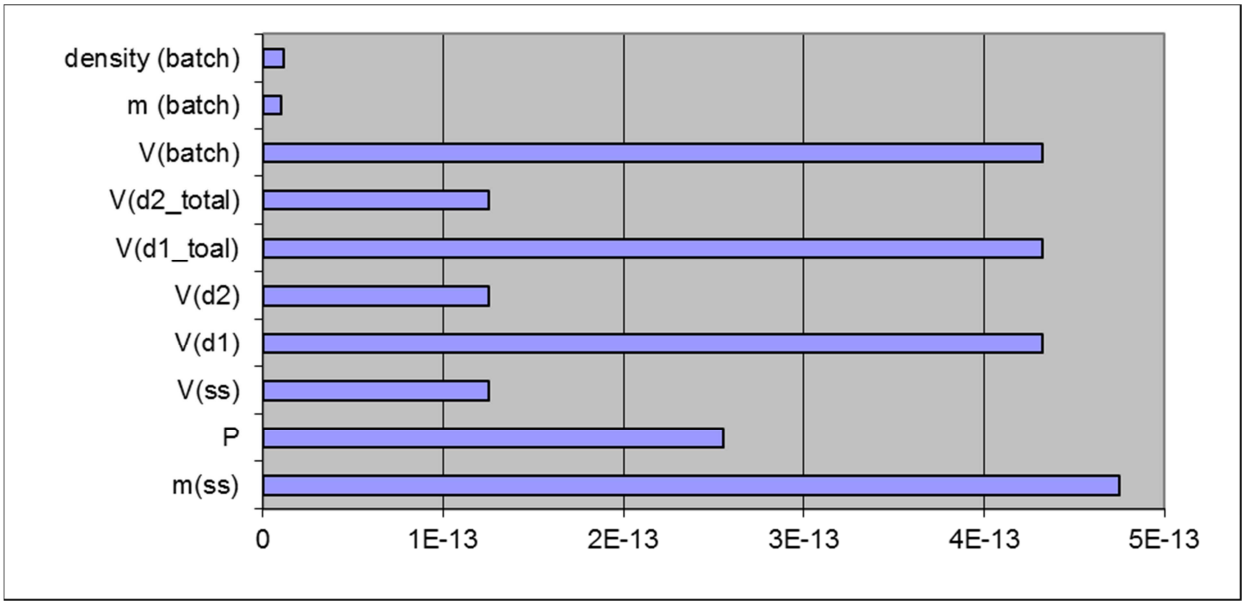
All spiking of samples was controlled gravimetrically and volumetrically. This procedure allows the preparation of a complete uncertainty budget.
The first step is the specification of the measurand with a formula. This shows the links between the result and all influence quantities for the parameter trimethoprime.

$$c_{lot} = \frac{m_{ss} \cdot P \cdot V_{d1} \cdot V_{d2} \cdot V_{lot} \cdot \rho_{lot}}{V_{ss} \cdot V_{d1\_total} \cdot V_{d2\_total} \cdot m_{lot\_total}}$$

with:

| | |
|---|---|
| $c_{lot}$ | concentration of the analyte in the lot resulting from the spike |
| $m_{ss}$ | mass of substance added for preparation of the stock solution |
| $V_{d1}$ | volume of stock solution added into the dilution A |
| $V_{d2}$ | volume of dilution A added into the dilution B |
| $V_{lot}$ | volume of dilution B added into the lot |
| $V_{ss}$ | volume of stock solution |
| $V_{d1\_total}$ | total volume of dilution A |
| $V_{d2\_total}$ | total volume of dilution B |
| $m_{lot\_total}$ | total mass of the lot |
| $\rho_{lot}$ | density of the lot in g/l |
| P | purity of the used substance |

Based on this formula the uncertainty budget can be prepared and all components can be quantified. The following figure shows a typical distribution of the contributions for trimethoprime. The main contributions result from the expanded uncertainty (0,5%), of the purity of the chemical (99,1%) and the pipette steps.




Attention was paid to use a ground water which did not contain any of the analytes. Therefore no matrix content had to be considered and the reference values could be calculated directly from the spikes.

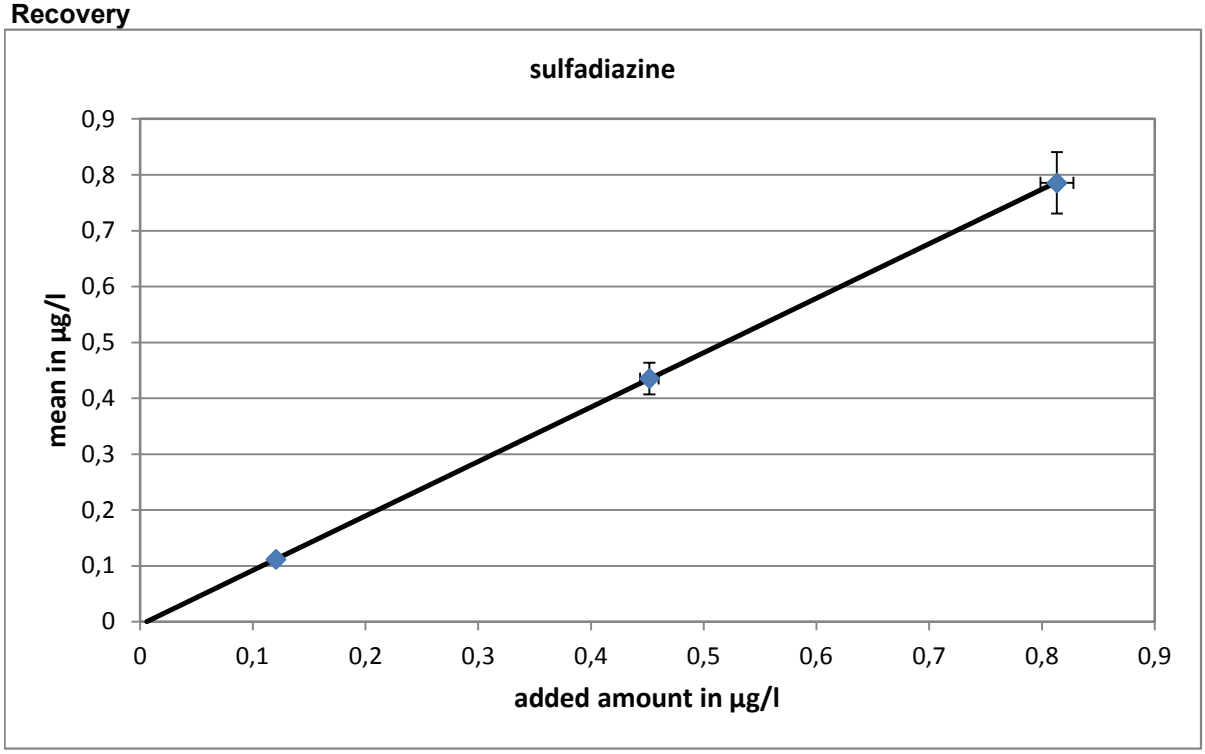
## Internet

The report is available on the following webpage: http://www.aqsbw/pdf/report516.pdf

# sulfadiazine

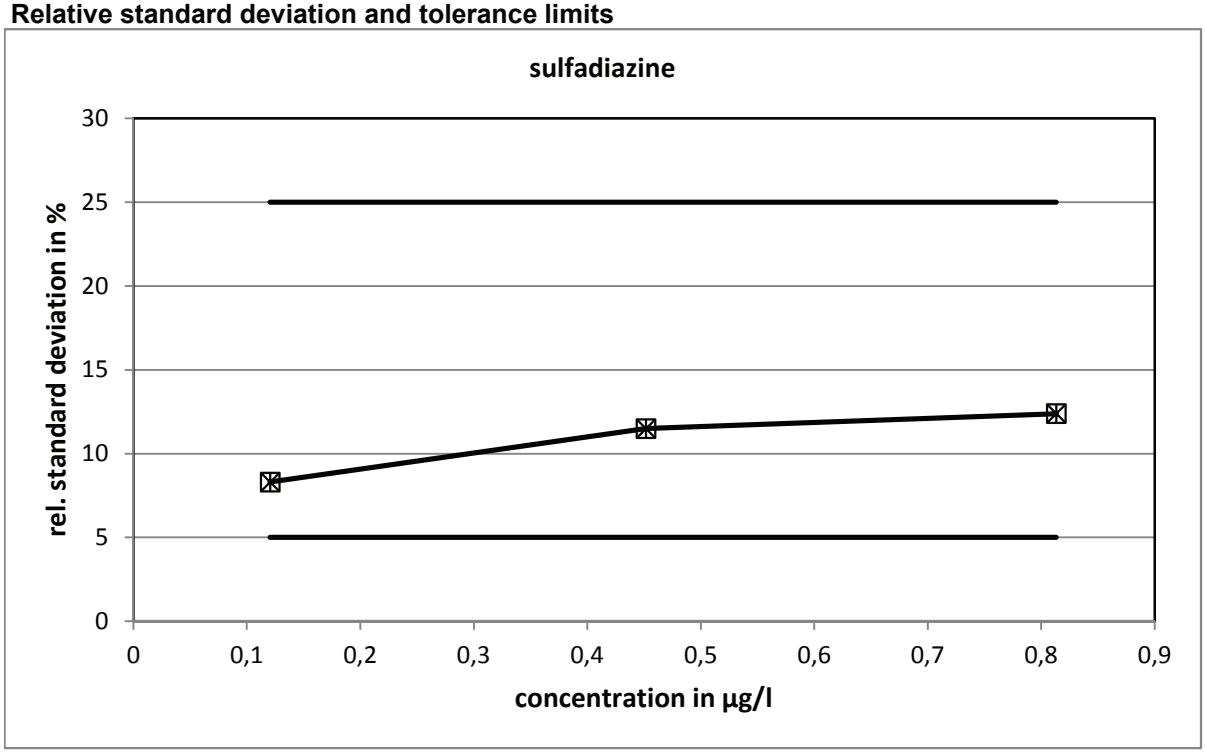
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1205 | 1,80 | 0,0100 | 0,0100 | 8,31 | 0,1415 | 0,1013 | 17,43 | -15,94 | 21 | 1 | 3 | 19,0 |
| 2 | 0,4518 | 1,80 | 0,0519 | 0,0519 | 11,49 | 0,5626 | 0,3534 | 24,53 | -21,77 | 21 | 0 | 4 | 19,0 |
| 3 | 0,8133 | 1,80 | 0,1008 | 0,1008 | 12,39 | 1,029 | 0,6231 | 26,58 | -23,39 | 21 | 1 | 1 | 9,5 |
| | | | | | | | | | sum | 63 | 2 | 8 | 15,9 |

**Recovery**

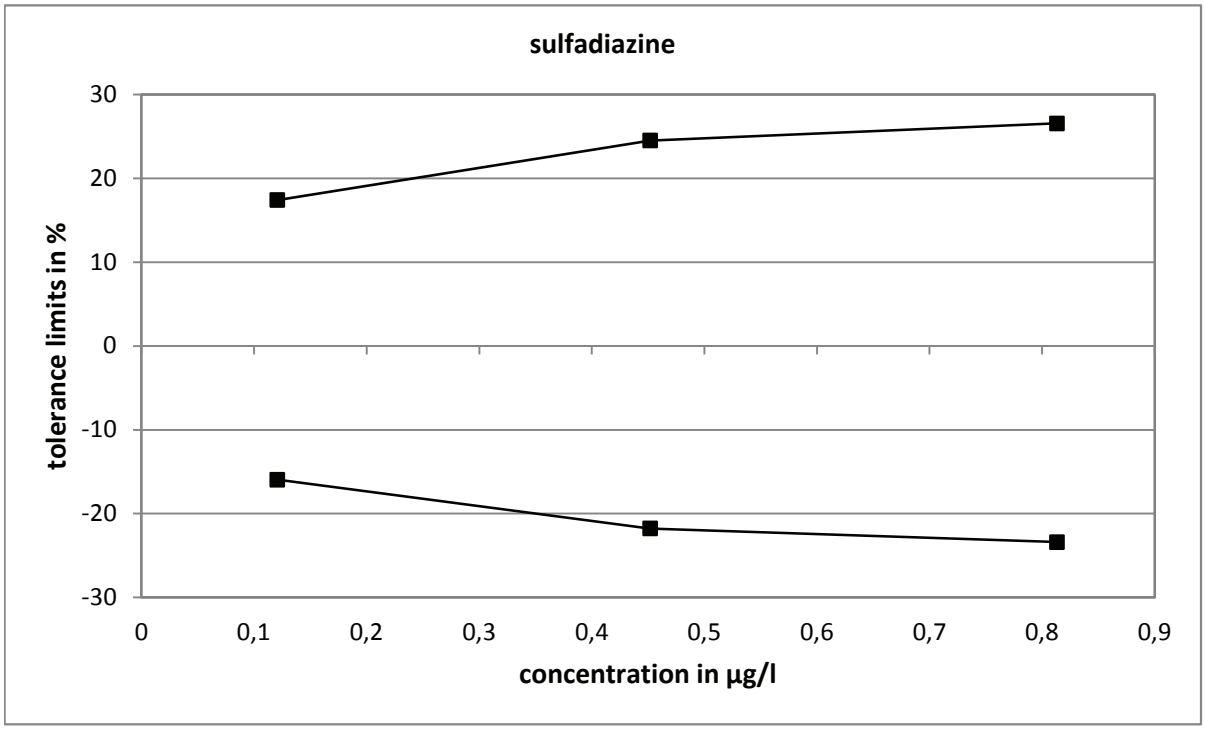



slope of the regression: 0,975
average recovery: 97,5%

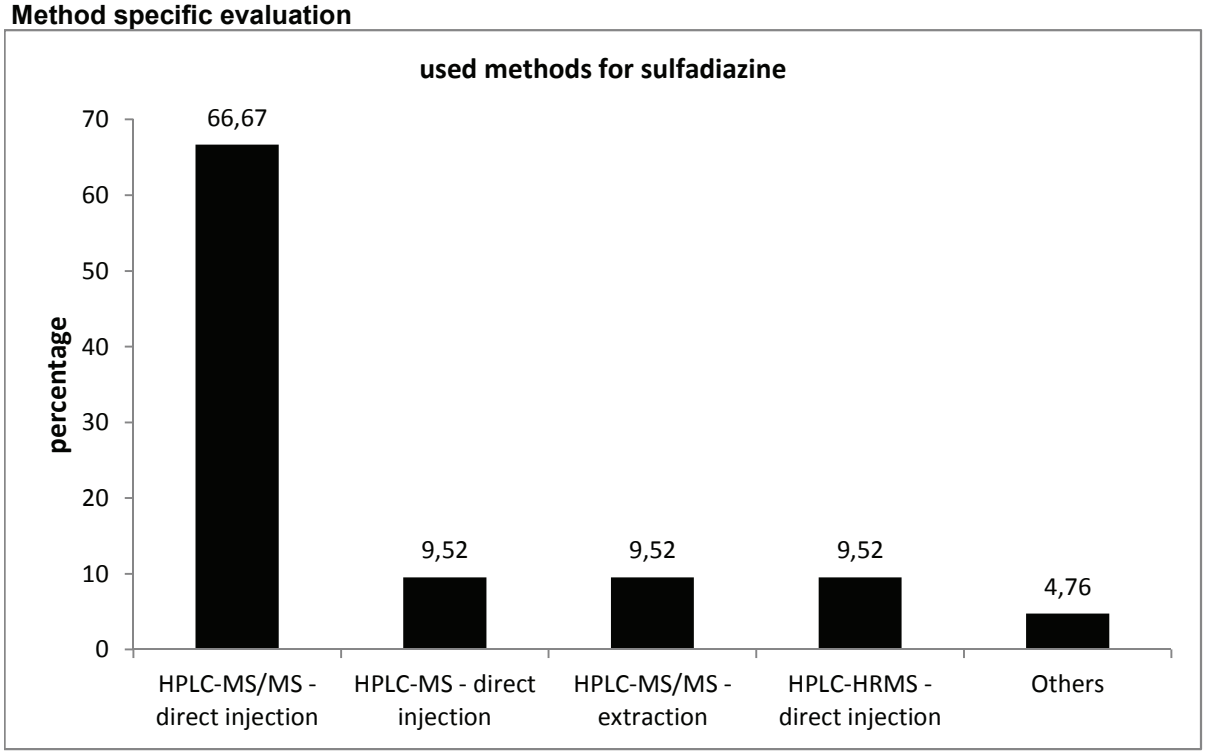
**Relative standard deviation and tolerance limits**

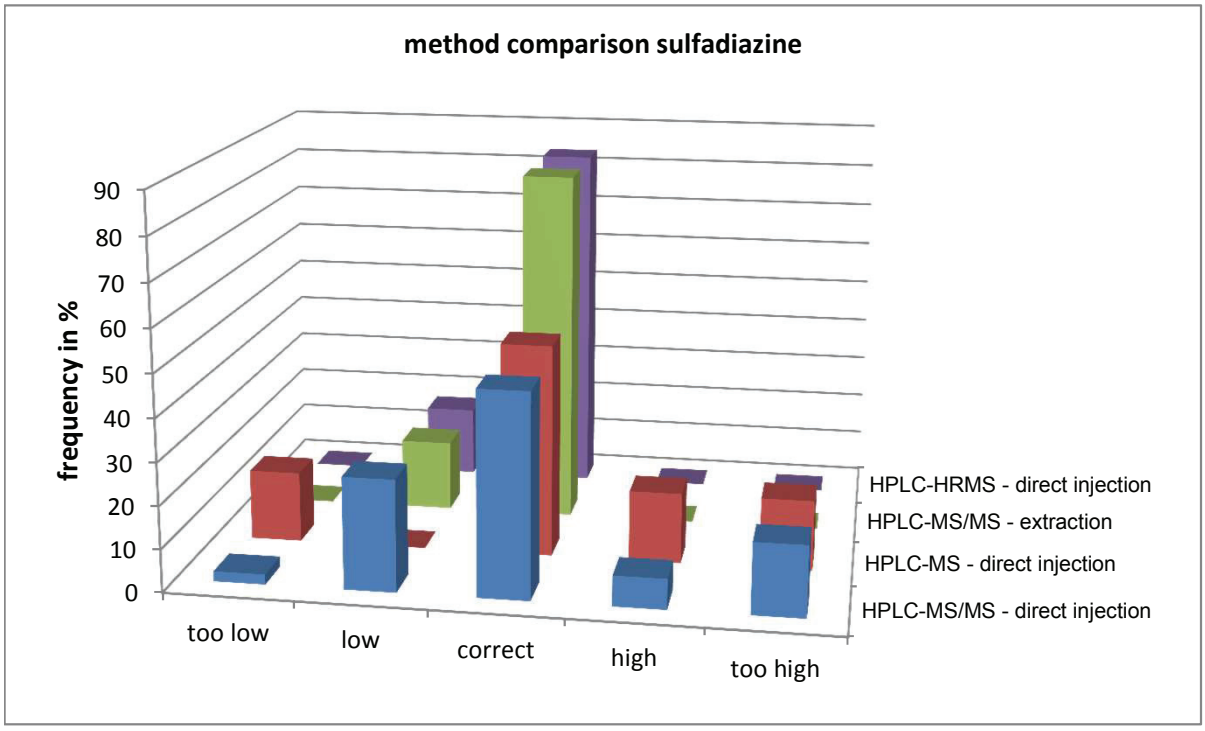



The relative standard deviations, calculated with the Q-method, did not reach the limits.



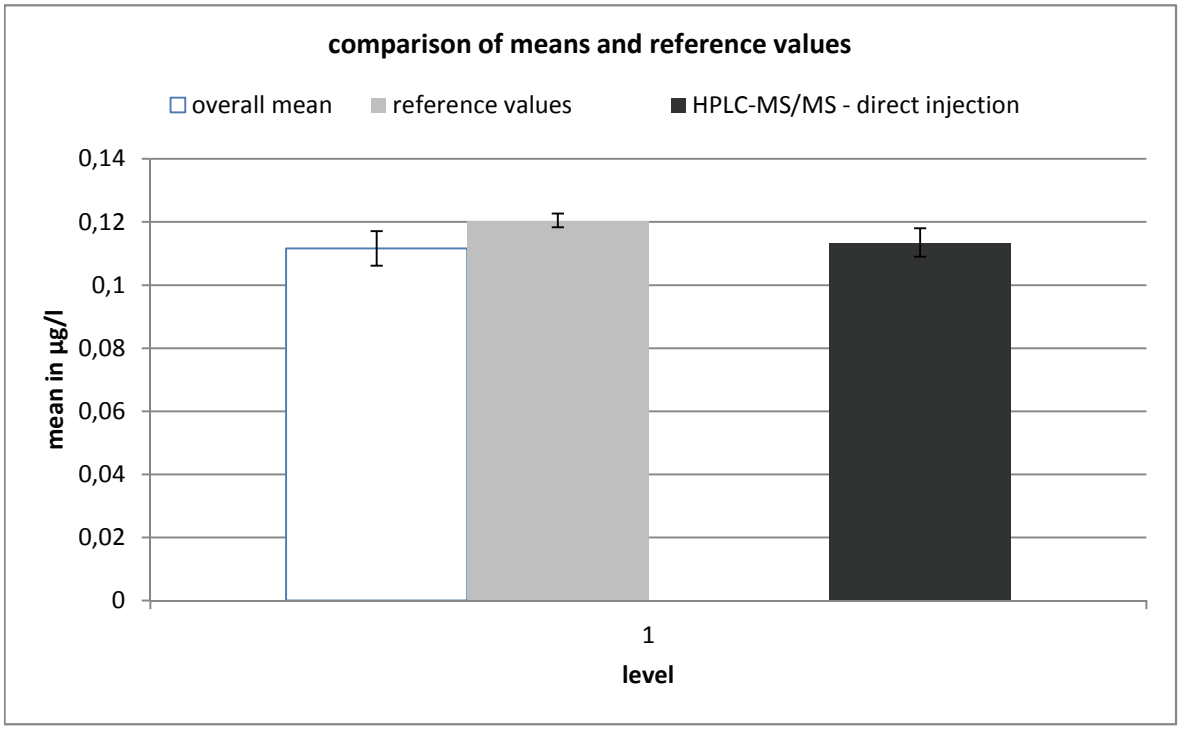
**Method specific evaluation**

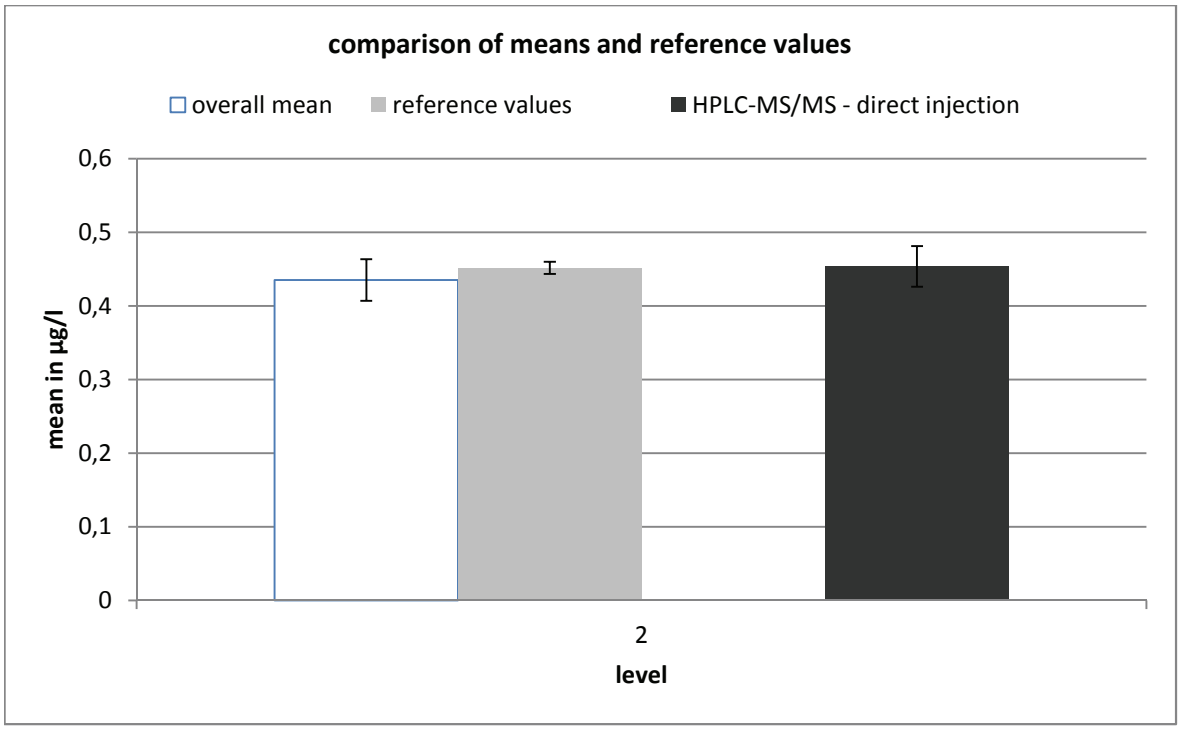


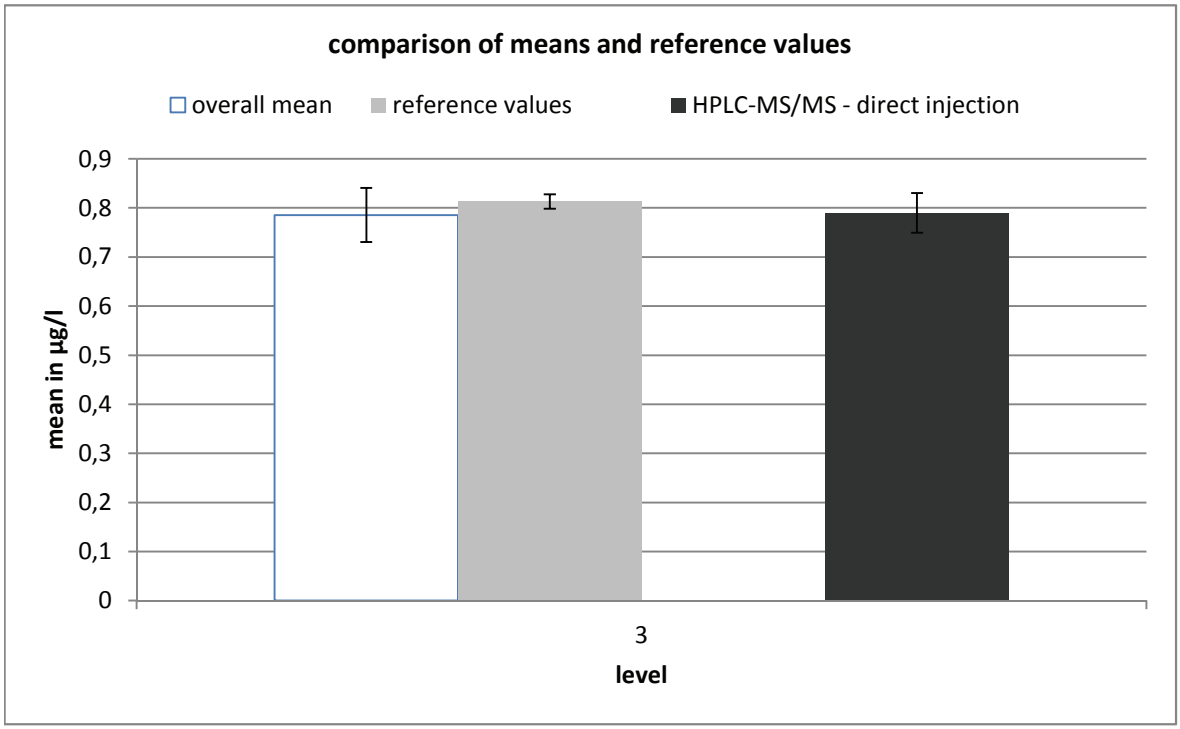



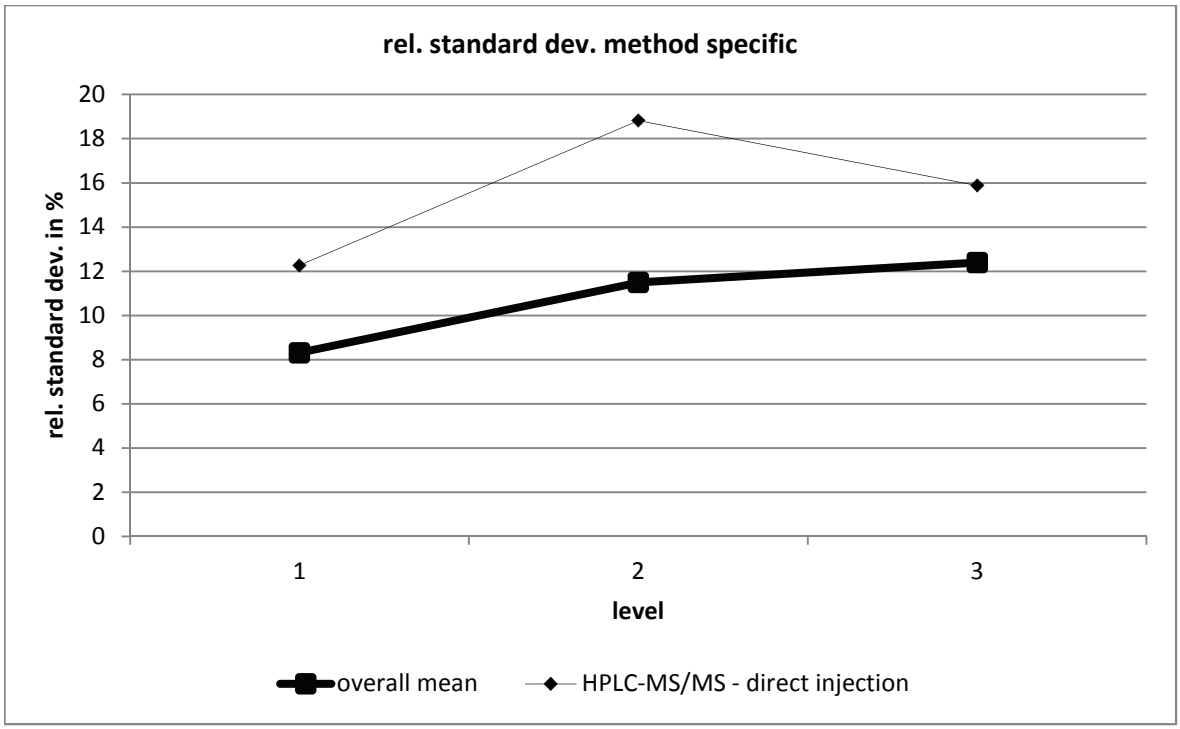
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1116 | 0,0055 | 4,9 | 0,1205 | 0,0022 | 1,8 |
| 2 | 0,4353 | 0,0283 | 6,5 | 0,4518 | 0,0082 | 1,8 |
| 3 | 0,7855 | 0,0550 | 7,0 | 0,8133 | 0,0147 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

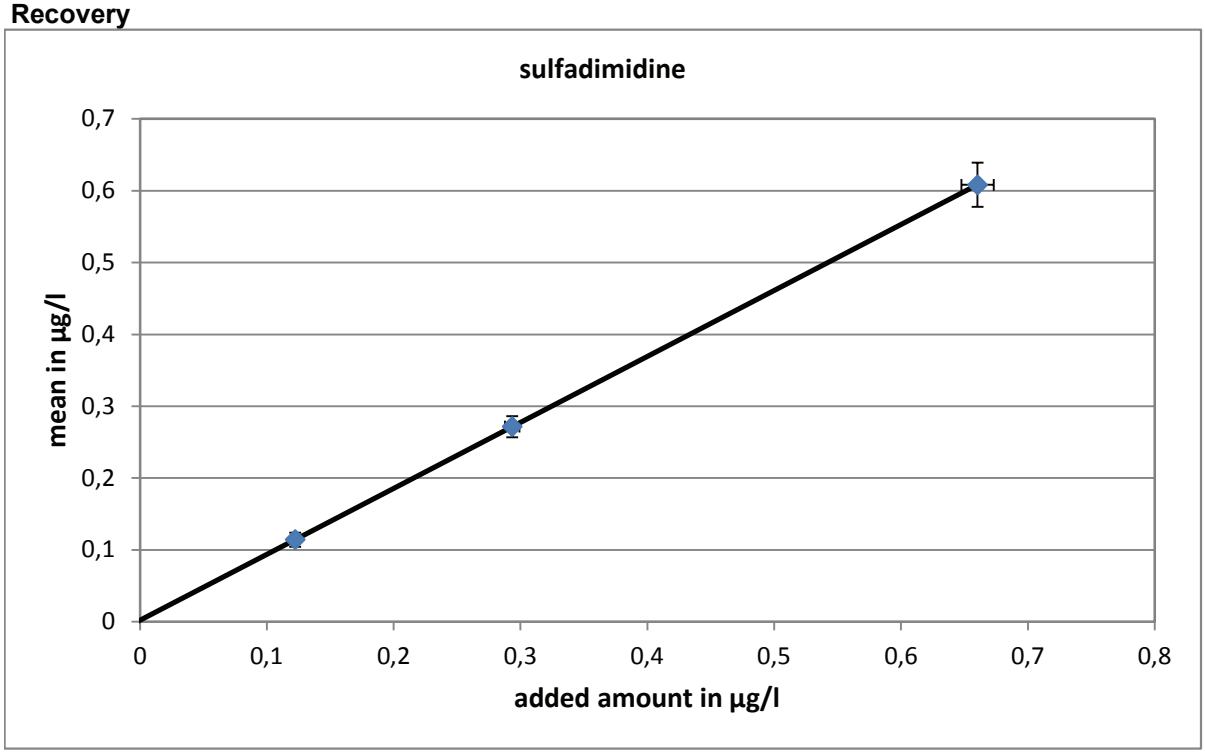



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,113 | 0,004 | 3,958 | 0,014 | 12,26 | 15 | 1 | 3 | 26,67 |
| 2 | 0,454 | 0,028 | 6,075 | 0,085 | 18,82 | 15 | 1 | 1 | 13,33 |
| 3 | 0,79 | 0,04 | 5,124 | 0,125 | 15,88 | 15 | 1 | 1 | 13,33 |

# sulfadimidine

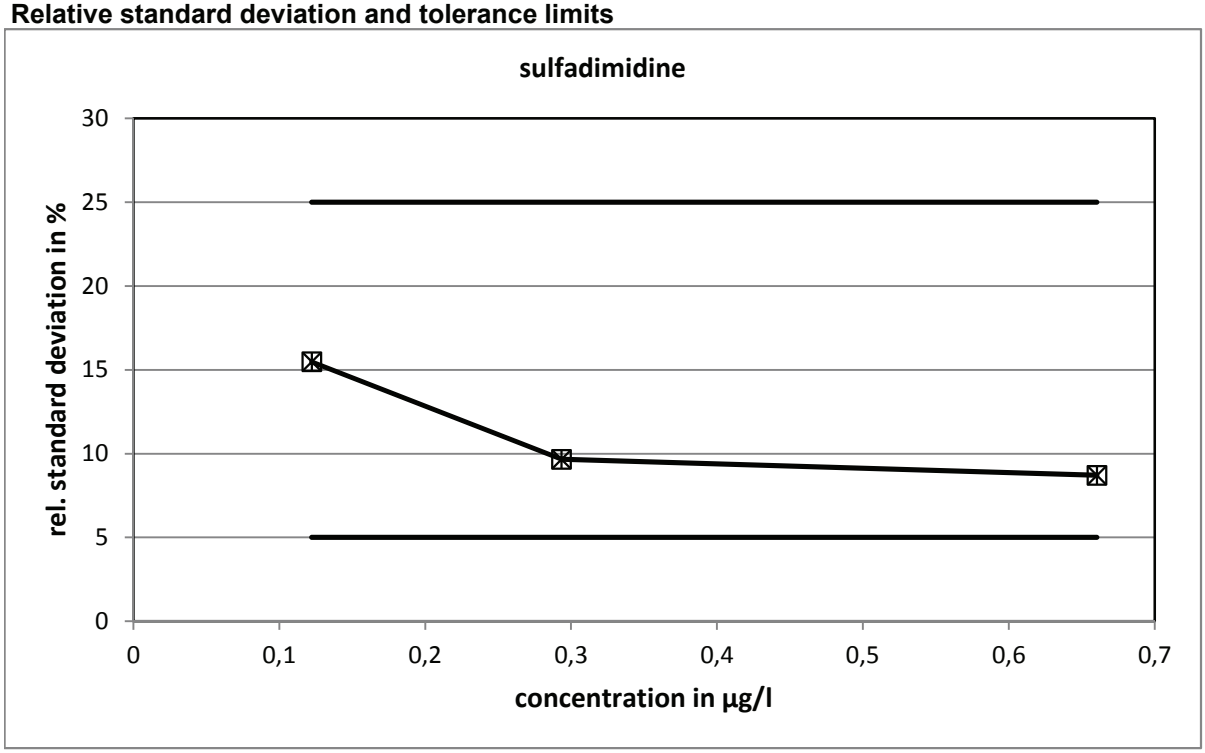
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1223 | 1,88 | 0,0189 | 0,0189 | 15,48 | 0,1638 | 0,0871 | 33,97 | -28,80 | 24 | 0 | 3 | 13,0 |
| 2 | 0,2935 | 1,90 | 0,0284 | 0,0284 | 9,66 | 0,3535 | 0,2394 | 20,44 | -18,42 | 23 | 4 | 2 | 26,1 |
| 3 | 0,6604 | 1,91 | 0,0575 | 0,0575 | 8,71 | 0,7813 | 0,5502 | 18,32 | -16,67 | 22 | 3 | 1 | 17,4 |
| | | | | | | | | | sum | 69 | 7 | 6 | 18,8 |

**Recovery**

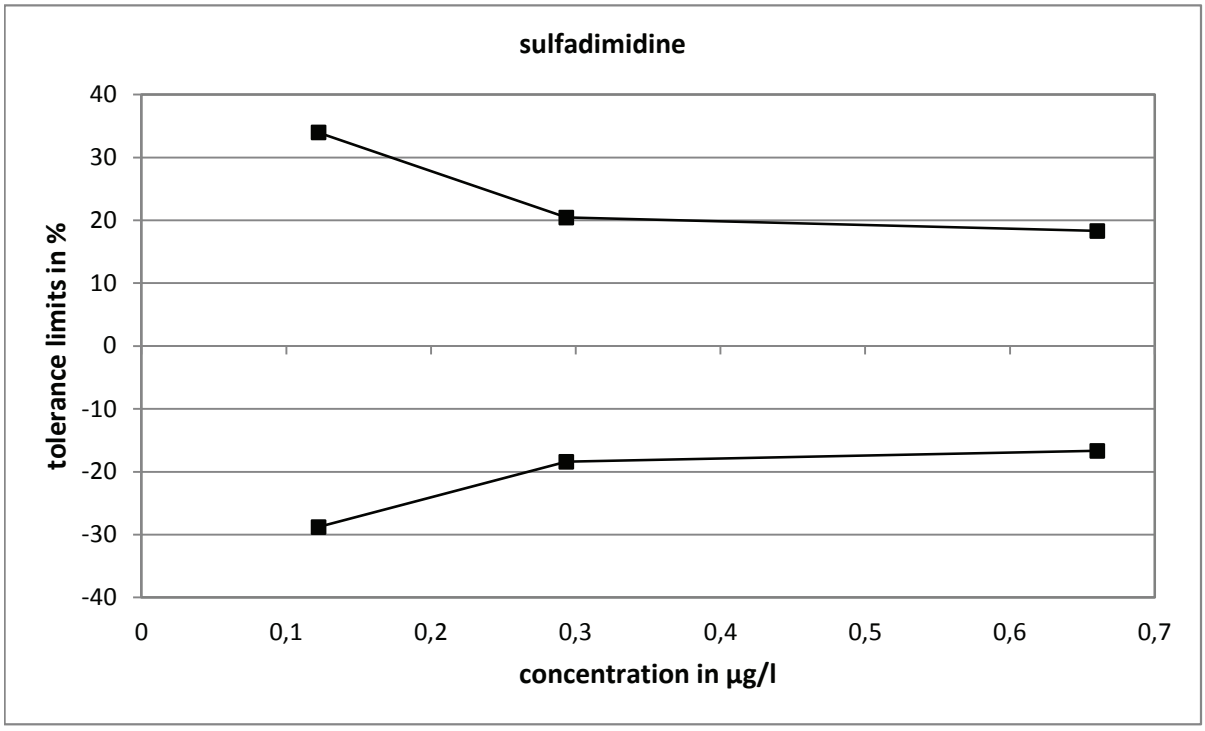



slope of the regression: 0,919
average recovery: 91,9%

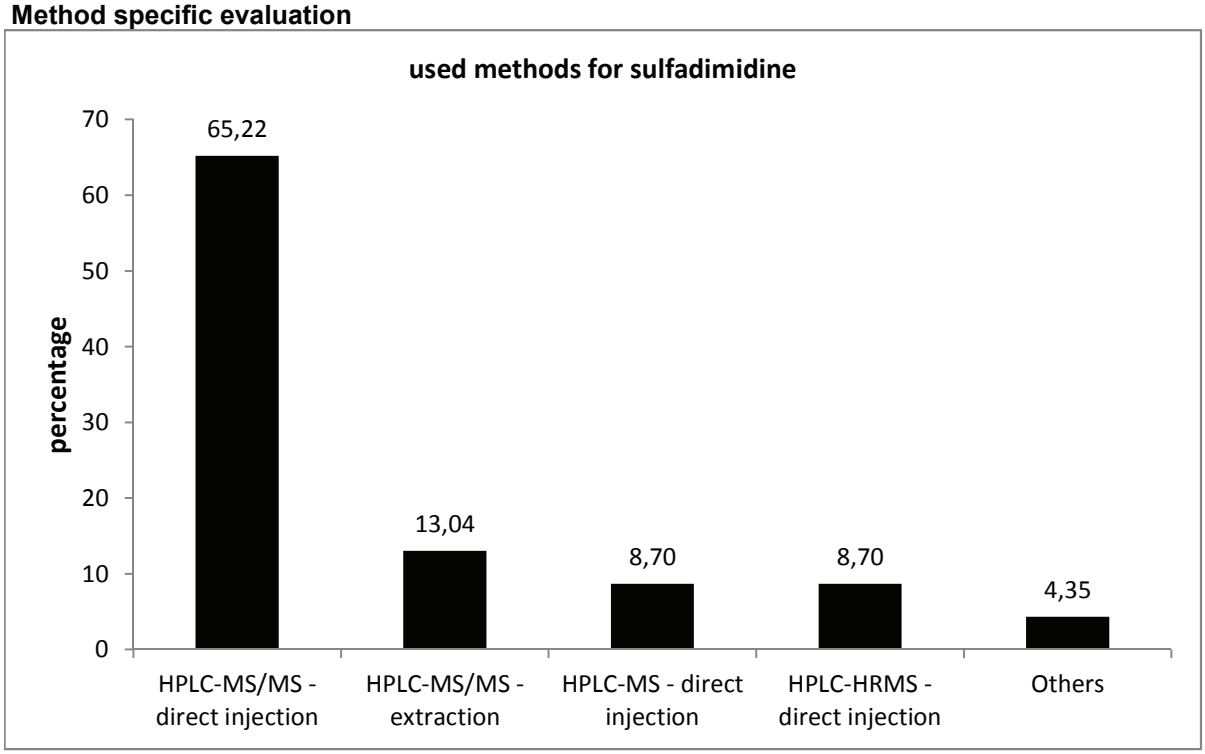
**Relative standard deviation and tolerance limits**

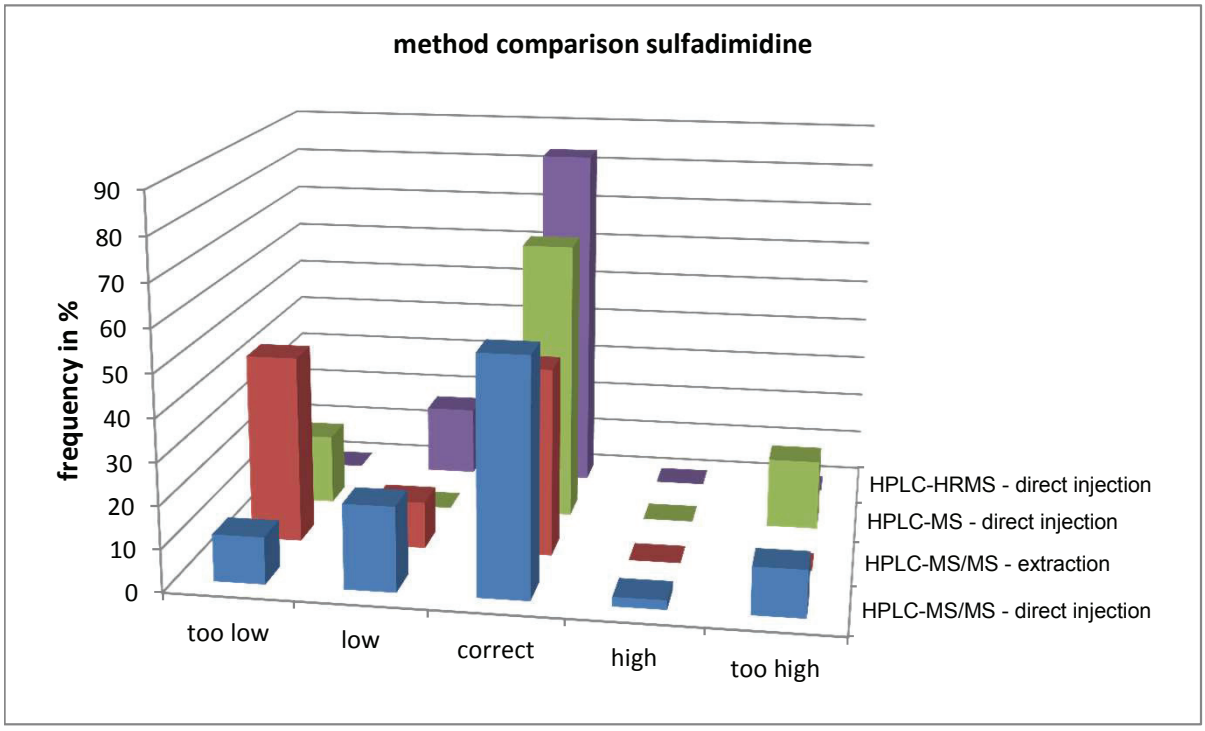



The relative standard deviations, calculated with the Q-method, did not reach the limits.



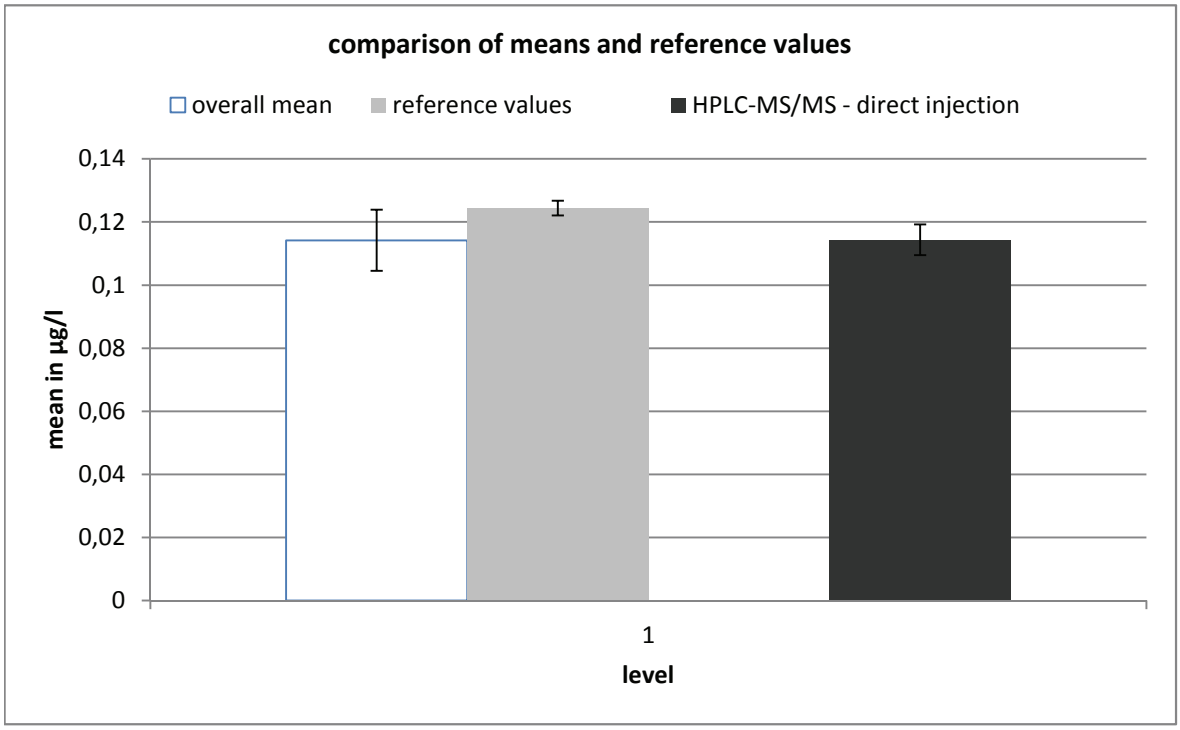
**Method specific evaluation**

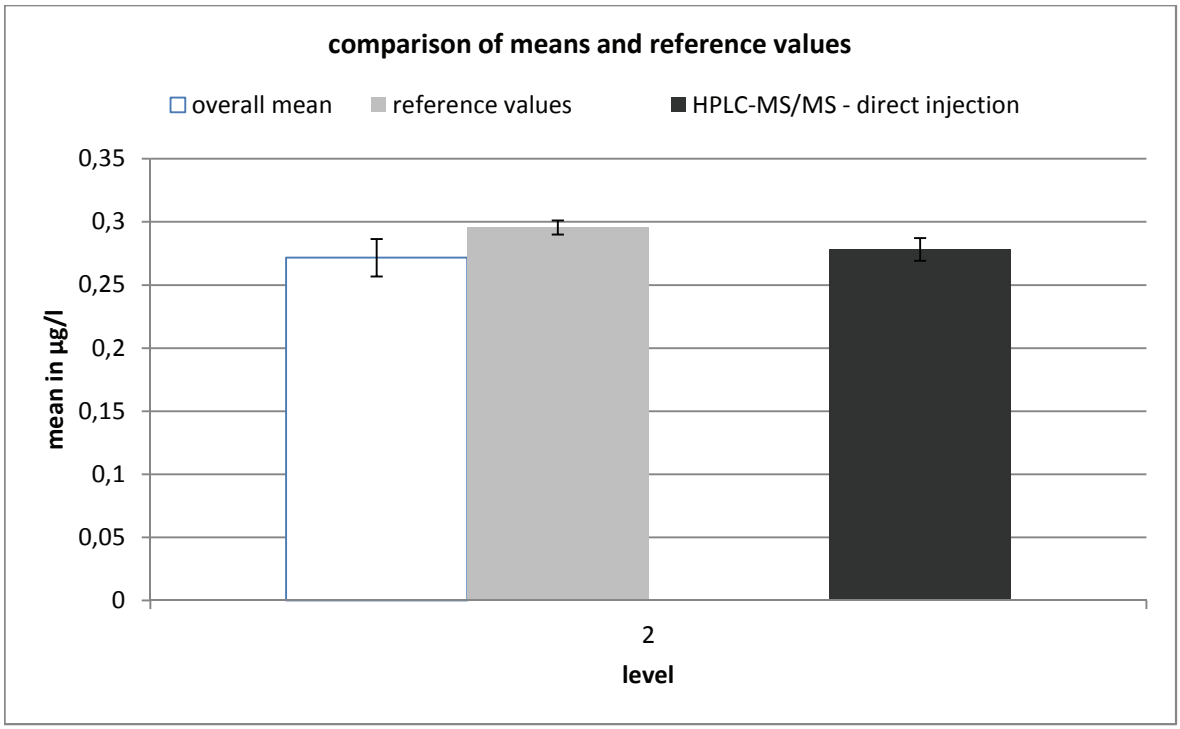


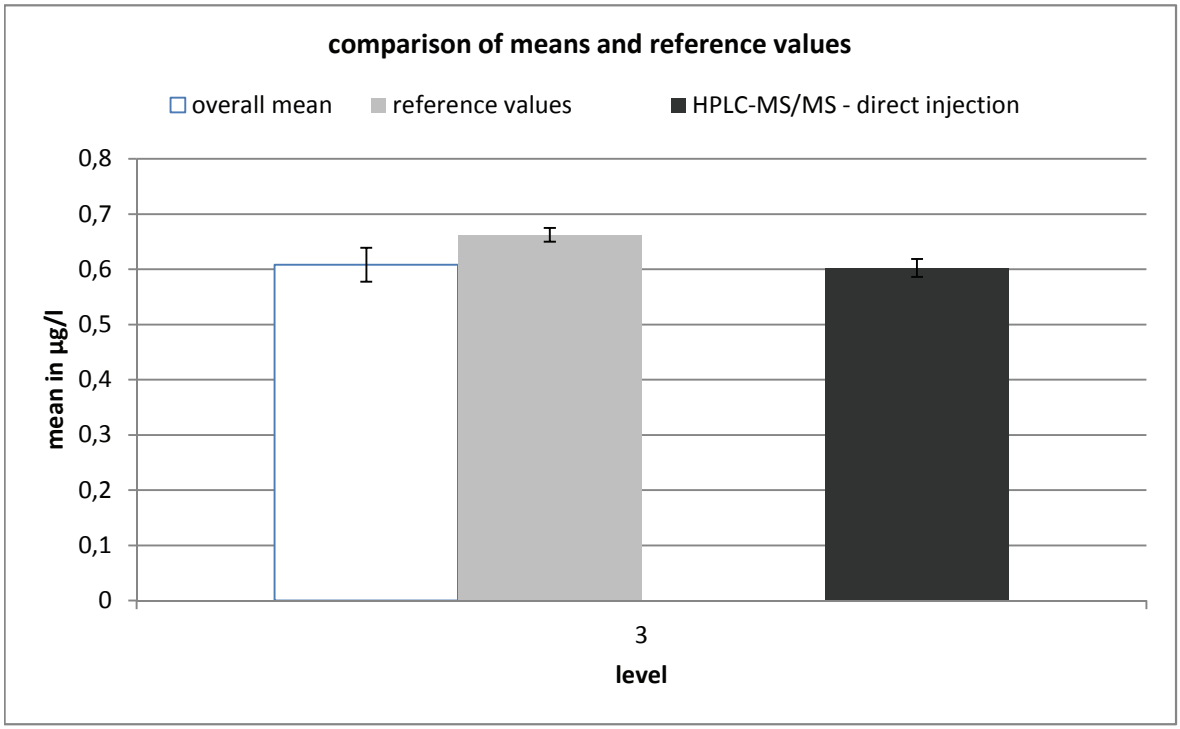



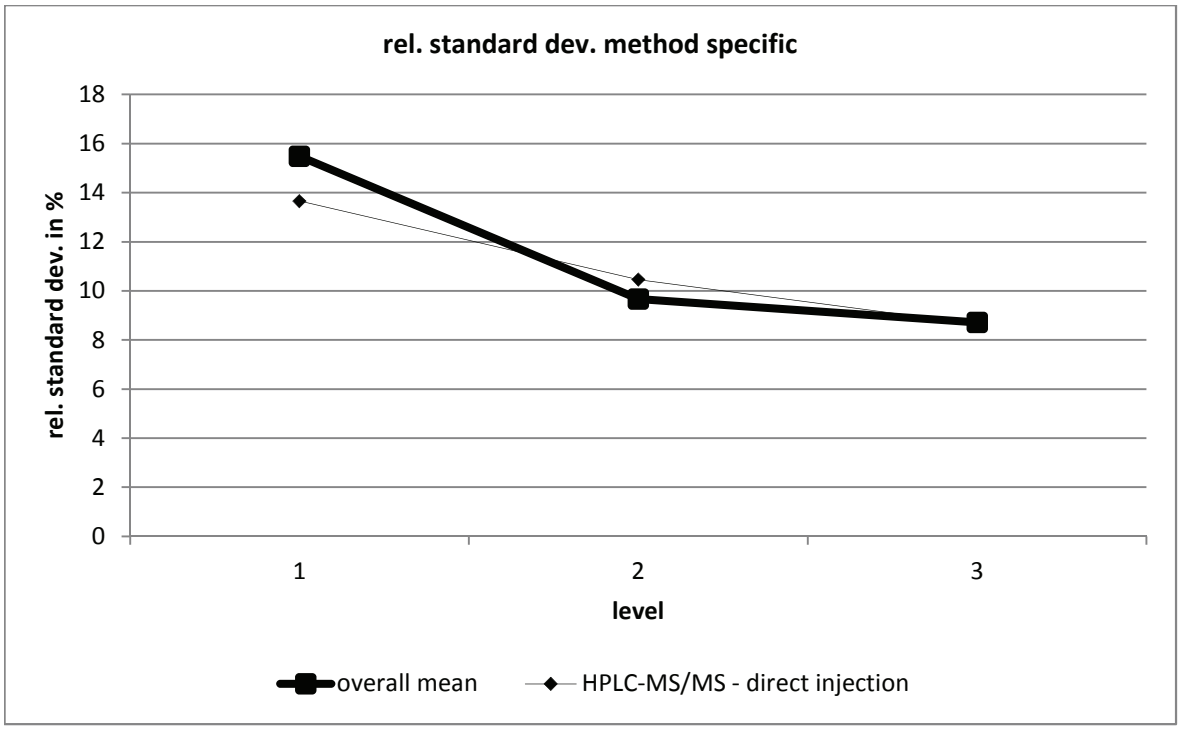
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1142 | 0,0097 | 8,5 | 0,1244 | 0,0023 | 1,9 |
| 2 | 0,2716 | 0,0148 | 5,4 | 0,2956 | 0,0056 | 1,9 |
| 3 | 0,6083 | 0,0307 | 5,0 | 0,6624 | 0,0126 | 1,9 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

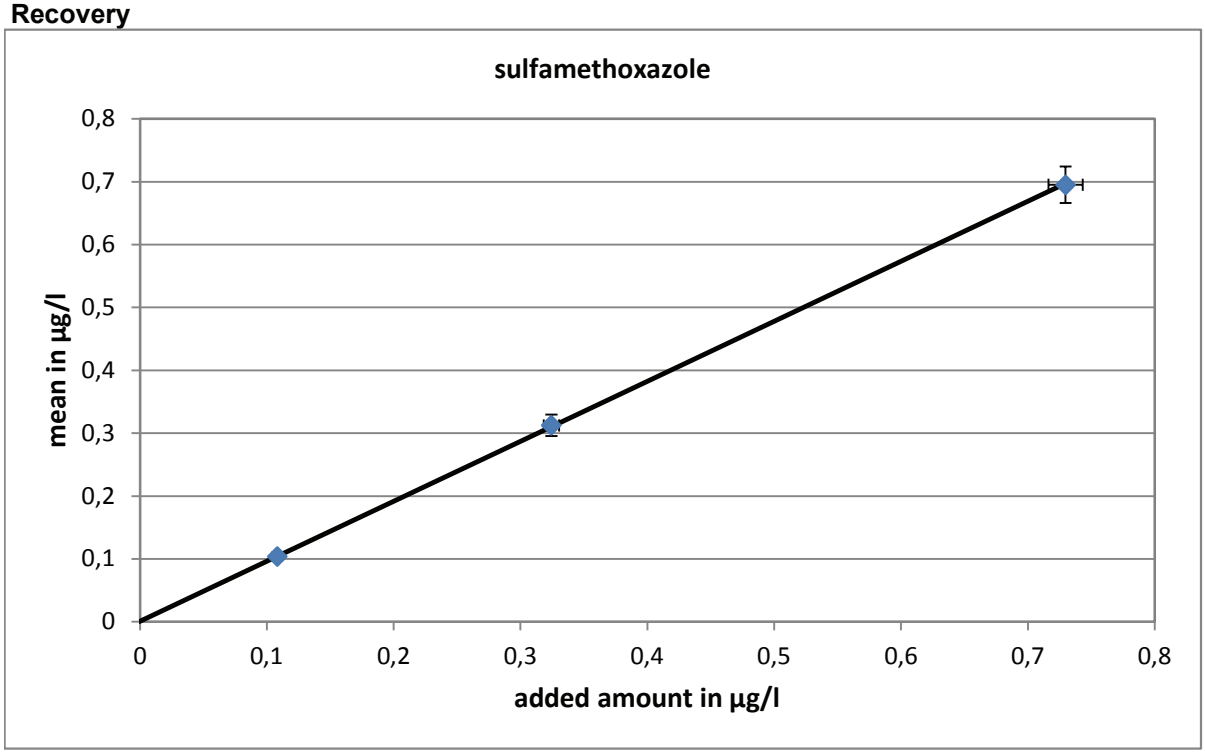



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,114 | 0,005 | 4,269 | 0,016 | 13,66 | 16 | 1 | 2 | 18,75 |
| 2 | 0,278 | 0,009 | 3,269 | 0,029 | 10,46 | 16 | 1 | 2 | 18,75 |
| 3 | 0,602 | 0,016 | 2,7 | 0,052 | 8,639 | 16 | 1 | 2 | 18,75 |

# sulfamethoxazole

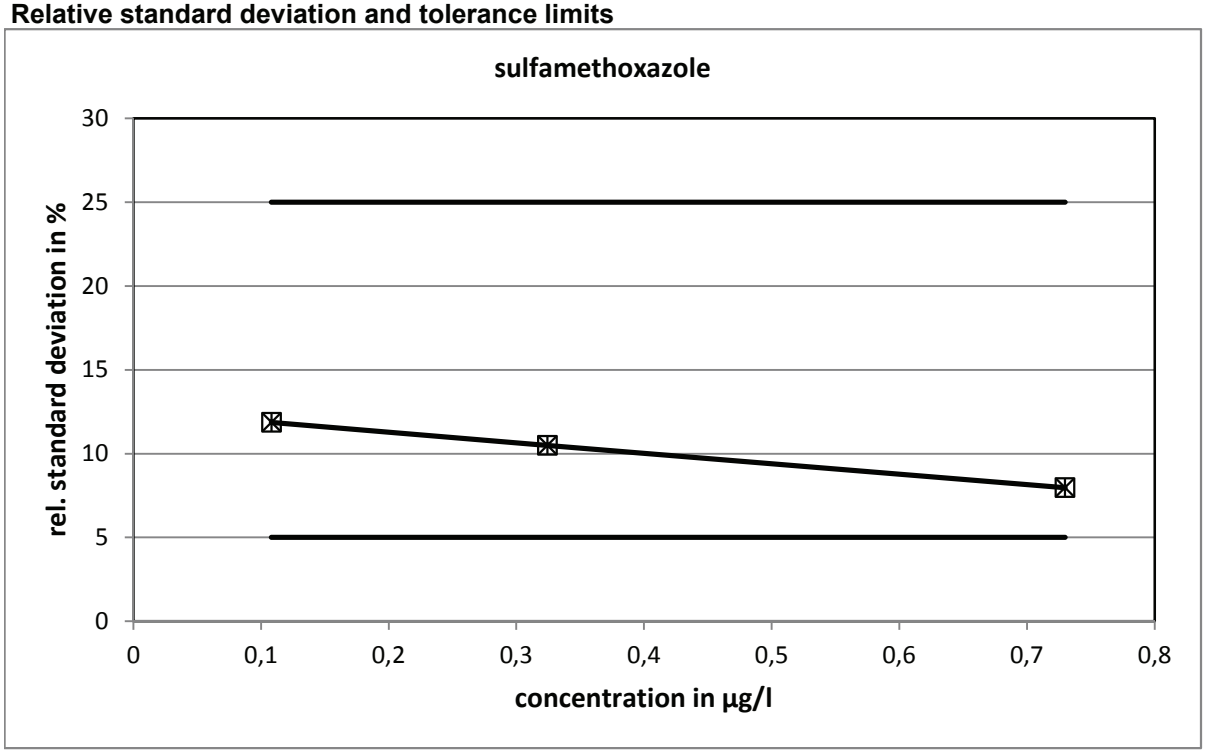
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1081 | 1,83 | 0,0128 | 0,0128 | 11,87 | 0,1356 | 0,0838 | 25,40 | -22,45 | 25 | 0 | 1 | 4,0 |
| 2 | 0,3243 | 1,84 | 0,0340 | 0,0340 | 10,50 | 0,3965 | 0,2596 | 22,26 | -19,97 | 25 | 0 | 0 | 0,0 |
| 3 | 0,7298 | 1,84 | 0,0582 | 0,0582 | 7,98 | 0,8514 | 0,6178 | 16,68 | -15,34 | 25 | 2 | 1 | 12,0 |
| | | | | | | | | | sum | 75 | 2 | 2 | 5,3 |

**Recovery**

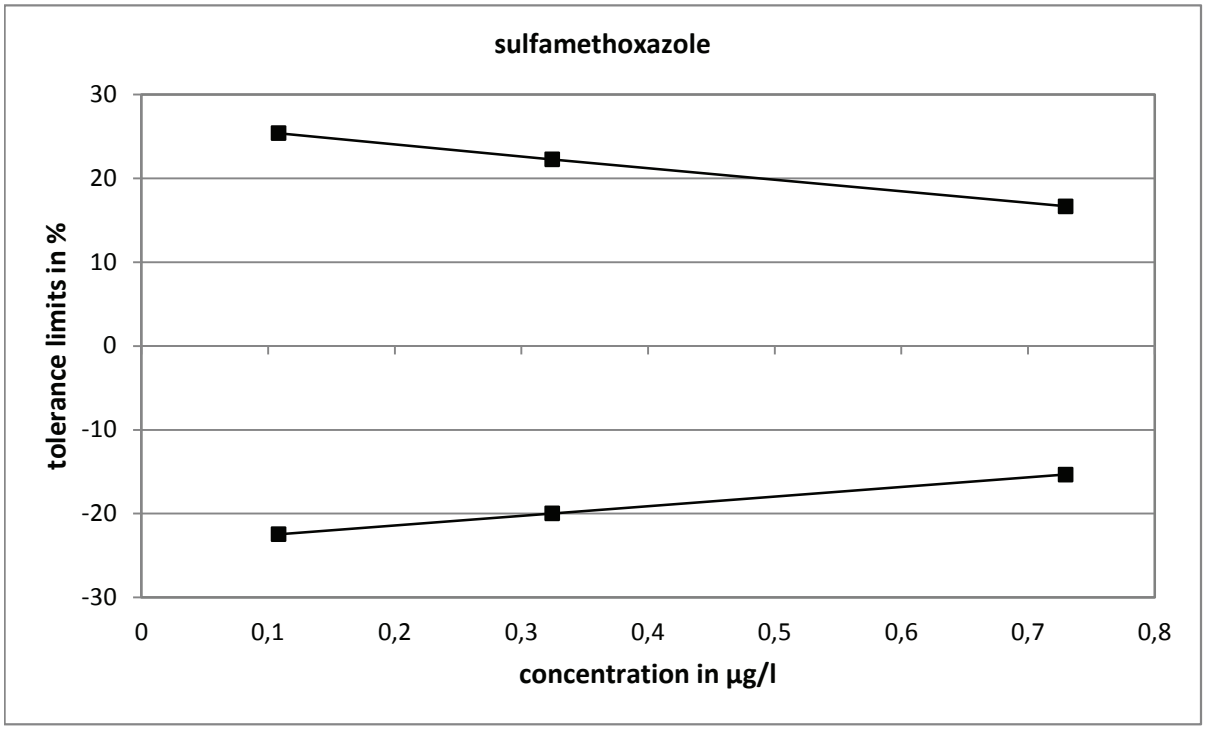



slope of the regression: 0,955
average recovery: 95,5%

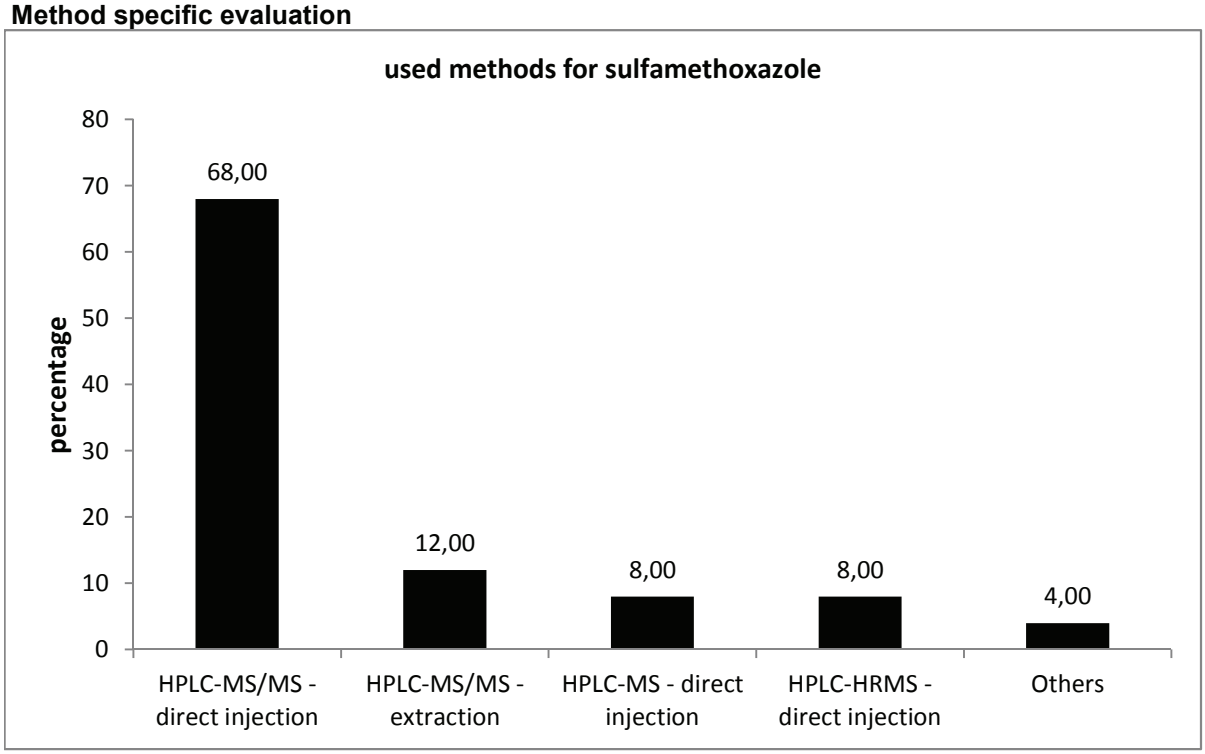
**Relative standard deviation and tolerance limits**

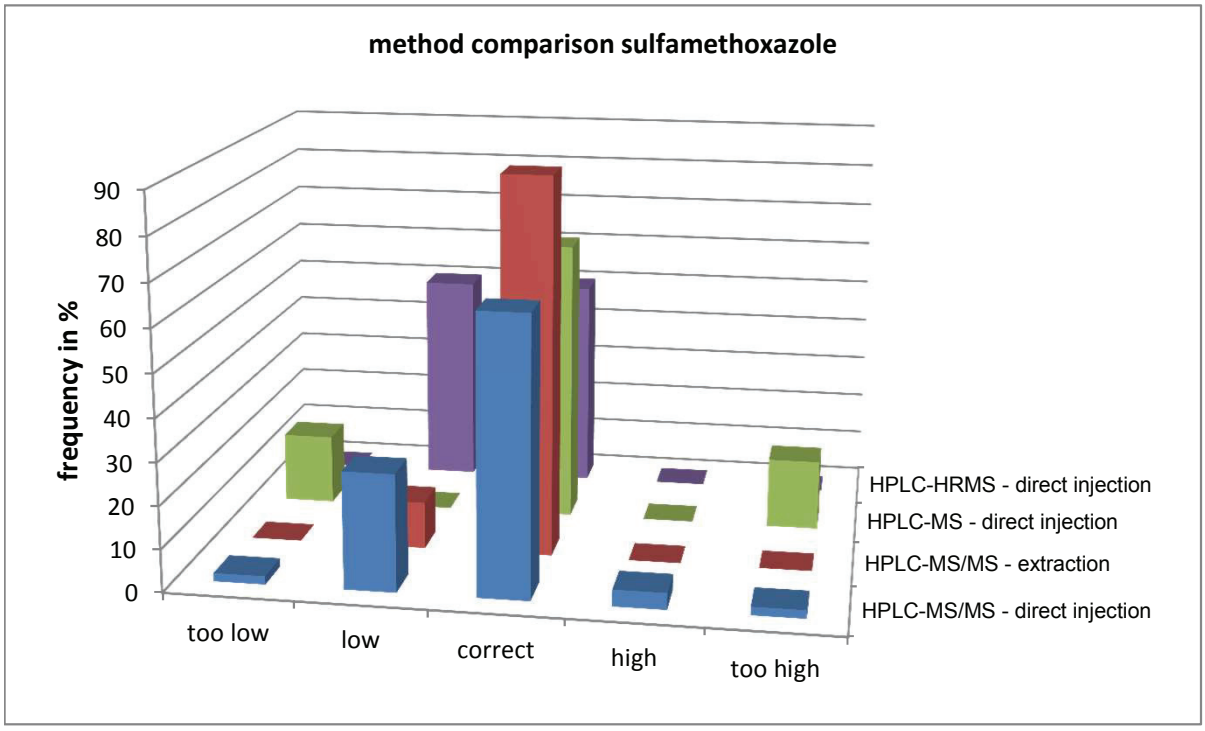



The relative standard deviations, calculated with the Q-method, did not reach the limits.



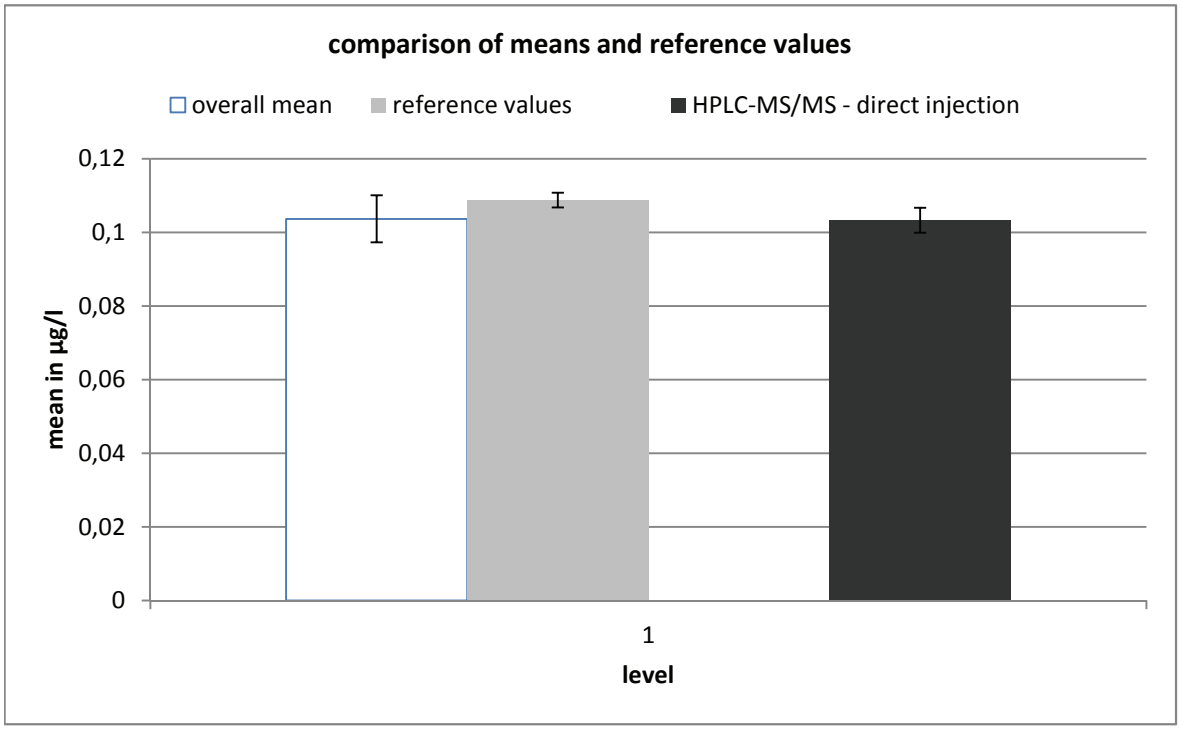
**Method specific evaluation**

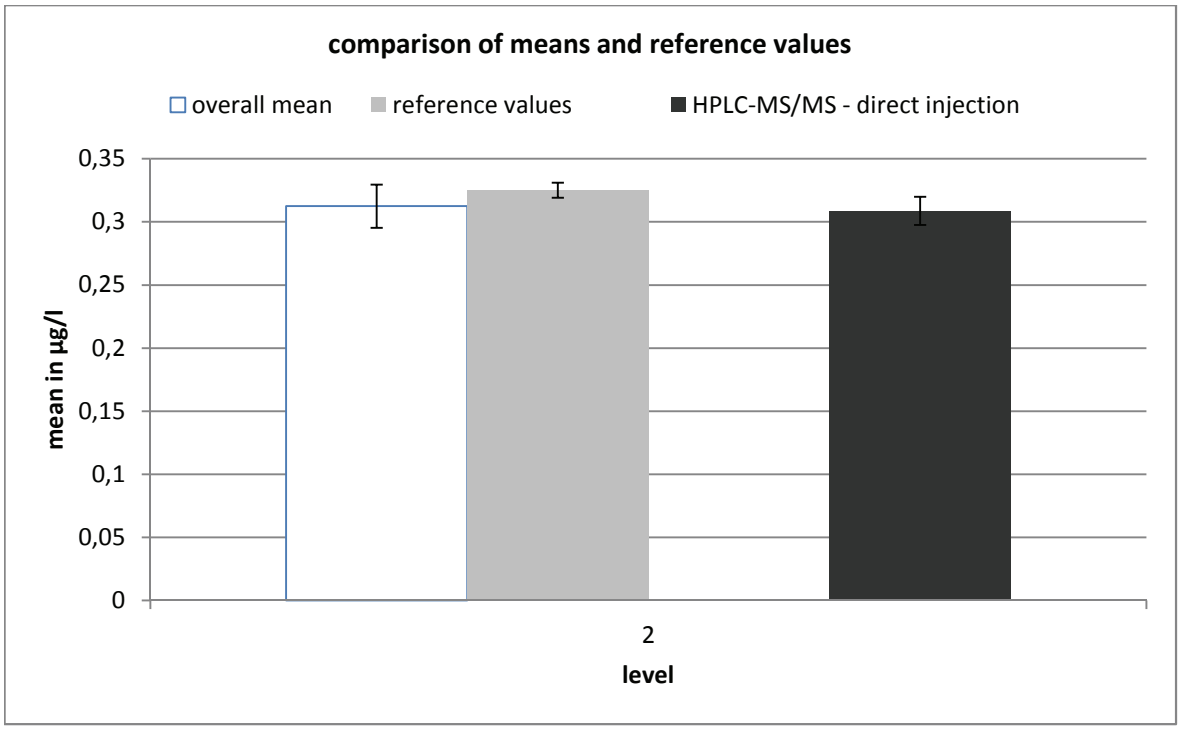


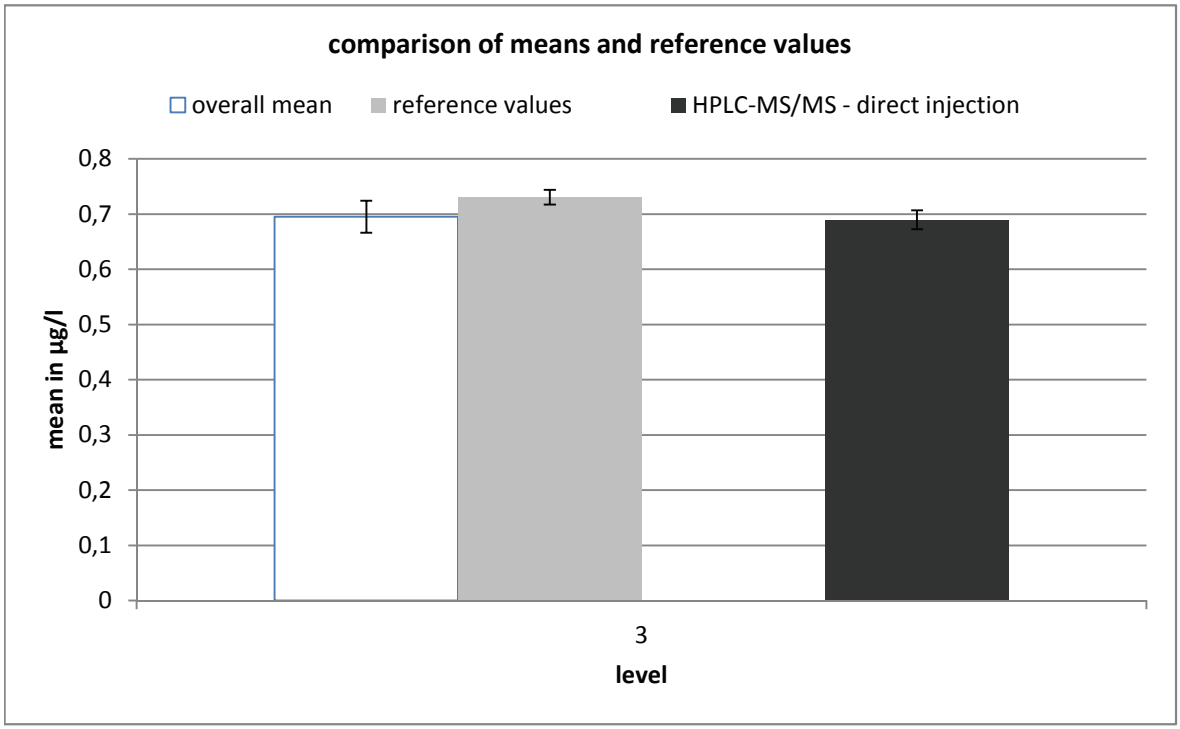



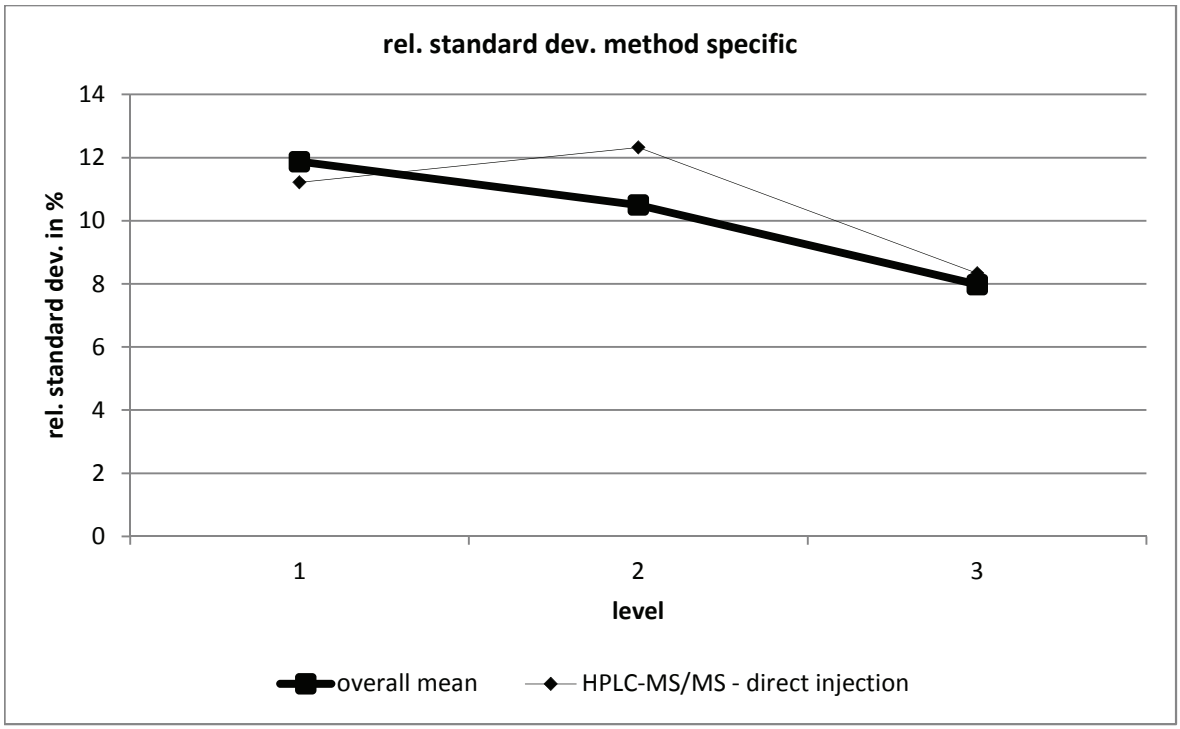
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1037 | 0,0064 | 6,2 | 0,1088 | 0,0020 | 1,8 |
| 2 | 0,3124 | 0,0170 | 5,4 | 0,3250 | 0,0060 | 1,8 |
| 3 | 0,6952 | 0,0291 | 4,2 | 0,7304 | 0,0135 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

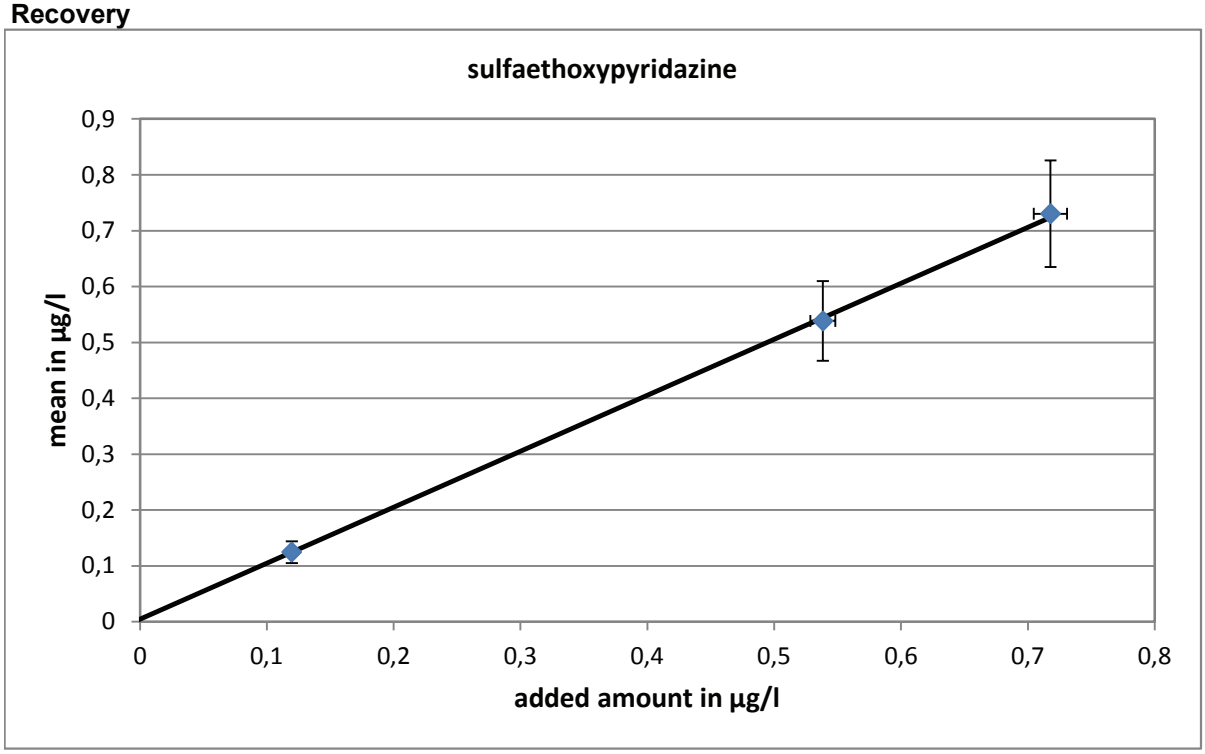



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,103 | 0,003 | 3,306 | 0,012 | 11,22 | 18 | 1 | 0 | 5,556 |
| 2 | 0,309 | 0,011 | 3,63 | 0,038 | 12,32 | 18 | 1 | 0 | 5,556 |
| 3 | 0,69 | 0,017 | 2,456 | 0,057 | 8,337 | 18 | 1 | 1 | 11,11 |

# sulfaethoxypyridazine

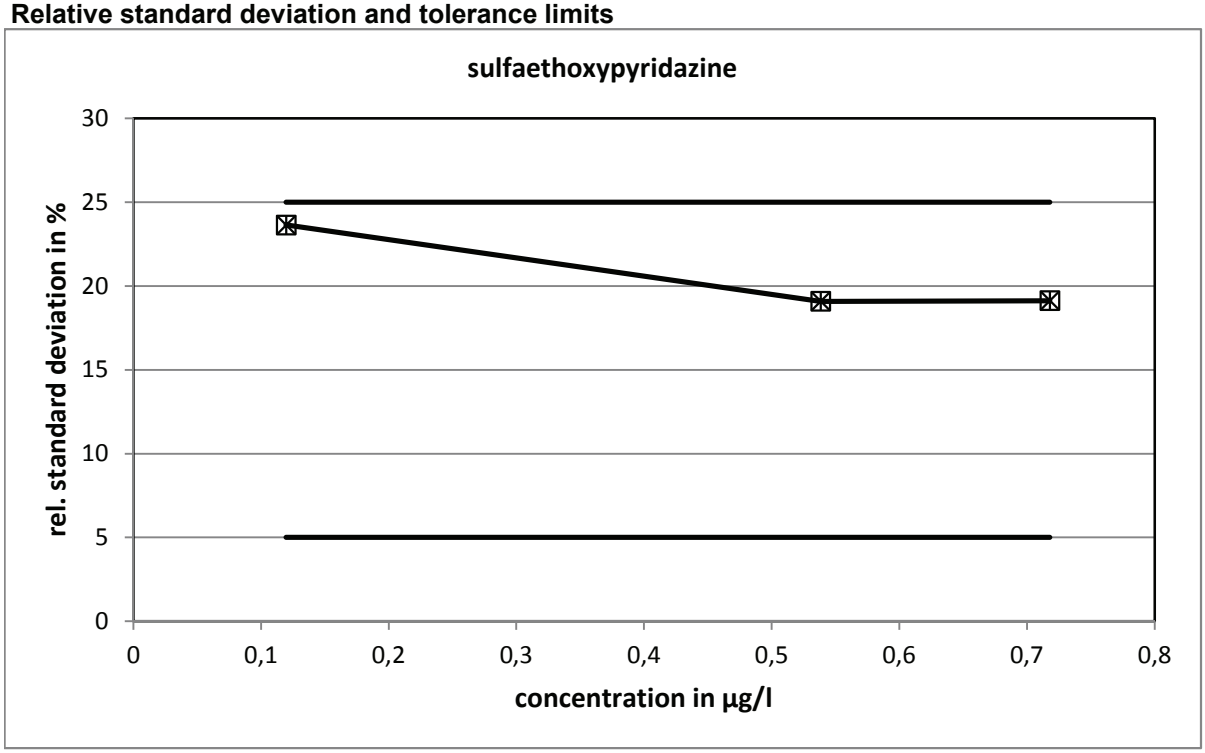
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1196 | 1,76 | 0,0283 | 0,0283 | 23,65 | 0,1843 | 0,0681 | 54,01 | -43,06 | 13 | 0 | 1 | 7,7 |
| 2 | 0,5384 | 1,81 | 0,1028 | 0,1028 | 19,09 | 0,7676 | 0,3489 | 42,57 | -35,20 | 13 | 1 | 0 | 7,7 |
| 3 | 0,7179 | 1,82 | 0,1373 | 0,1373 | 19,12 | 1,023 | 0,4645 | 42,57 | -35,29 | 13 | 0 | 0 | 0,0 |
| | | | | | | | | | sum | 39 | 1 | 1 | 5,1 |

**Recovery**

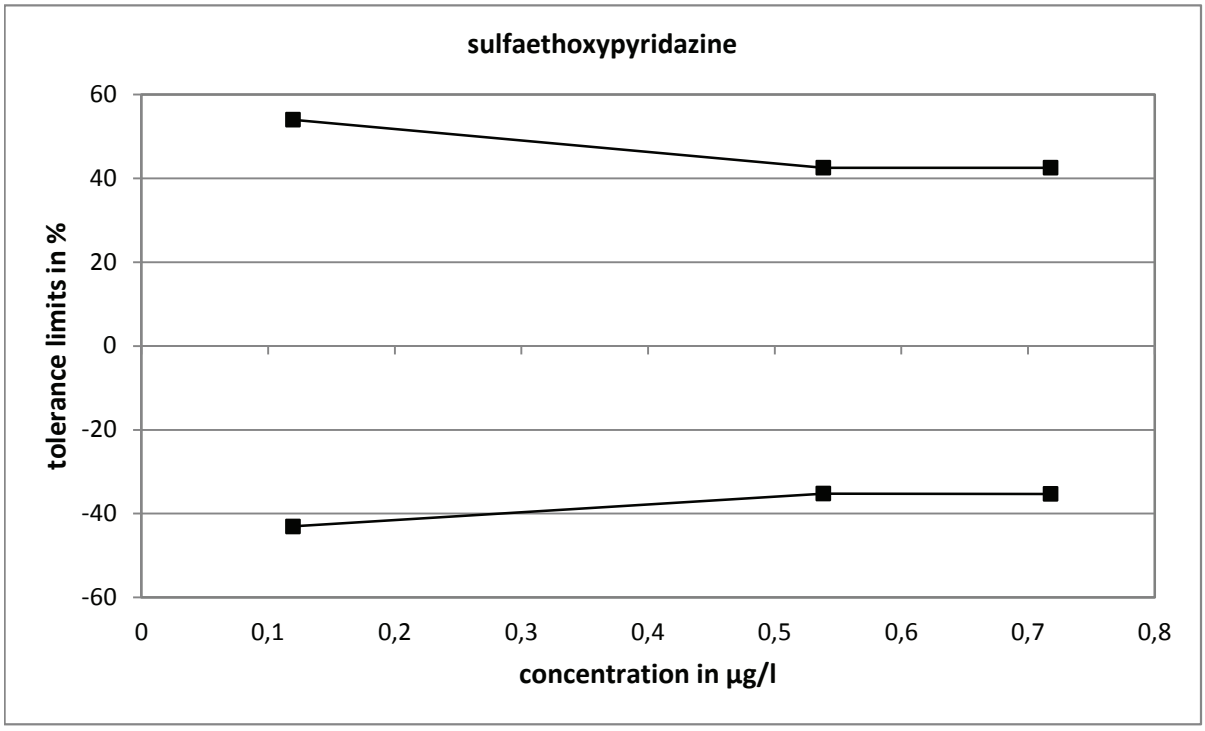



slope of the regression: 0,1002
average recovery: 100,2%

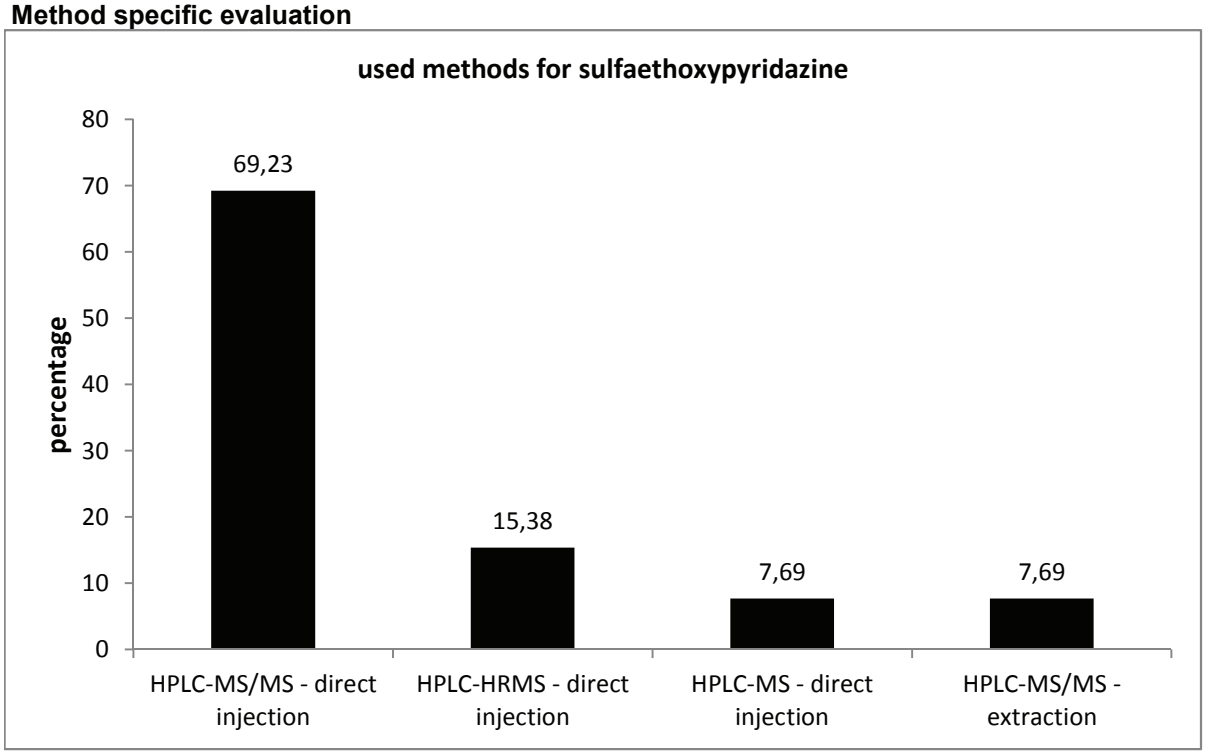
**Relative standard deviation and tolerance limits**

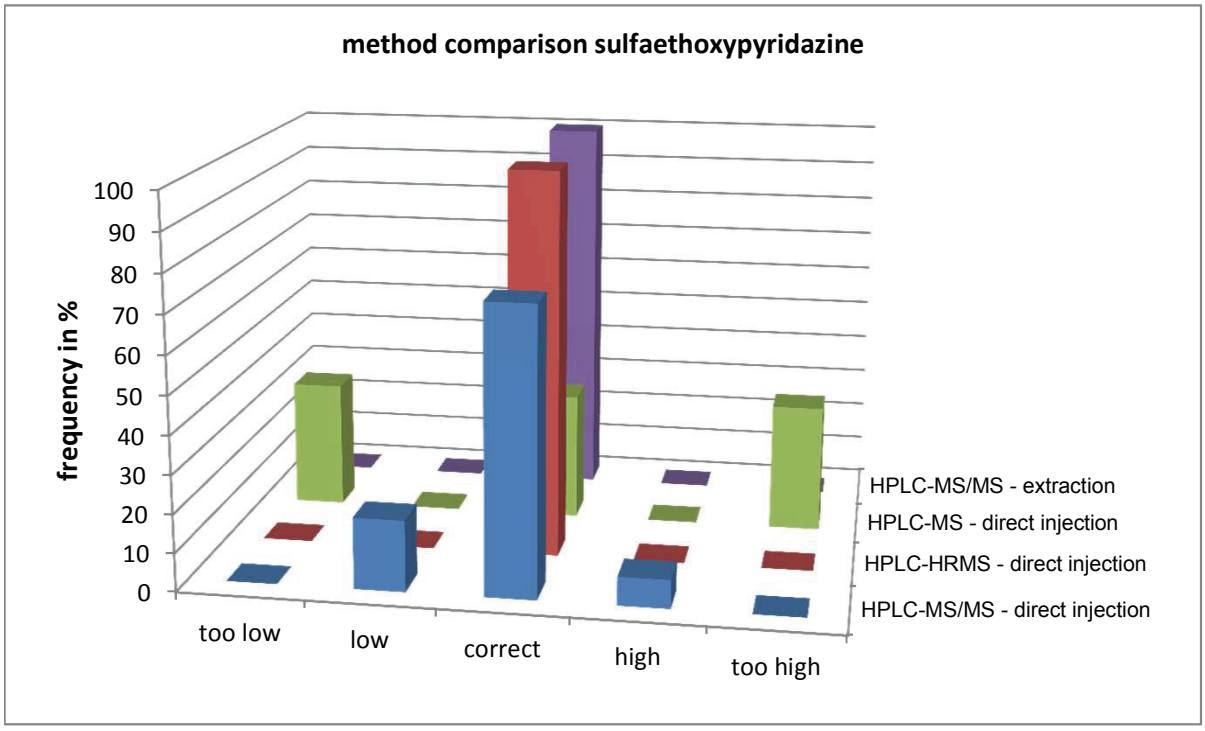



The relative standard deviations, calculated with the Q-method, did not reach the limits.



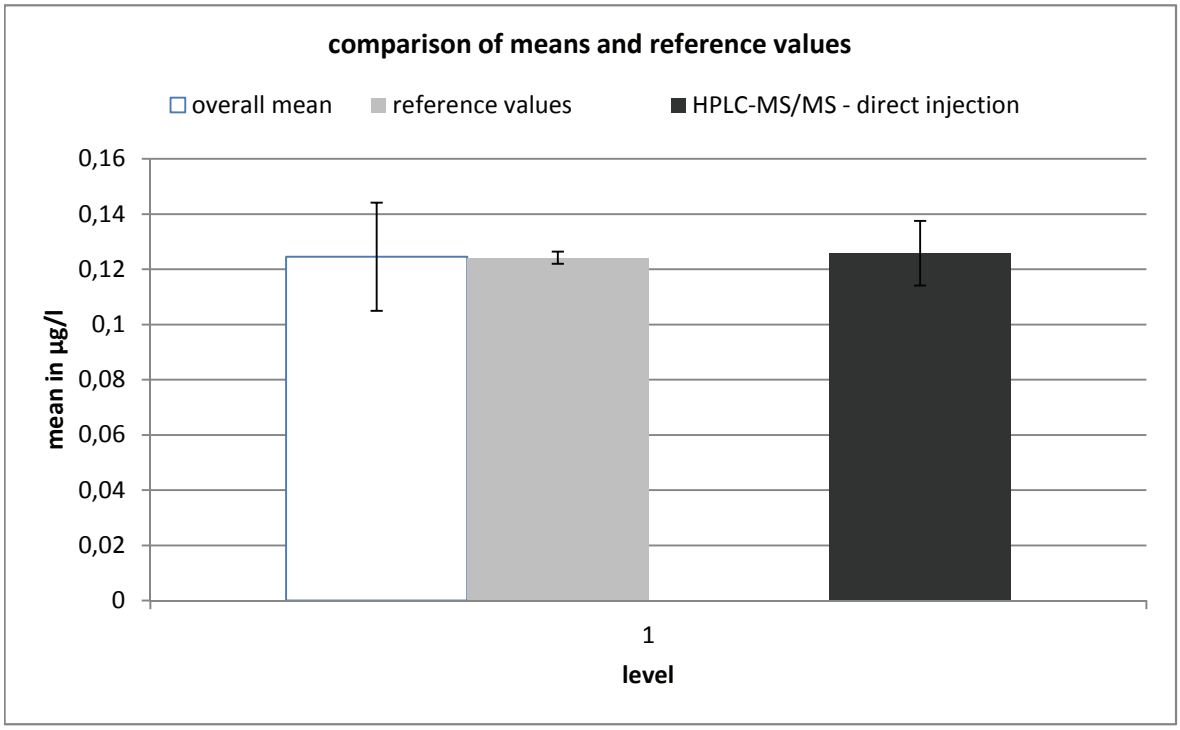
**Method specific evaluation**

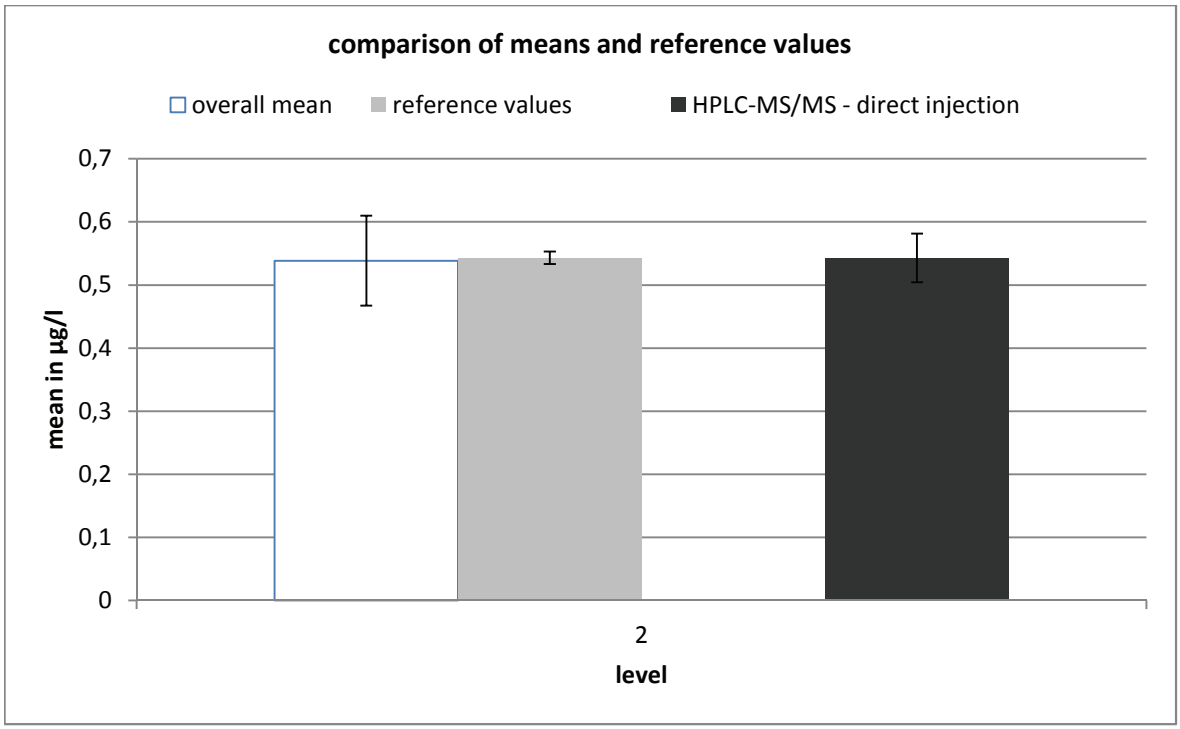


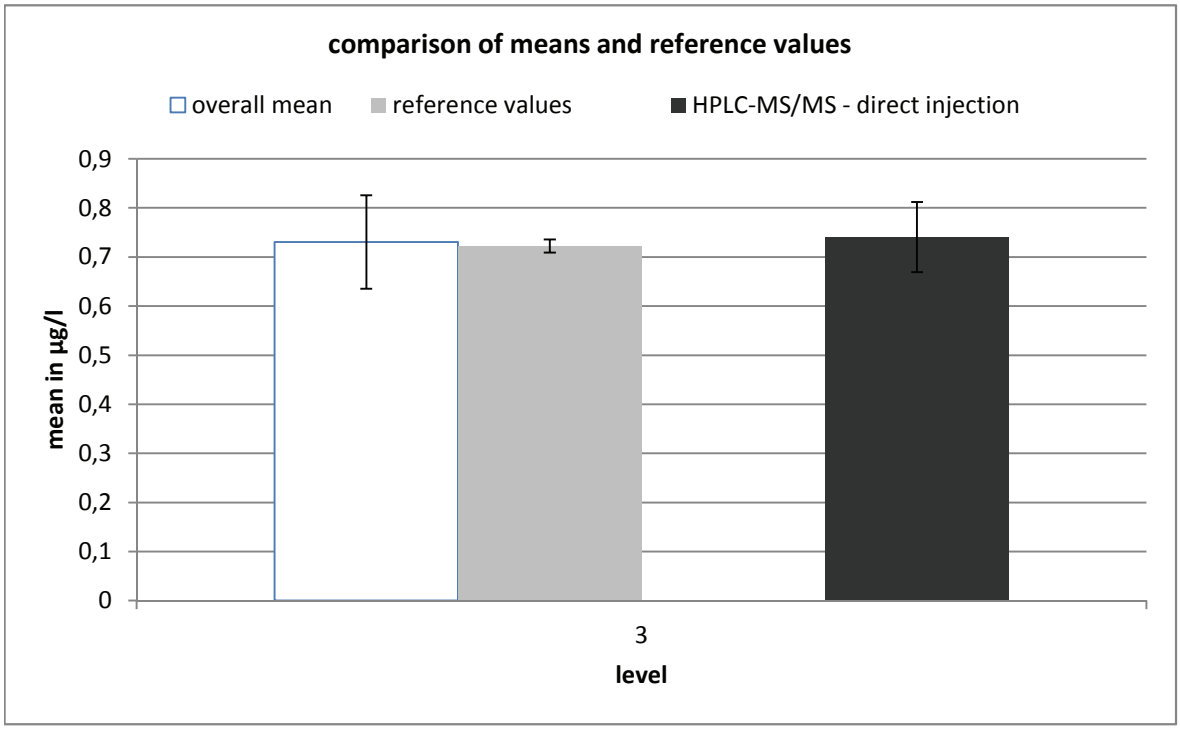



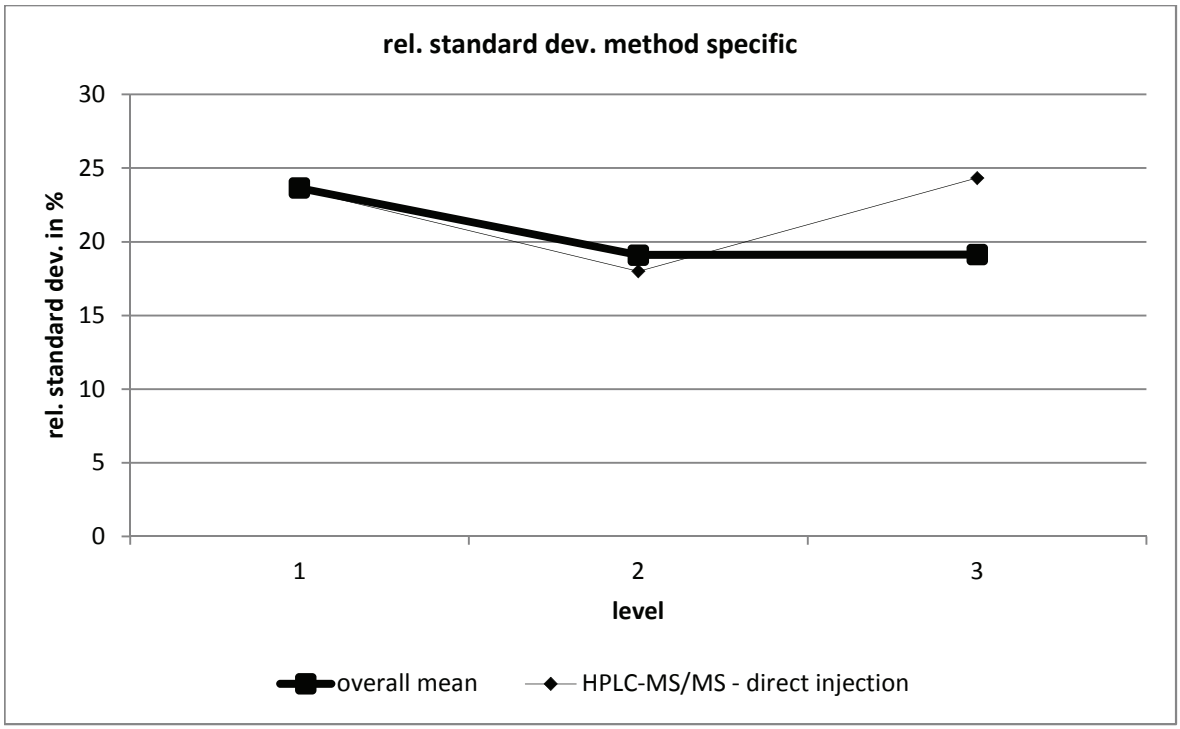
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1245 | 0,0196 | 15,8 | 0,1242 | 0,0022 | 1,8 |
| 2 | 0,5385 | 0,0713 | 13,2 | 0,5429 | 0,0099 | 1,8 |
| 3 | 0,7304 | 0,0952 | 13,0 | 0,7224 | 0,0131 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

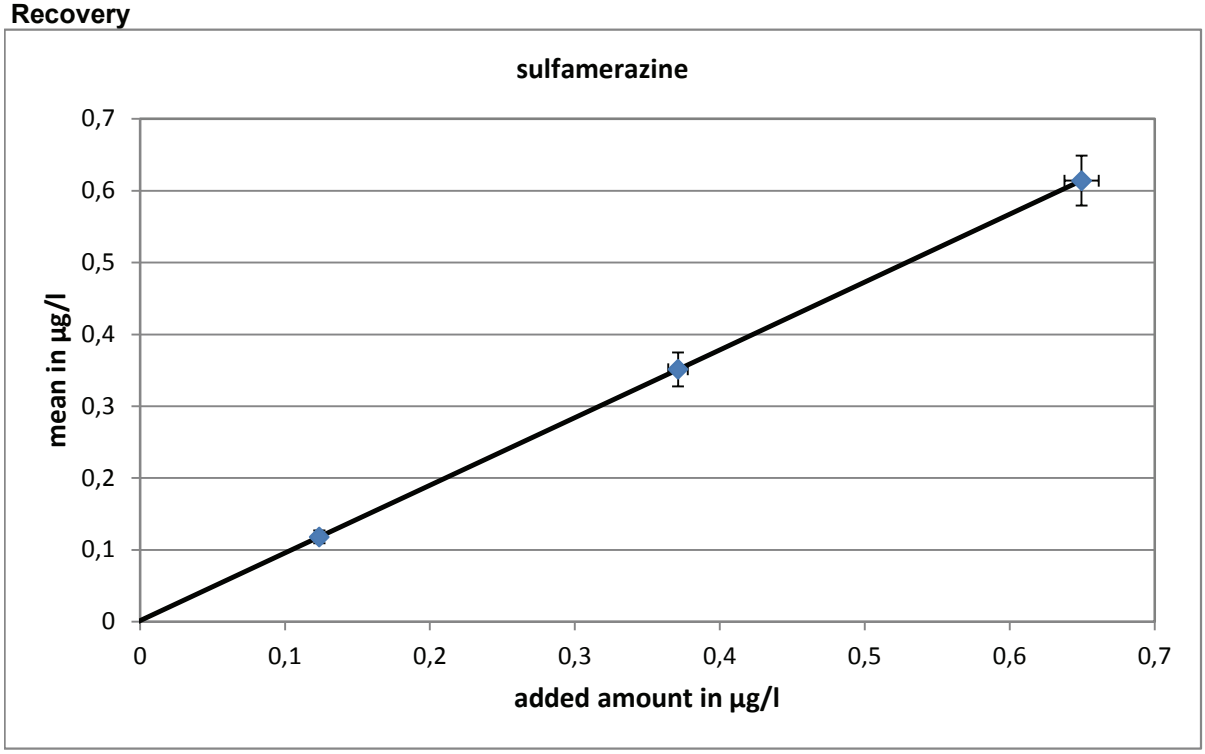



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,126 | 0,012 | 9,299 | 0,03 | 23,52 | 10 | 0 | 1 | 10 |
| 2 | 0,543 | 0,039 | 7,114 | 0,098 | 18 | 10 | 0 | 0 | 0 |
| 3 | 0,741 | 0,071 | 9,619 | 0,18 | 24,33 | 10 | 0 | 0 | 0 |

# sulfamerazine

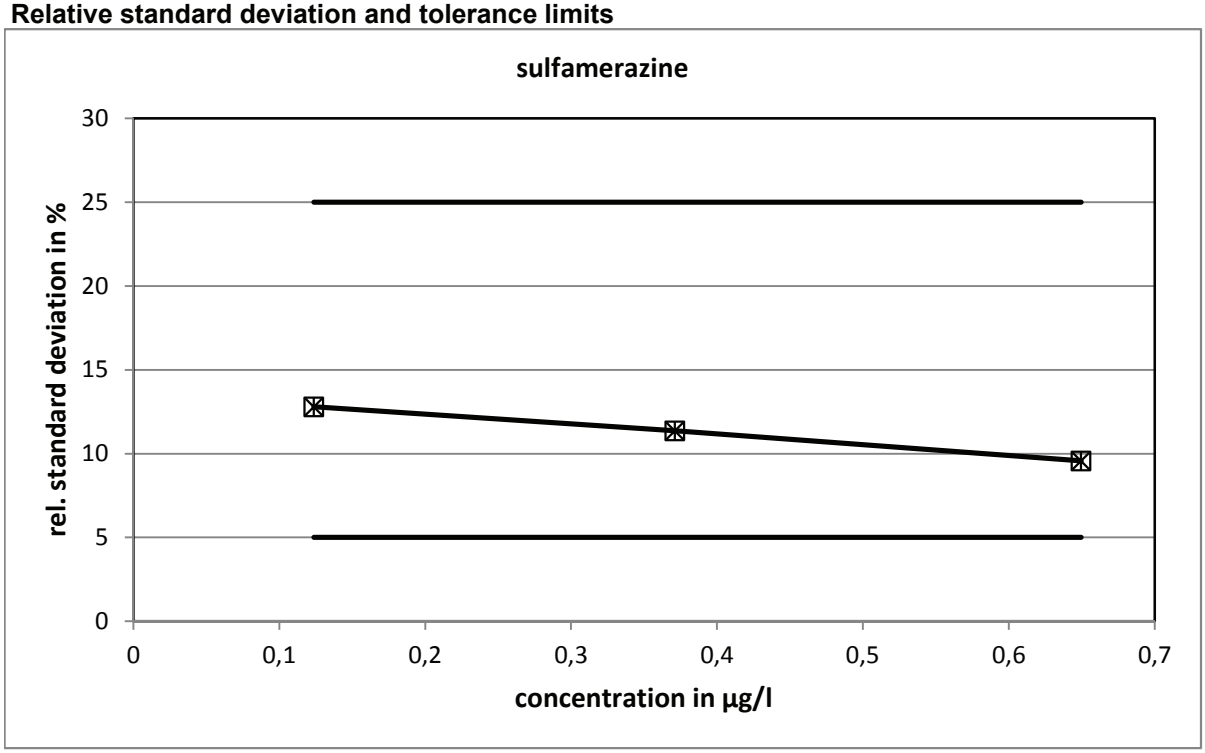
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1237 | 1,80 | 0,0158 | 0,0158 | 12,80 | 0,1578 | 0,0939 | 27,55 | -24,10 | 20 | 0 | 0 | 0,0 |
| 2 | 0,3712 | 1,81 | 0,0422 | 0,0422 | 11,36 | 0,4612 | 0,2913 | 24,25 | -21,52 | 20 | 2 | 1 | 15,0 |
| 3 | 0,6496 | 1,82 | 0,0621 | 0,0621 | 9,57 | 0,7808 | 0,5309 | 20,20 | -18,26 | 20 | 2 | 1 | 15,0 |
| | | | | | | | | | sum | 60 | 4 | 2 | 10,0 |

**Recovery**

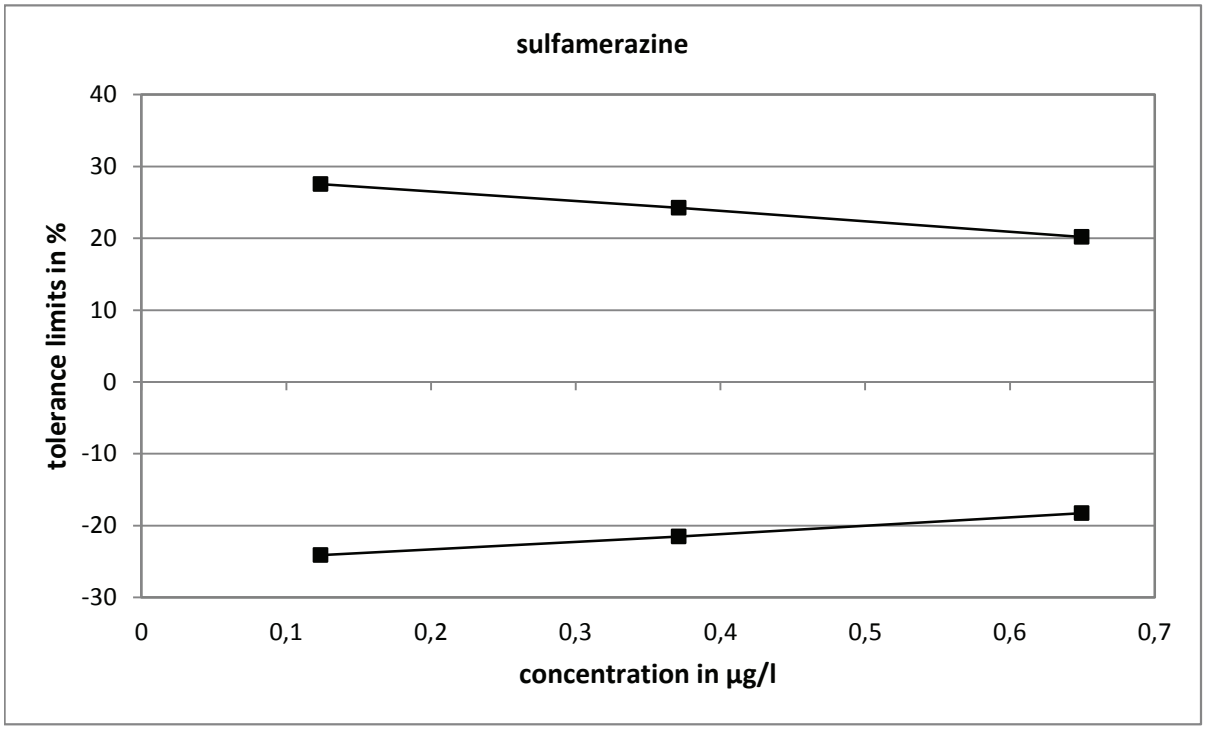



slope of the regression: 0,943
average recovery: 94,3%

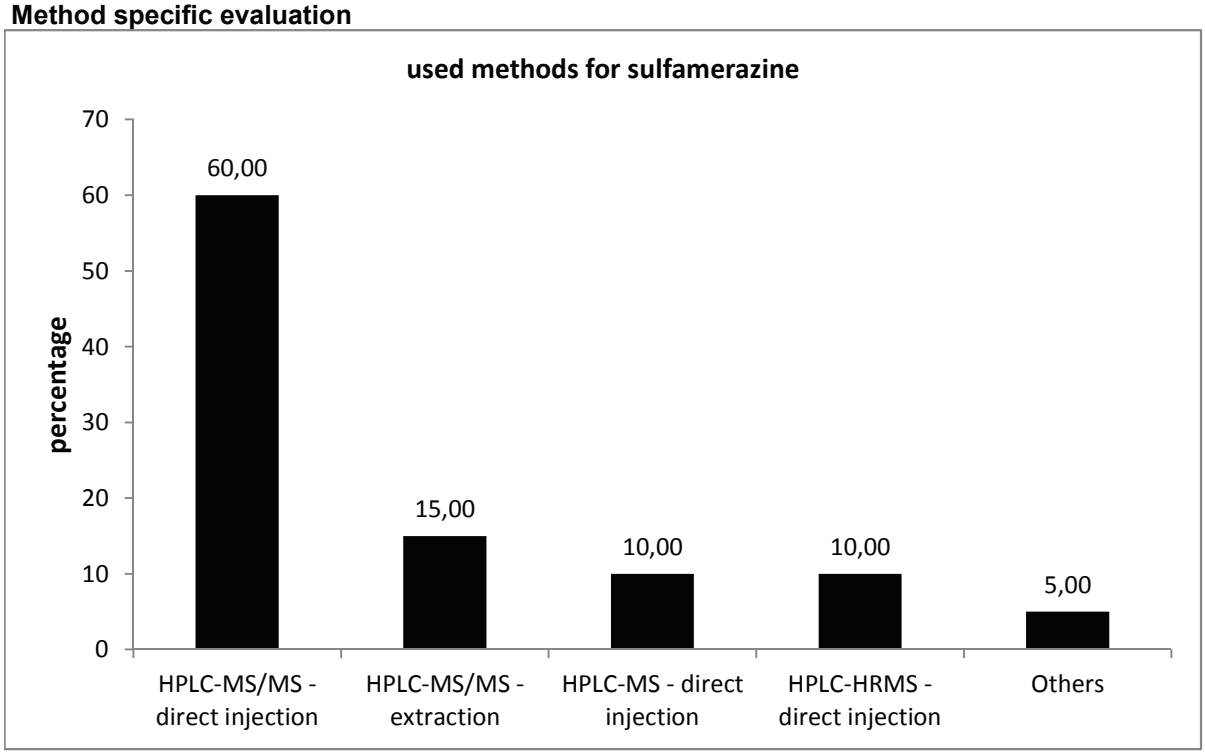
**Relative standard deviation and tolerance limits**

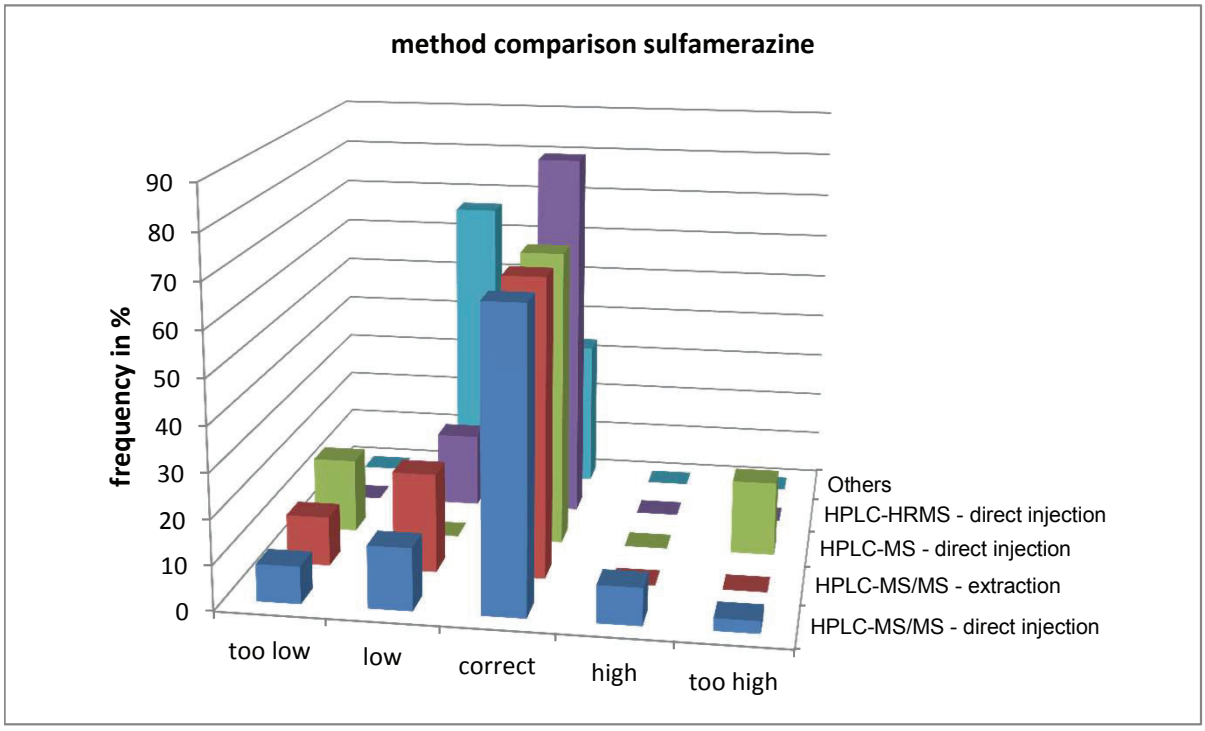



The relative standard deviations, calculated with the Q-method, did not reach the limits.



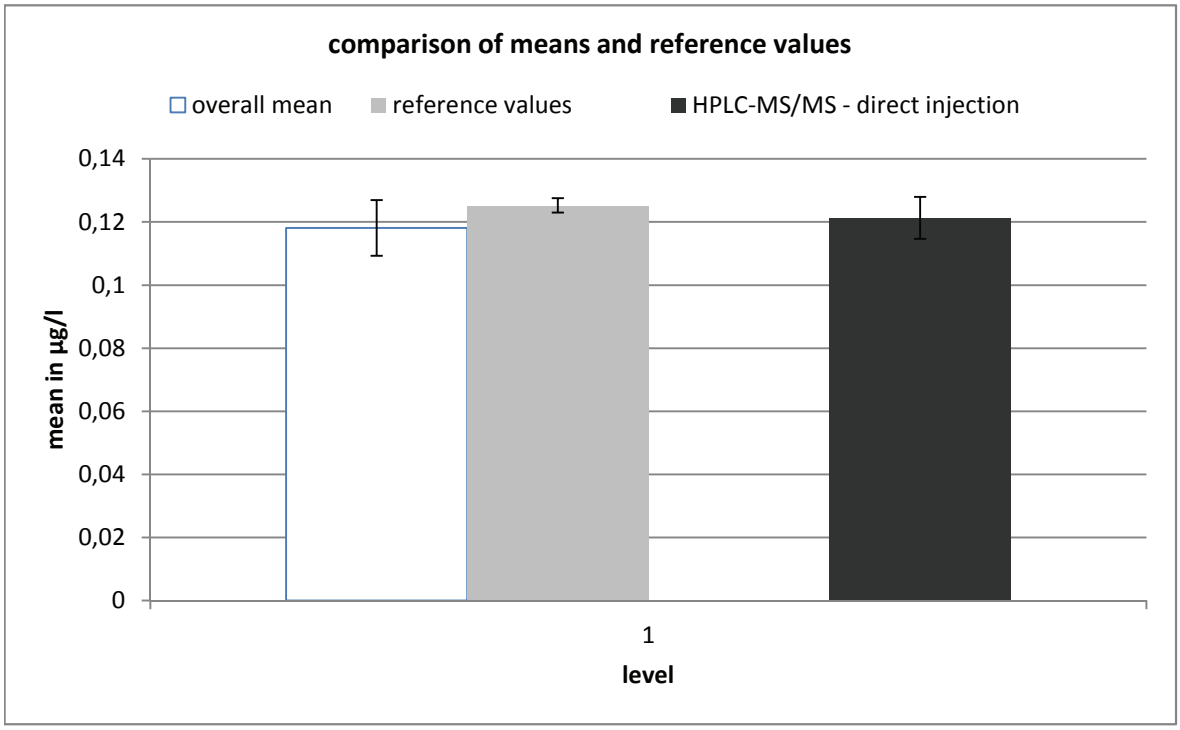
**Method specific evaluation**

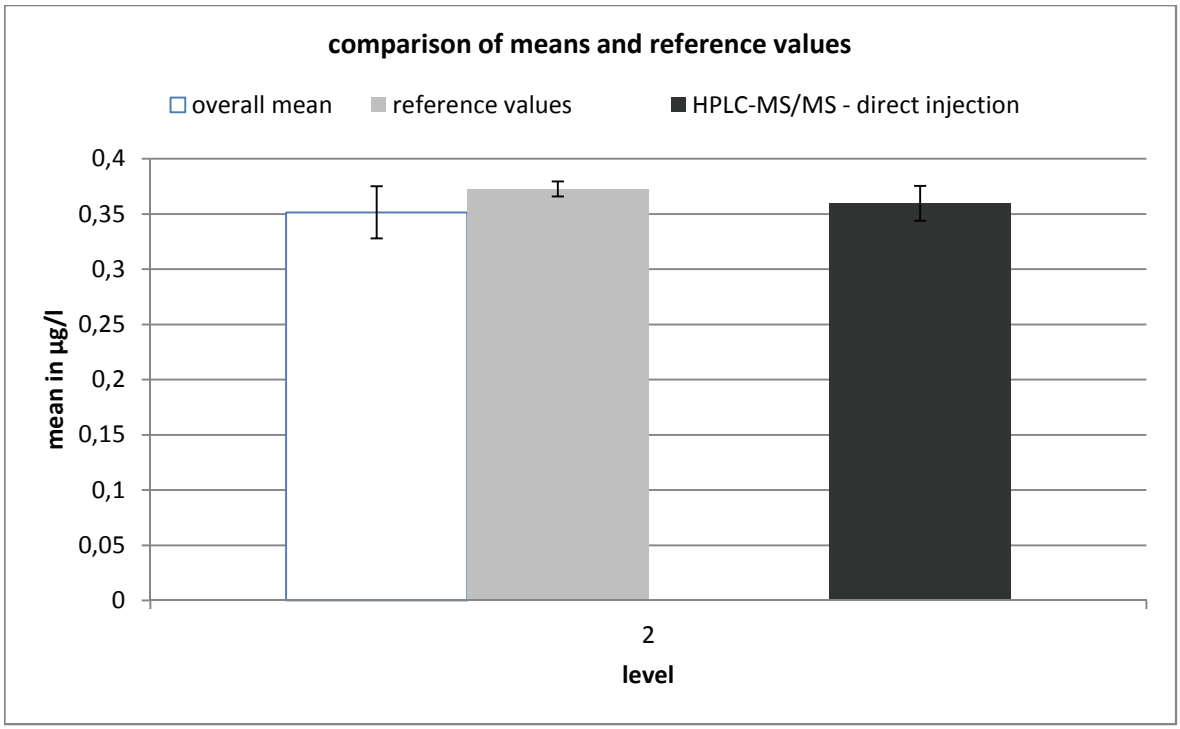


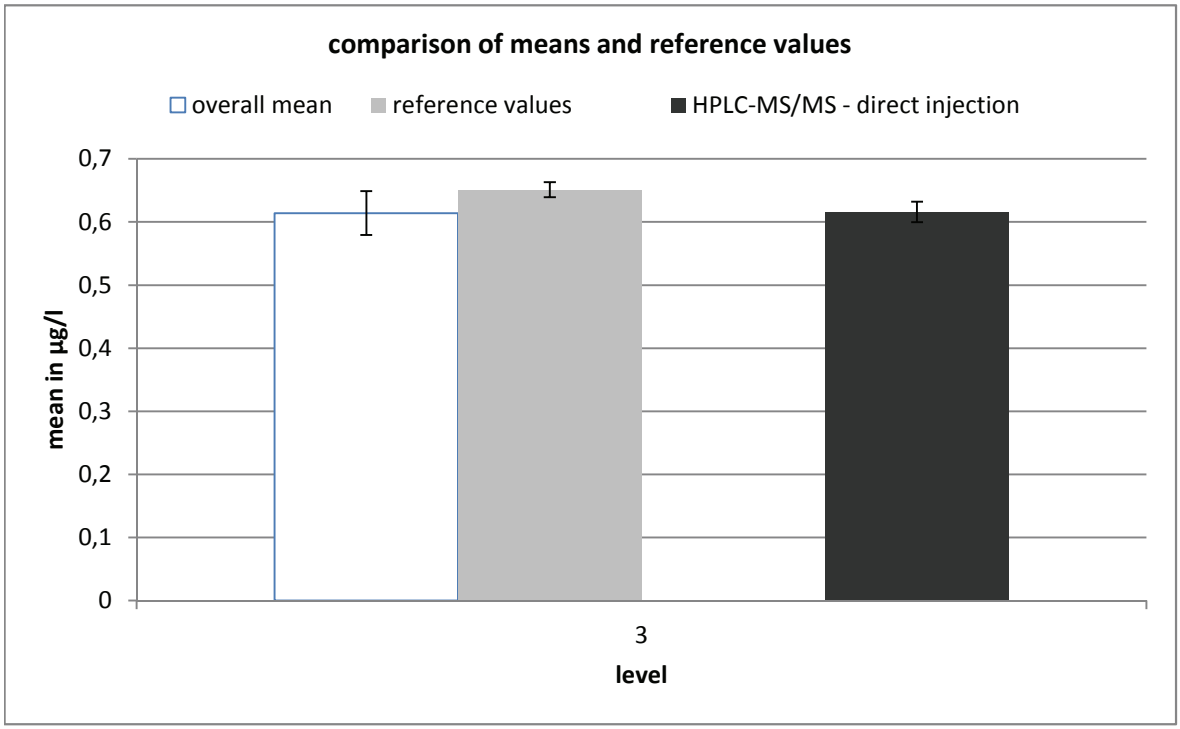



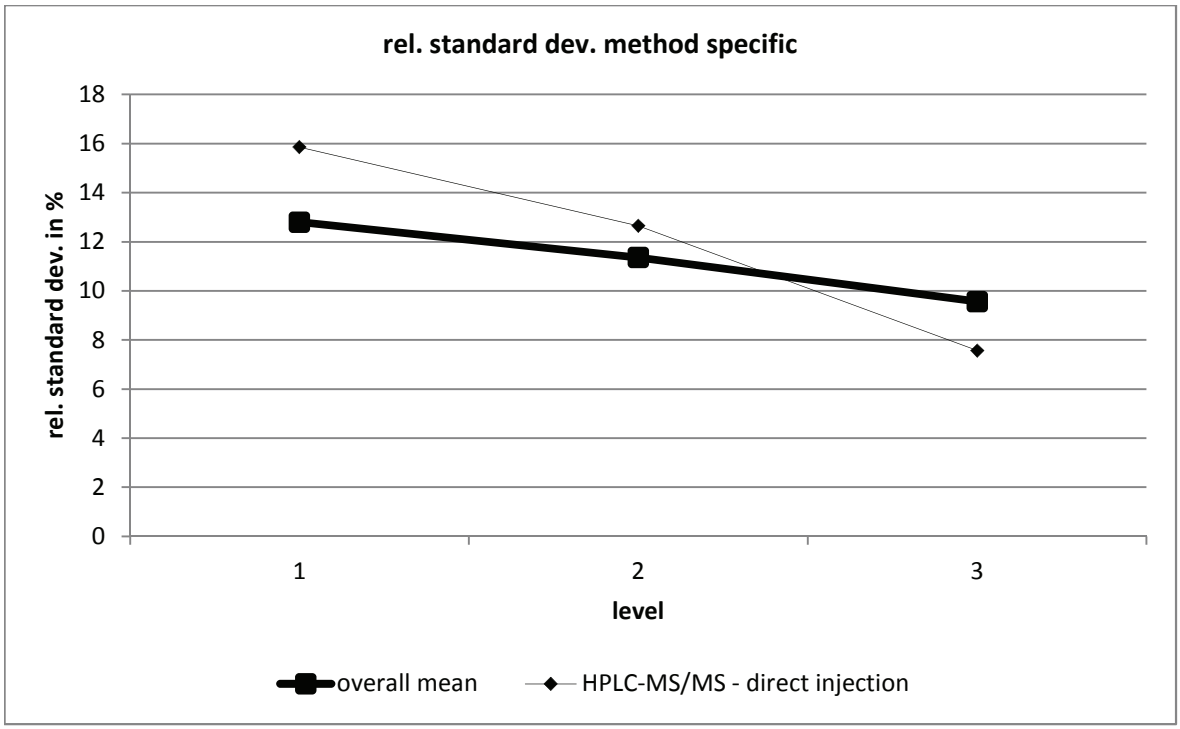
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1181 | 0,0089 | 7,5 | 0,1252 | 0,0023 | 1,8 |
| 2 | 0,3514 | 0,0236 | 6,7 | 0,3727 | 0,0068 | 1,8 |
| 3 | 0,6140 | 0,0347 | 5,7 | 0,6511 | 0,0118 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

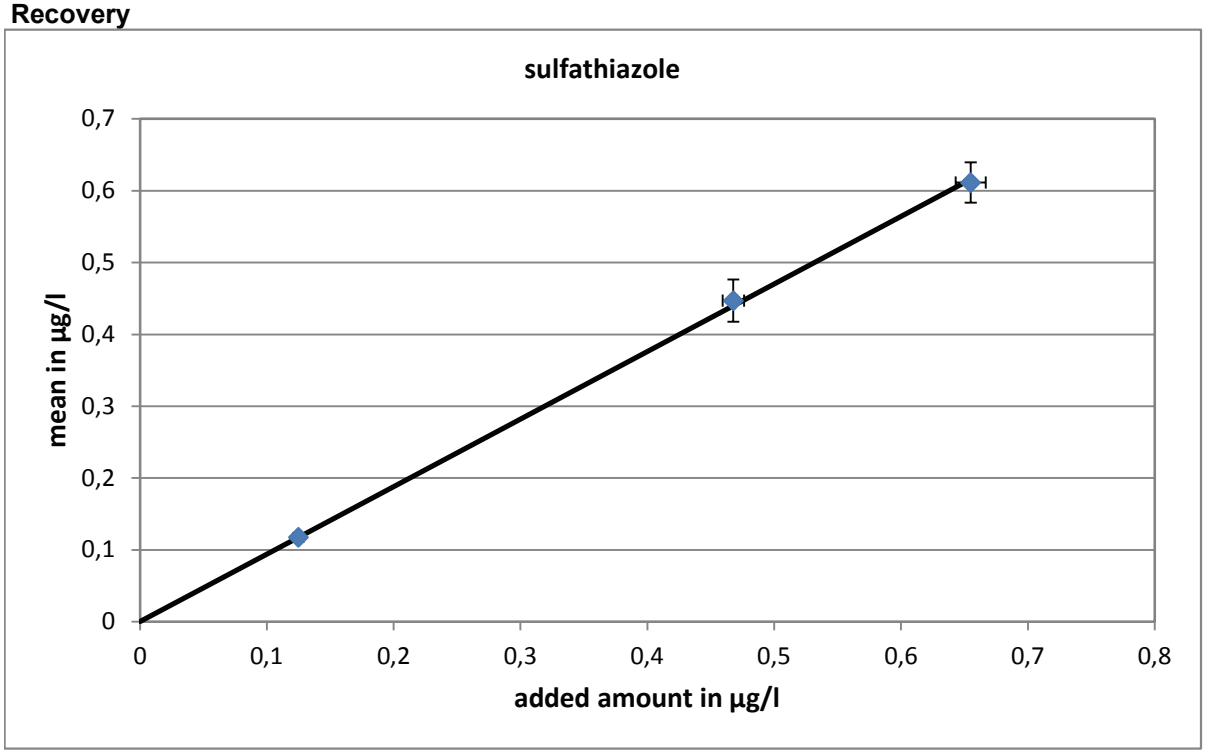



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,121 | 0,007 | 5,497 | 0,019 | 15,86 | 13 | 0 | 1 | 7,692 |
| 2 | 0,36 | 0,016 | 4,386 | 0,045 | 12,65 | 13 | 0 | 1 | 7,692 |
| 3 | 0,616 | 0,016 | 2,624 | 0,047 | 7,569 | 13 | 1 | 1 | 15,38 |

# sulfathiazole

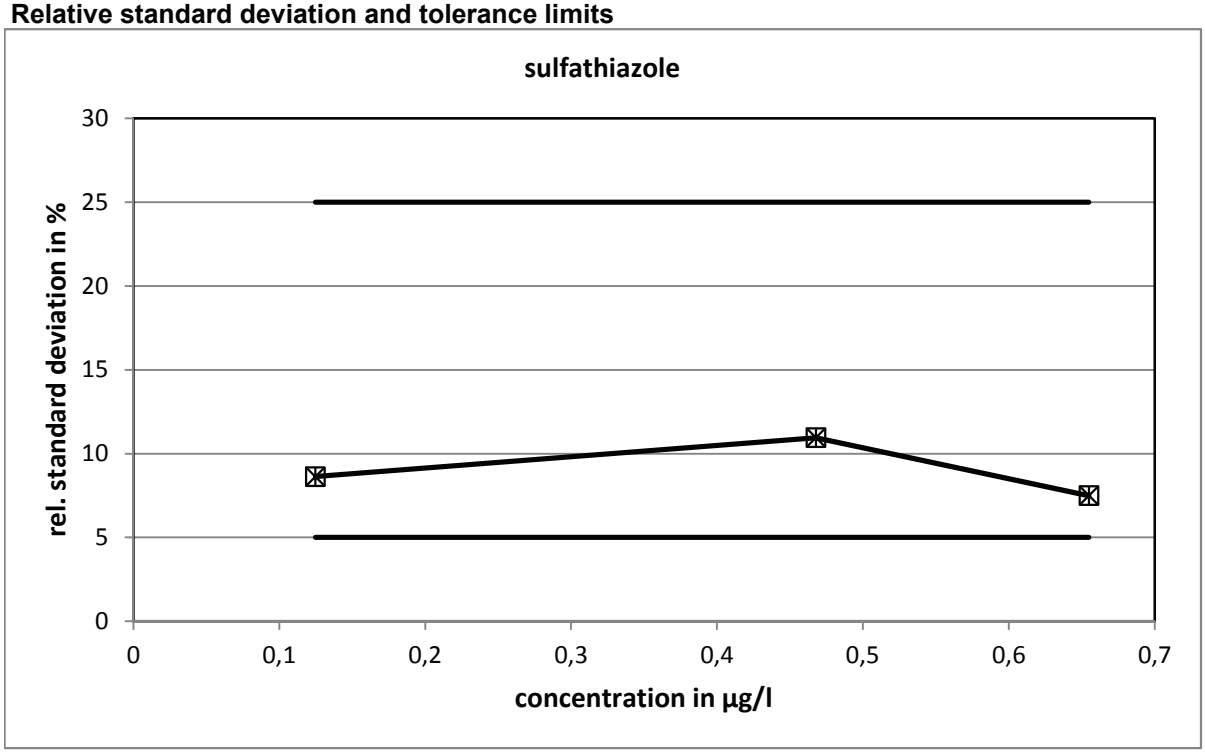
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1248 | 1,79 | 0,0108 | 0,0108 | 8,63 | 0,1474 | 0,1041 | 18,12 | -16,54 | 19 | 0 | 2 | 10,5 |
| 2 | 0,4678 | 1,79 | 0,0512 | 0,0512 | 10,95 | 0,5768 | 0,3706 | 23,30 | -20,78 | 19 | 0 | 2 | 10,5 |
| 3 | 0,6550 | 1,79 | 0,0491 | 0,0491 | 7,50 | 0,7574 | 0,5604 | 15,64 | -14,44 | 19 | 1 | 1 | 10,5 |
| | | | | | | | | | sum | 57 | 1 | 5 | 10,5 |

**Recovery**

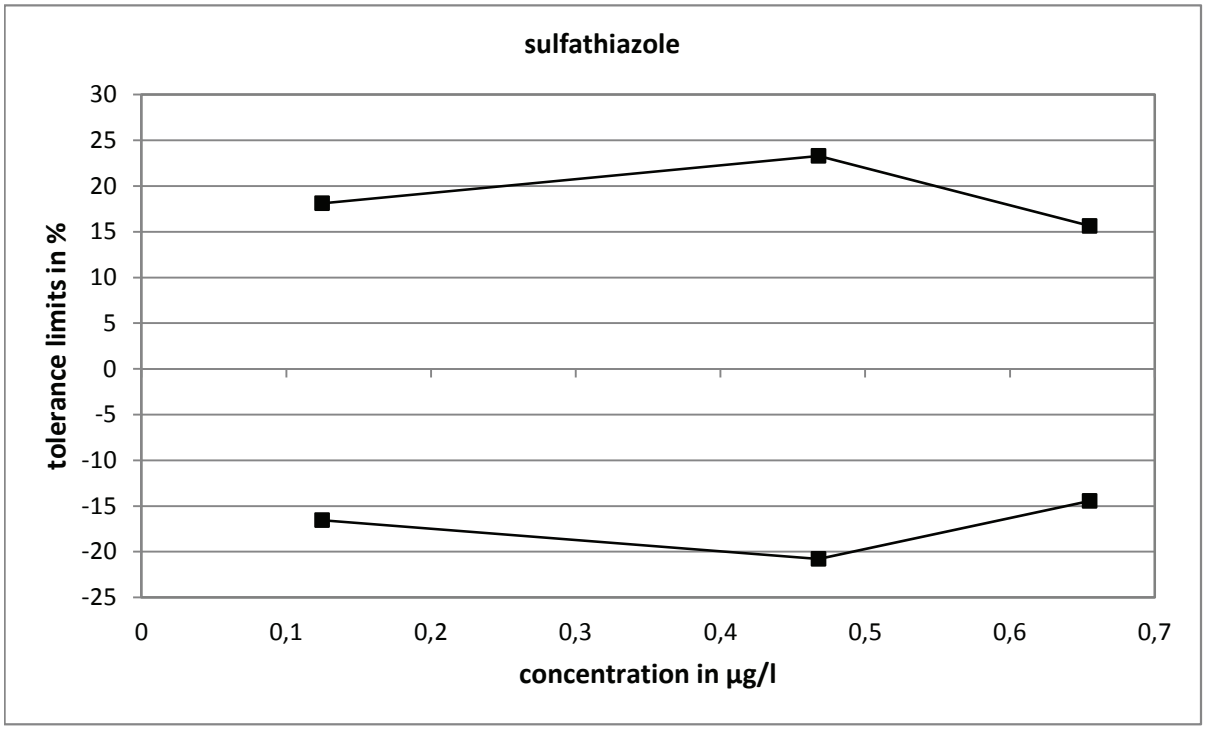



slope of the regression: 0,94
average recovery: 94,0%

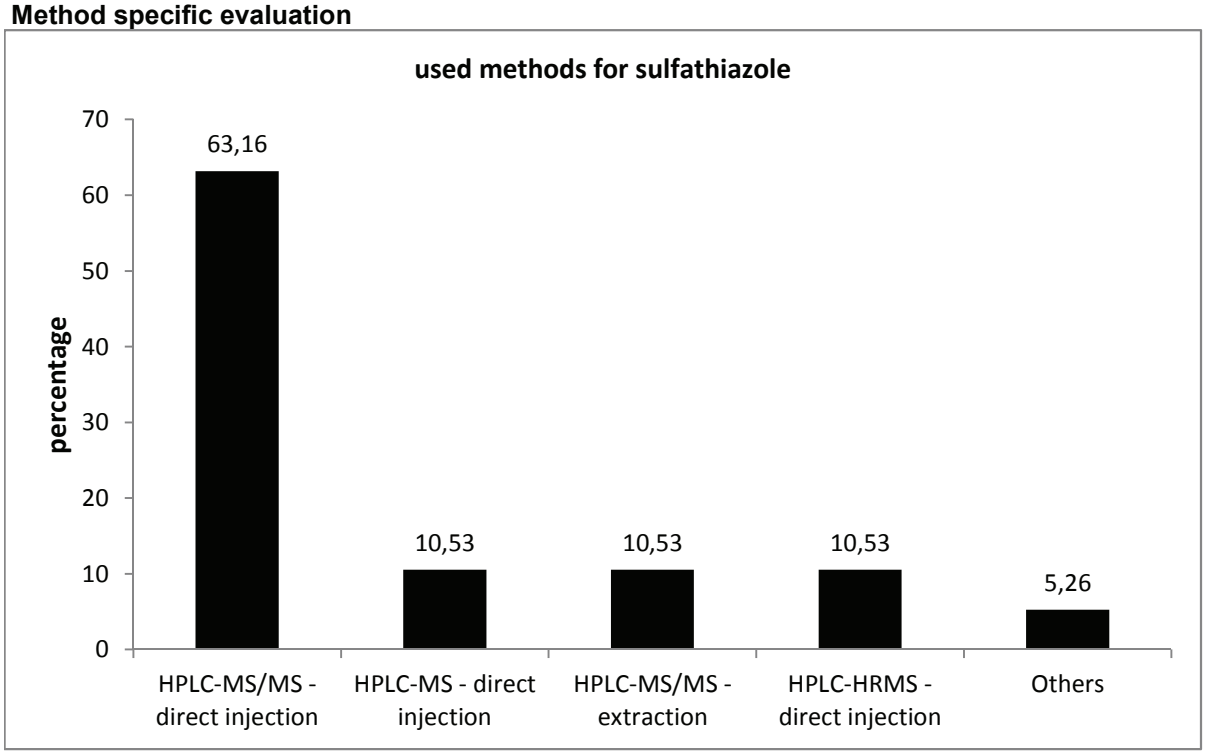
**Relative standard deviation and tolerance limits**

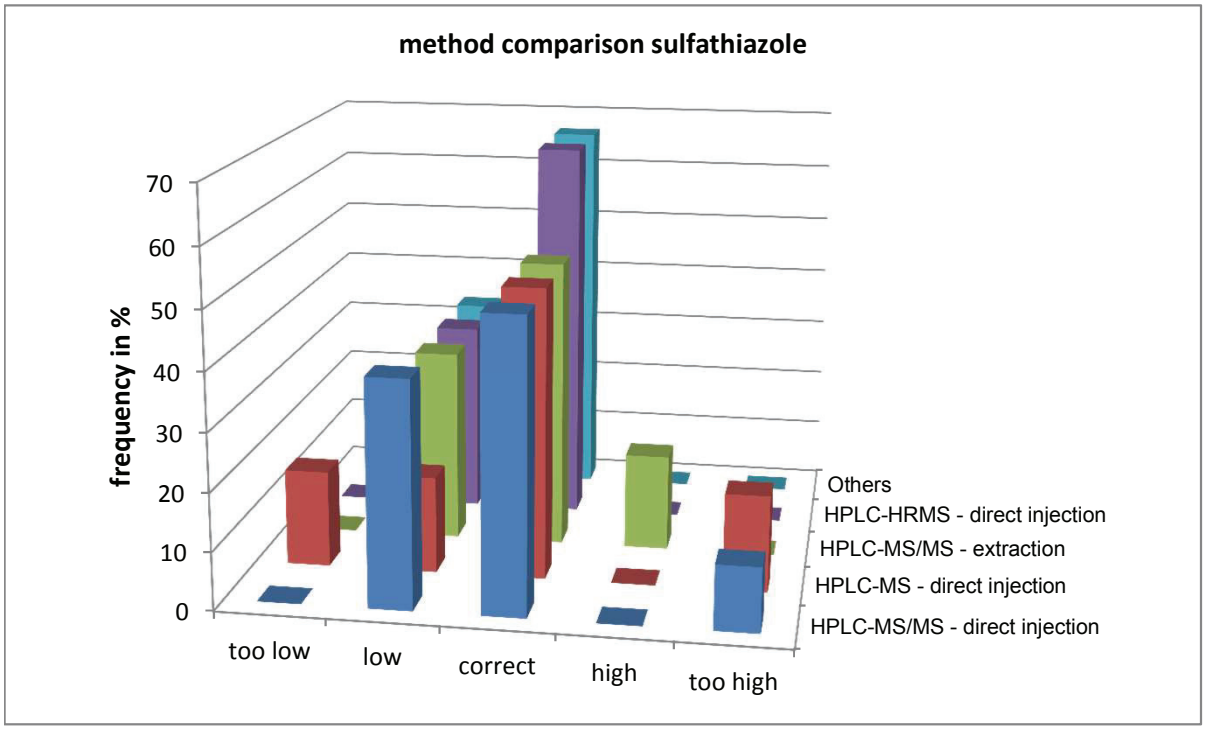



The relative standard deviations, calculated with the Q-method, did not reach the limits.



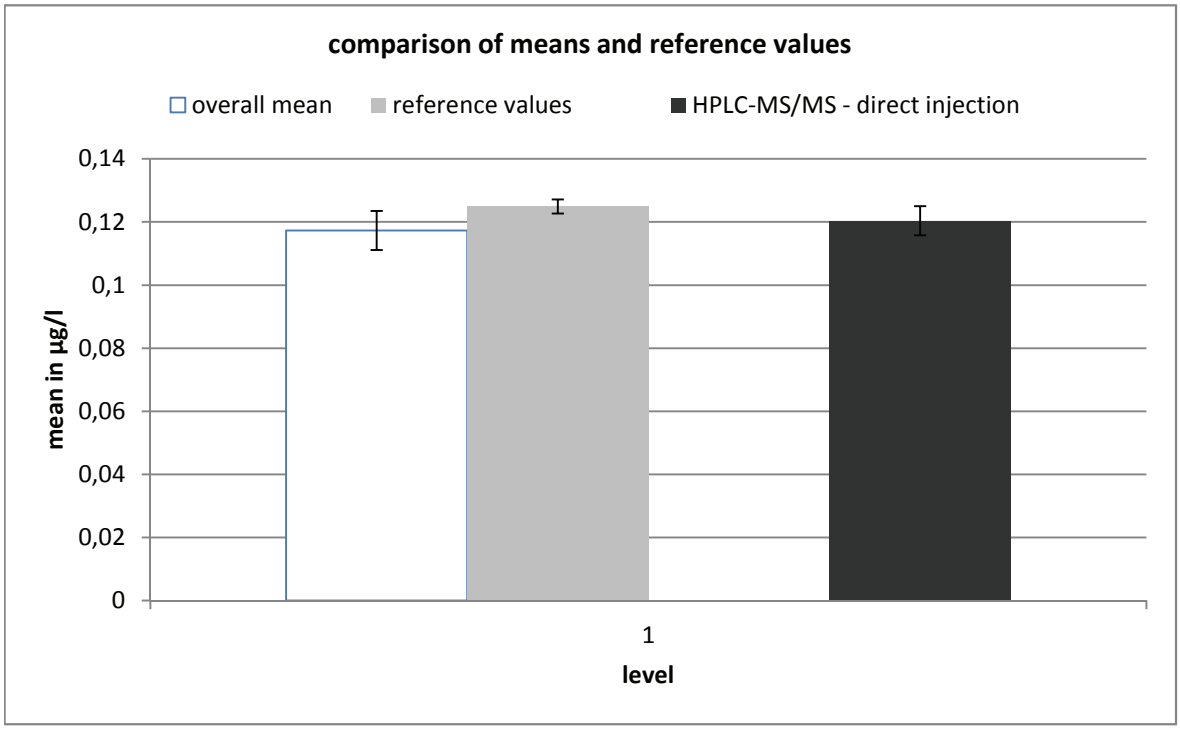
**Method specific evaluation**

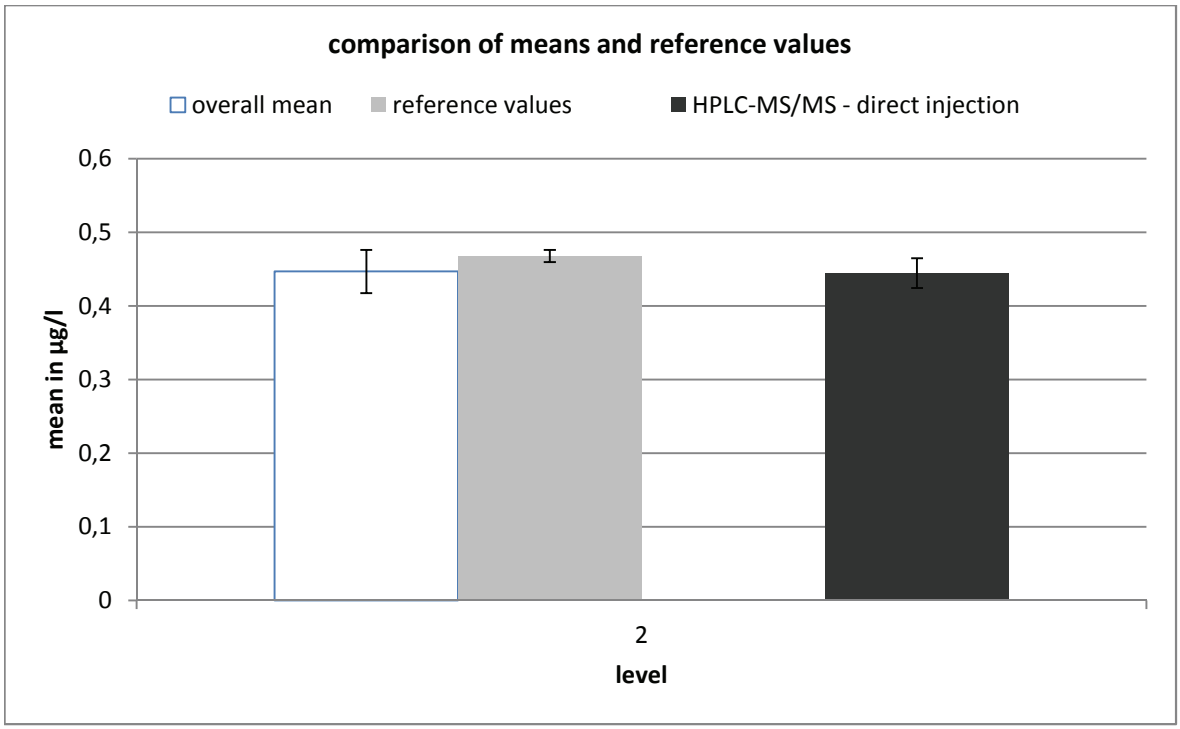


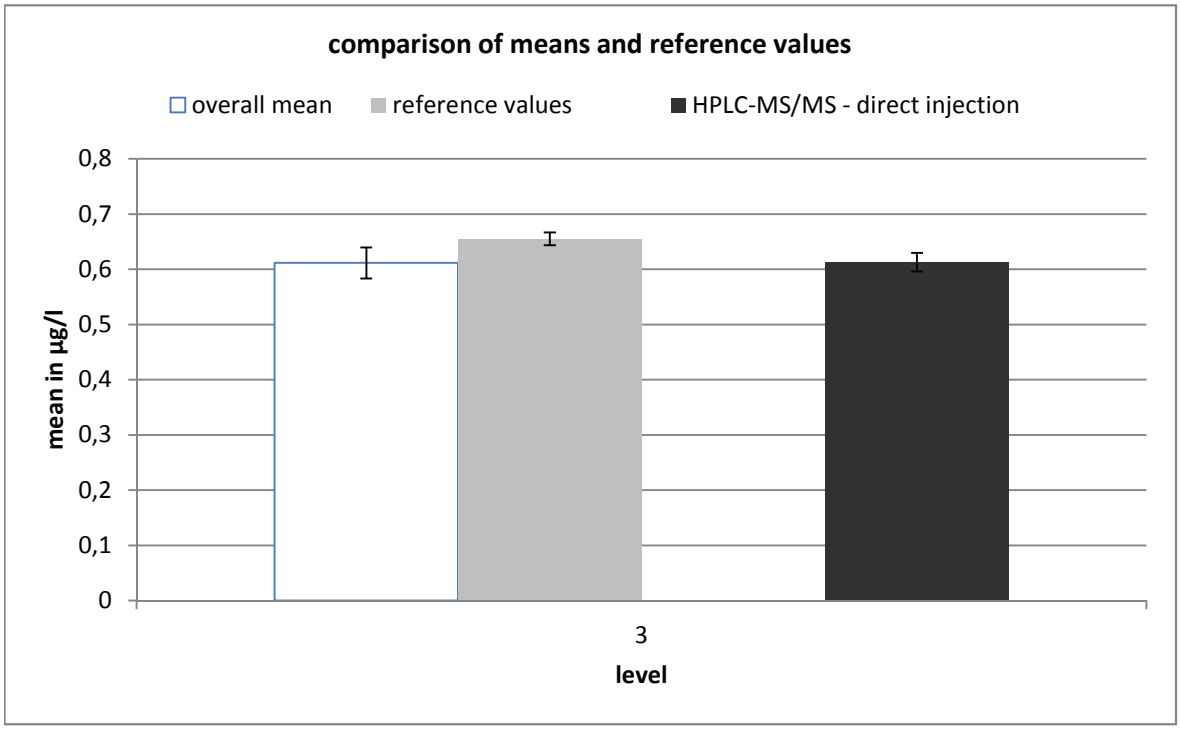



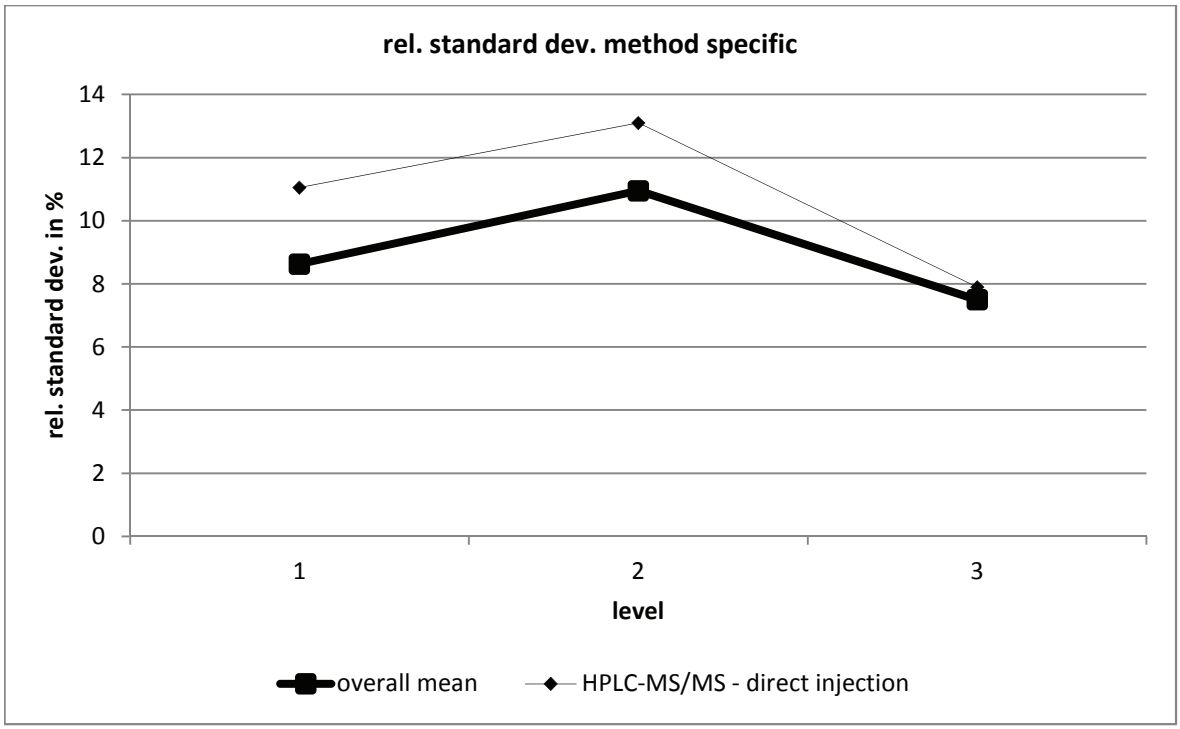
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1173 | 0,0062 | 5,3 | 0,1249 | 0,0022 | 1,8 |
| 2 | 0,4470 | 0,0294 | 6,6 | 0,4680 | 0,0084 | 1,8 |
| 3 | 0,6114 | 0,0282 | 4,6 | 0,6551 | 0,0117 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

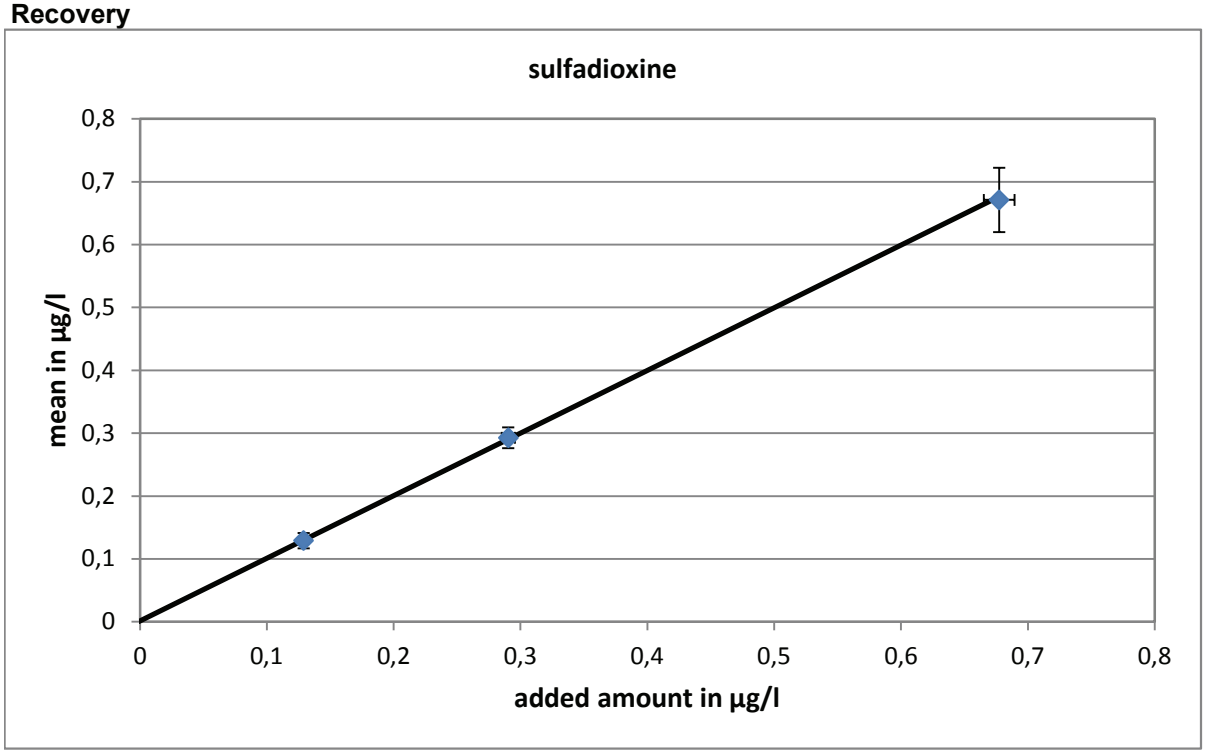



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,12 | 0,005 | 3,831 | 0,013 | 11,05 | 13 | 0 | 3 | 23,08 |
| 2 | 0,445 | 0,02 | 4,542 | 0,058 | 13,1 | 13 | 0 | 2 | 15,38 |
| 3 | 0,613 | 0,017 | 2,737 | 0,048 | 7,895 | 13 | 0 | 1 | 7,692 |

# sulfadioxine

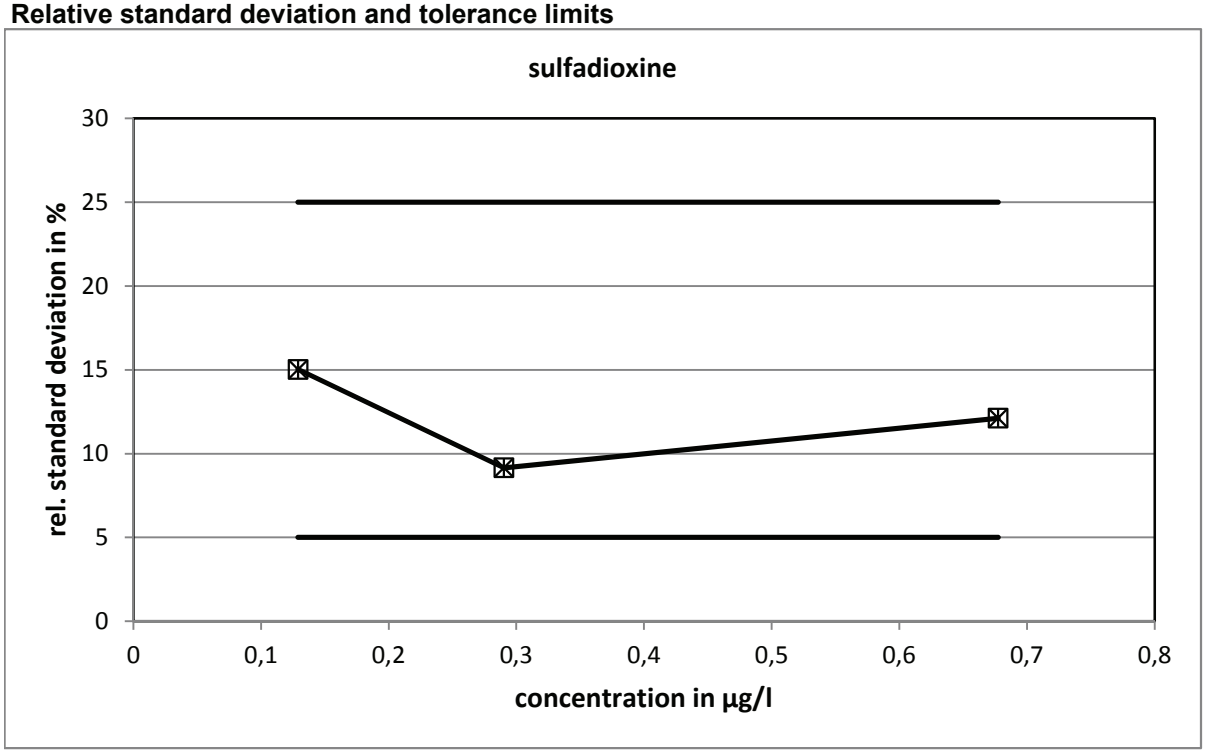
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1290 | 1,77 | 0,0194 | 0,0194 | 15,03 | 0,1712 | 0,0927 | 32,66 | -28,12 | 16 | 0 | 1 | 6,3 |
| 2 | 0,2903 | 1,78 | 0,0266 | 0,0266 | 9,16 | 0,3461 | 0,2393 | 19,22 | -17,56 | 16 | 0 | 2 | 12,5 |
| 3 | 0,6774 | 1,78 | 0,0821 | 0,0821 | 12,12 | 0,8529 | 0,5220 | 25,91 | -22,94 | 16 | 1 | 1 | 12,5 |
| | | | | | | | | | sum | 48 | 1 | 4 | 10,4 |

**Recovery**

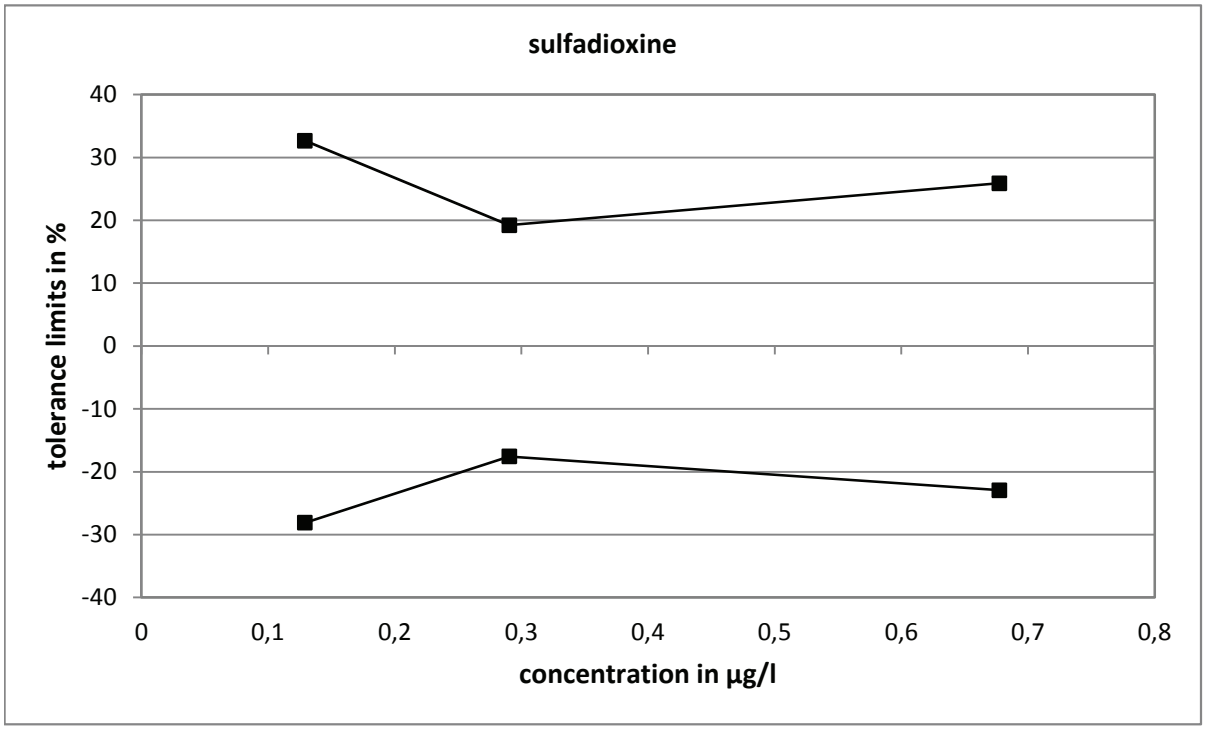



slope of the regression: 0,997
average recovery: 99,7%

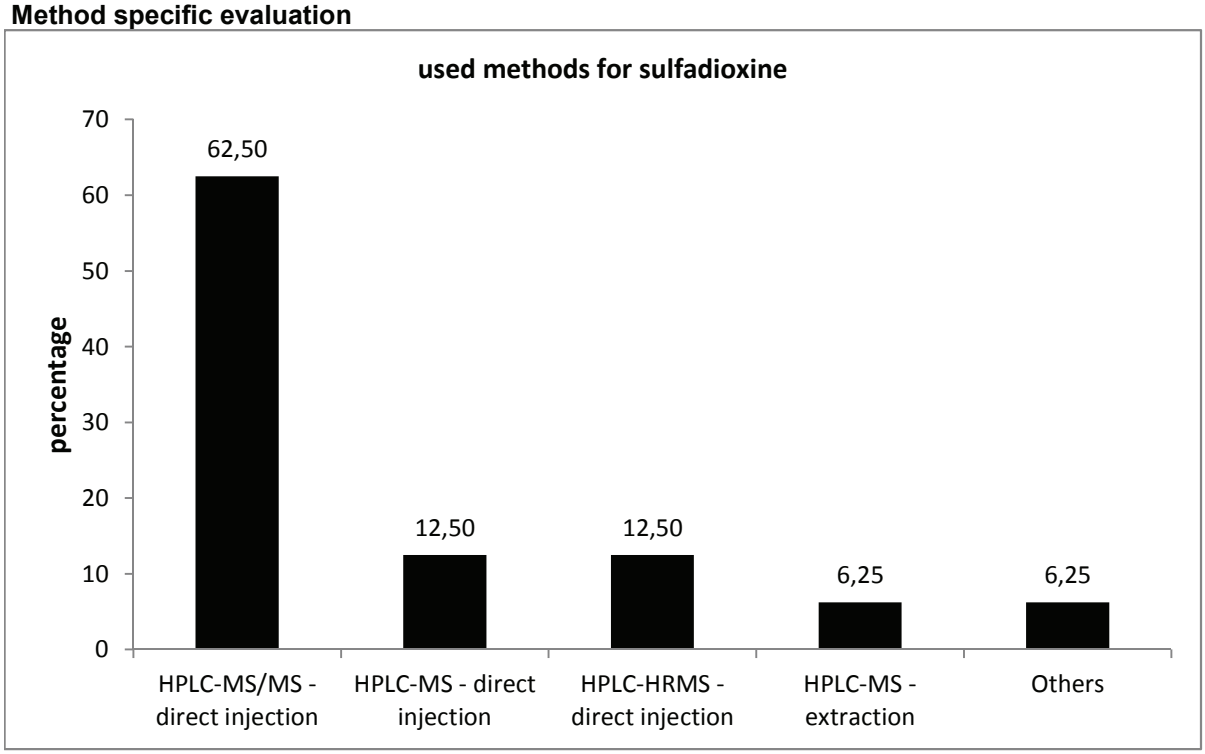
**Relative standard deviation and tolerance limits**

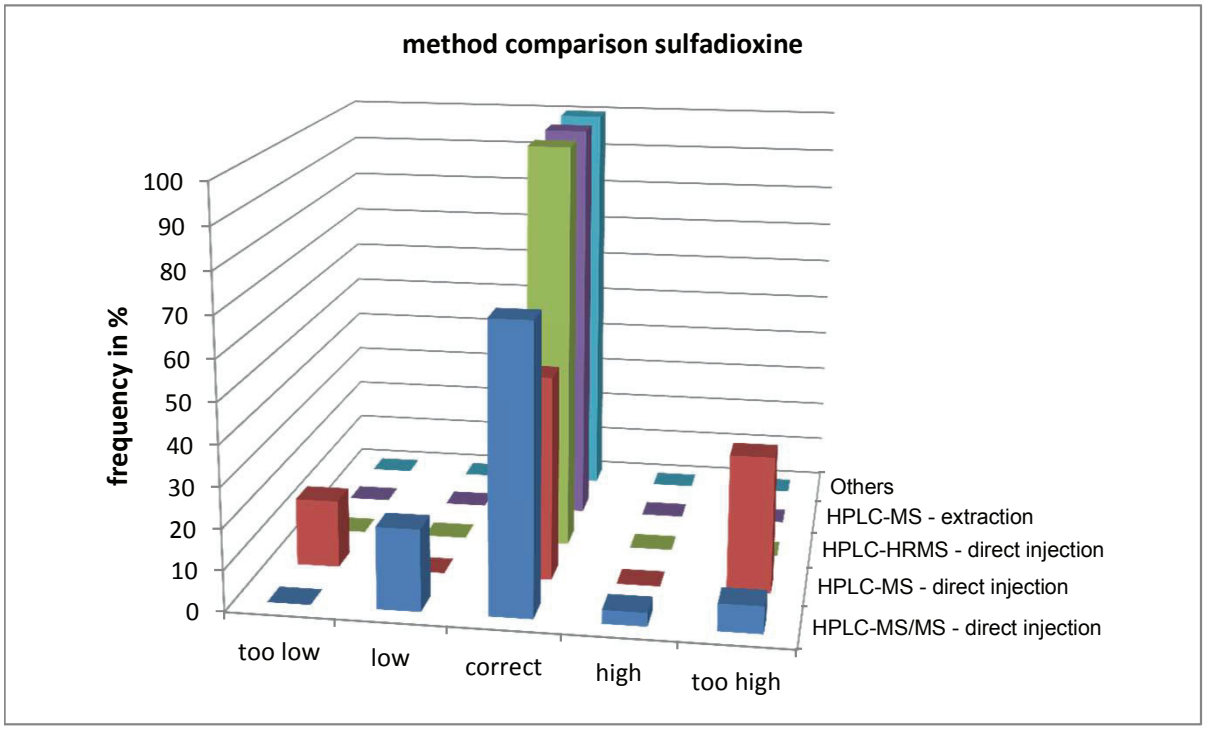



The relative standard deviations, calculated with the Q-method, did not reach the limits.



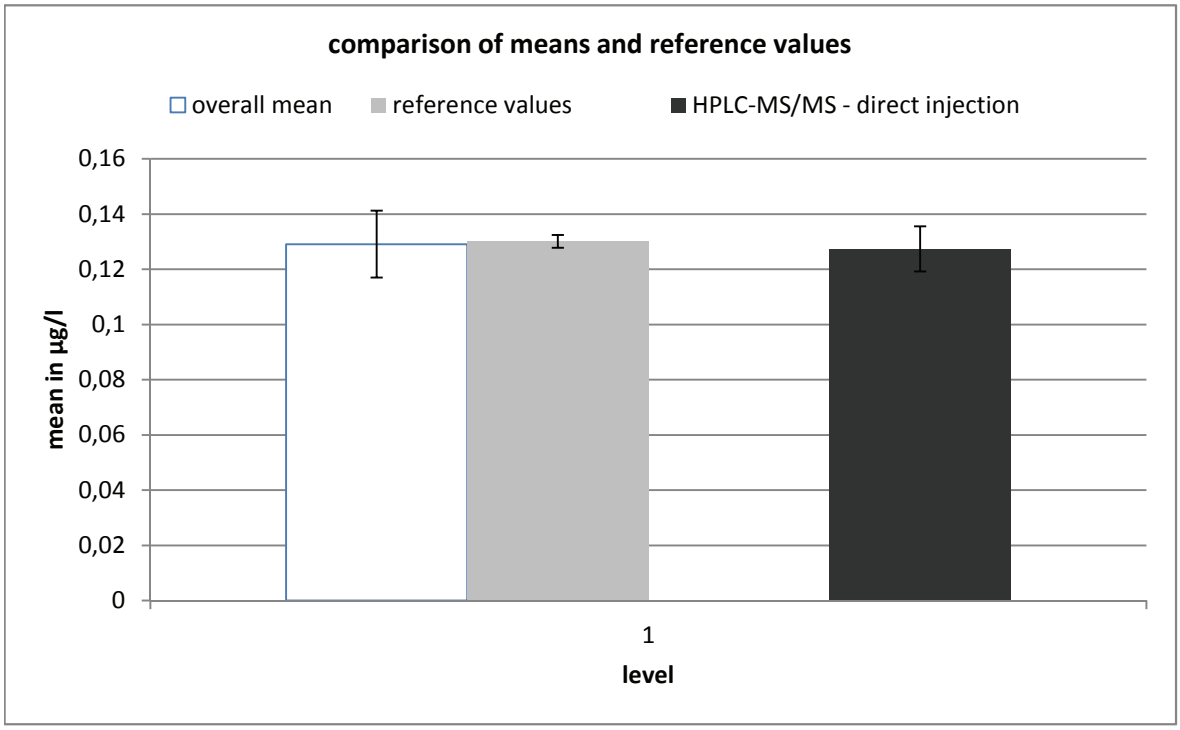
**Method specific evaluation**

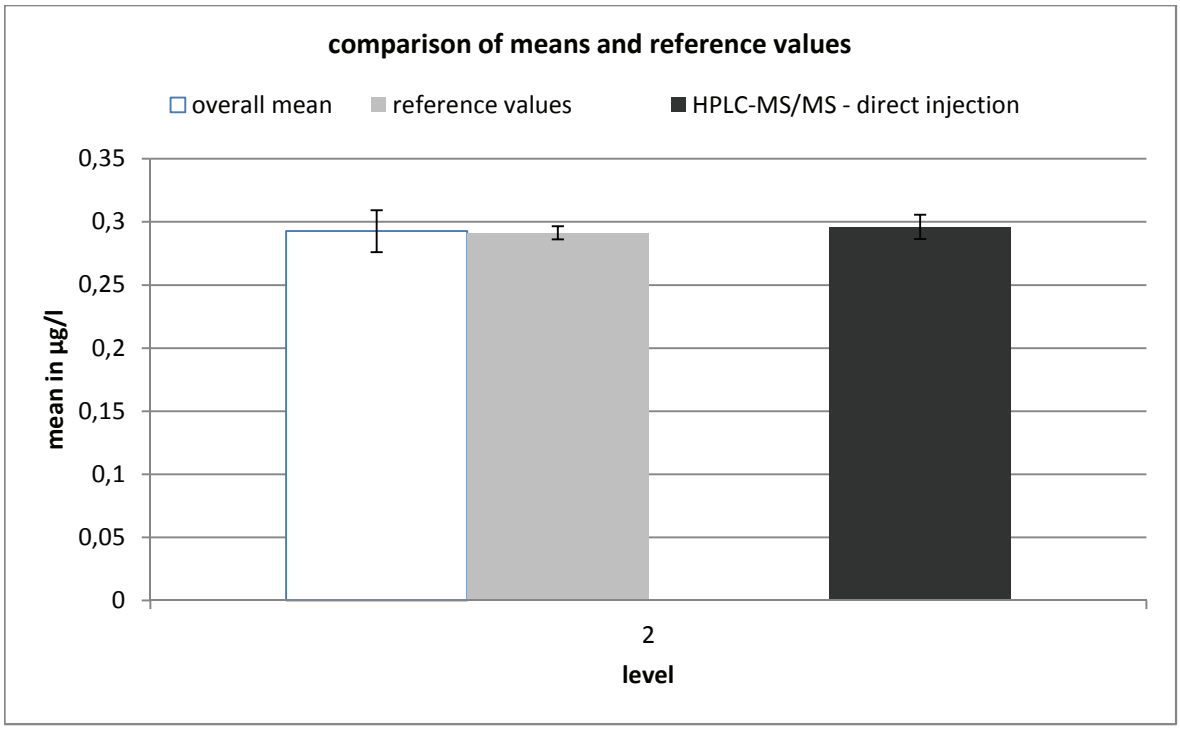


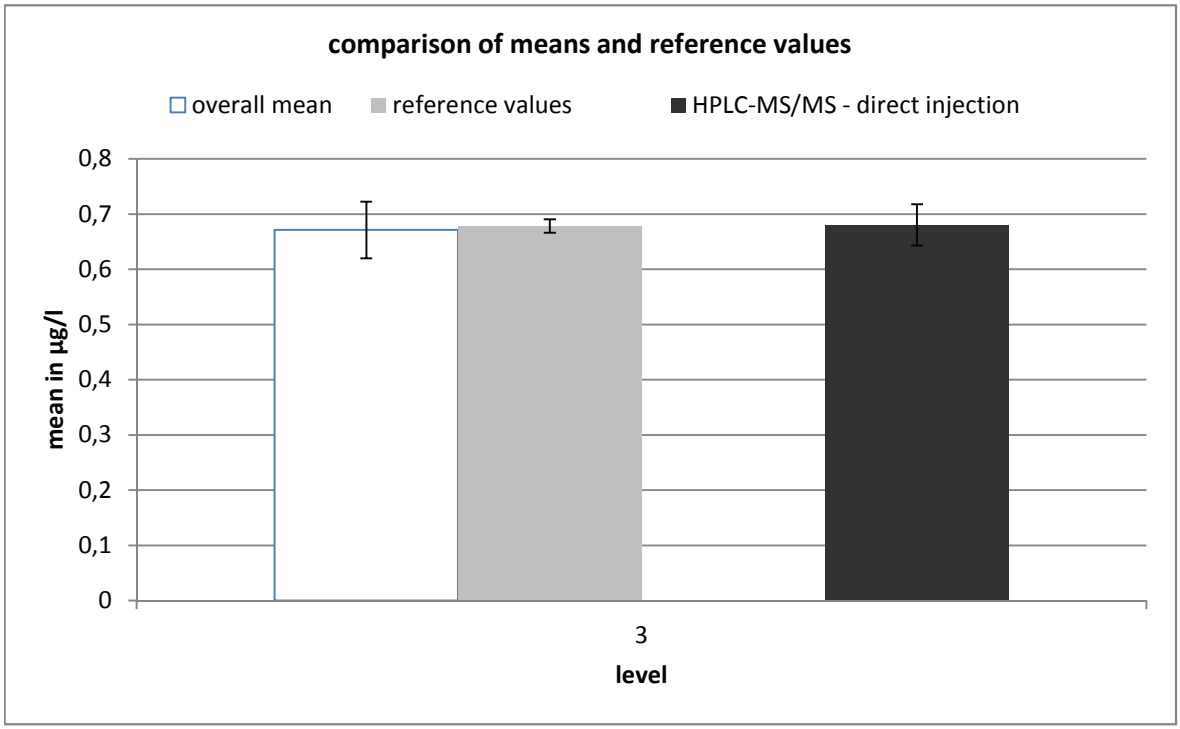



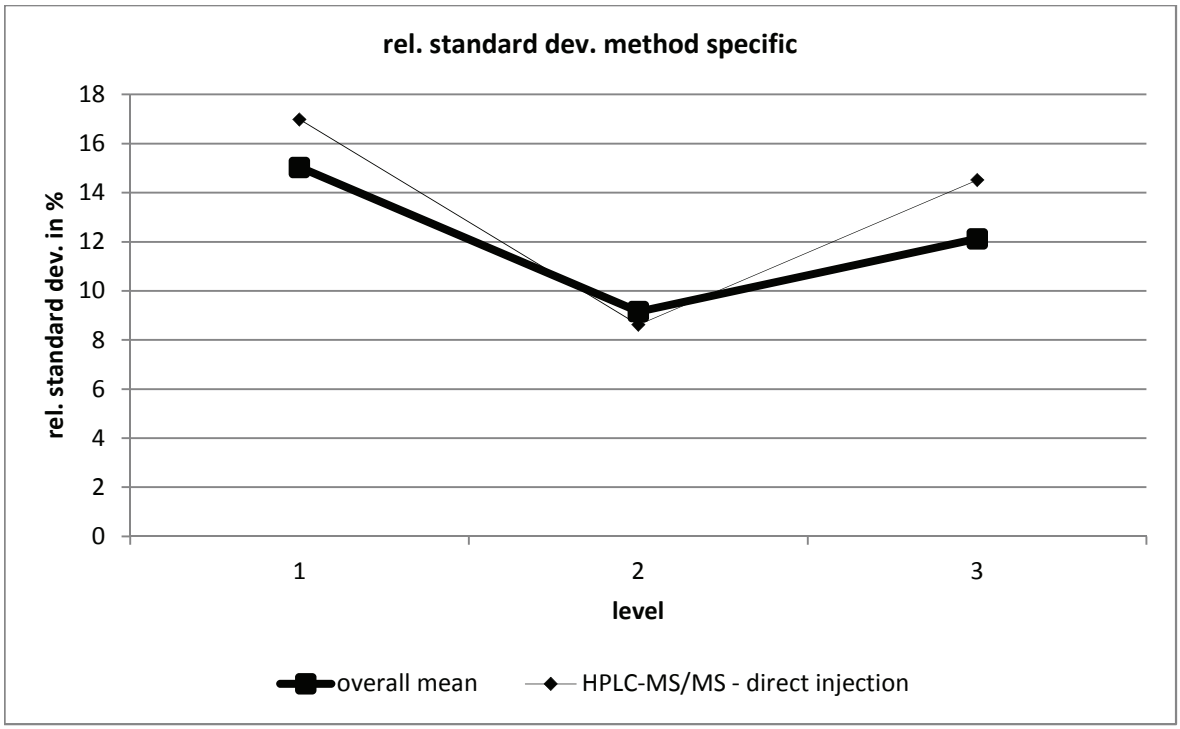
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1291 | 0,0121 | 9,4 | 0,1301 | 0,0023 | 1,8 |
| 2 | 0,2926 | 0,0166 | 5,7 | 0,2914 | 0,0052 | 1,8 |
| 3 | 0,6712 | 0,0513 | 7,6 | 0,6785 | 0,0121 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

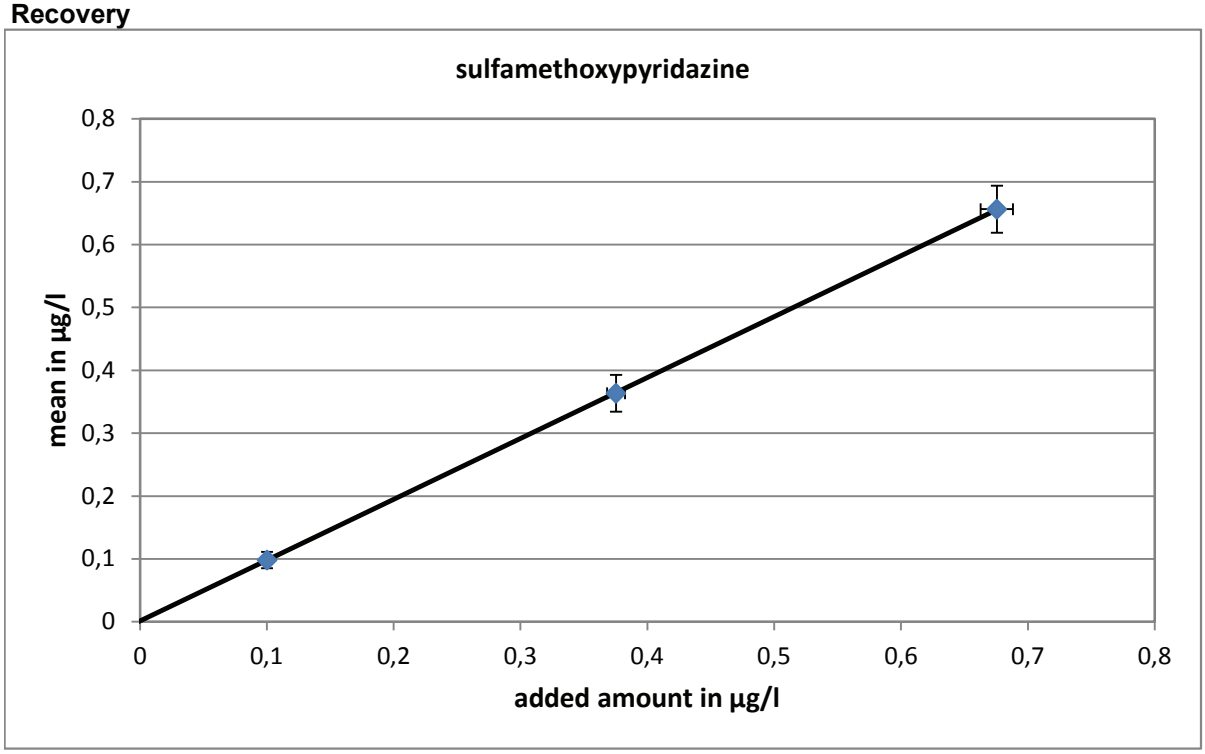



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,127 | 0,008 | 6,401 | 0,022 | 16,98 | 11 | 0 | 1 | 9,091 |
| 2 | 0,296 | 0,01 | 3,248 | 0,026 | 8,619 | 11 | 0 | 2 | 18,18 |
| 3 | 0,68 | 0,037 | 5,47 | 0,099 | 14,51 | 11 | 0 | 1 | 9,091 |

# sulfamethoxypyridazine

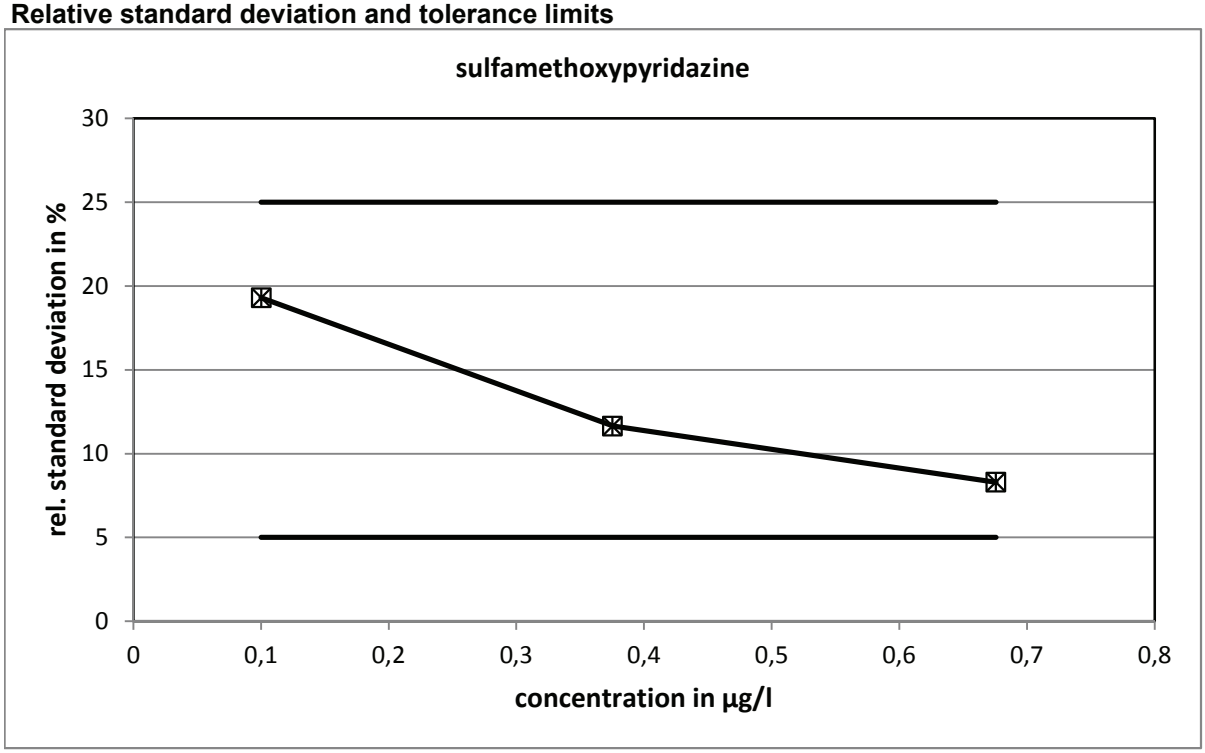
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1001 | 1,86 | 0,0193 | 0,0193 | 19,30 | 0,1433 | 0,0646 | 43,19 | -35,50 | 14 | 0 | 2 | 14,3 |
| 2 | 0,3753 | 1,87 | 0,0437 | 0,0437 | 11,65 | 0,4687 | 0,2925 | 24,87 | -22,06 | 14 | 1 | 1 | 14,3 |
| 3 | 0,6756 | 1,88 | 0,0560 | 0,0560 | 8,29 | 0,7928 | 0,5679 | 17,36 | -15,94 | 14 | 0 | 1 | 7,1 |
| | | | | | | | | | sum | 42 | 1 | 4 | 11,9 |

**Recovery**

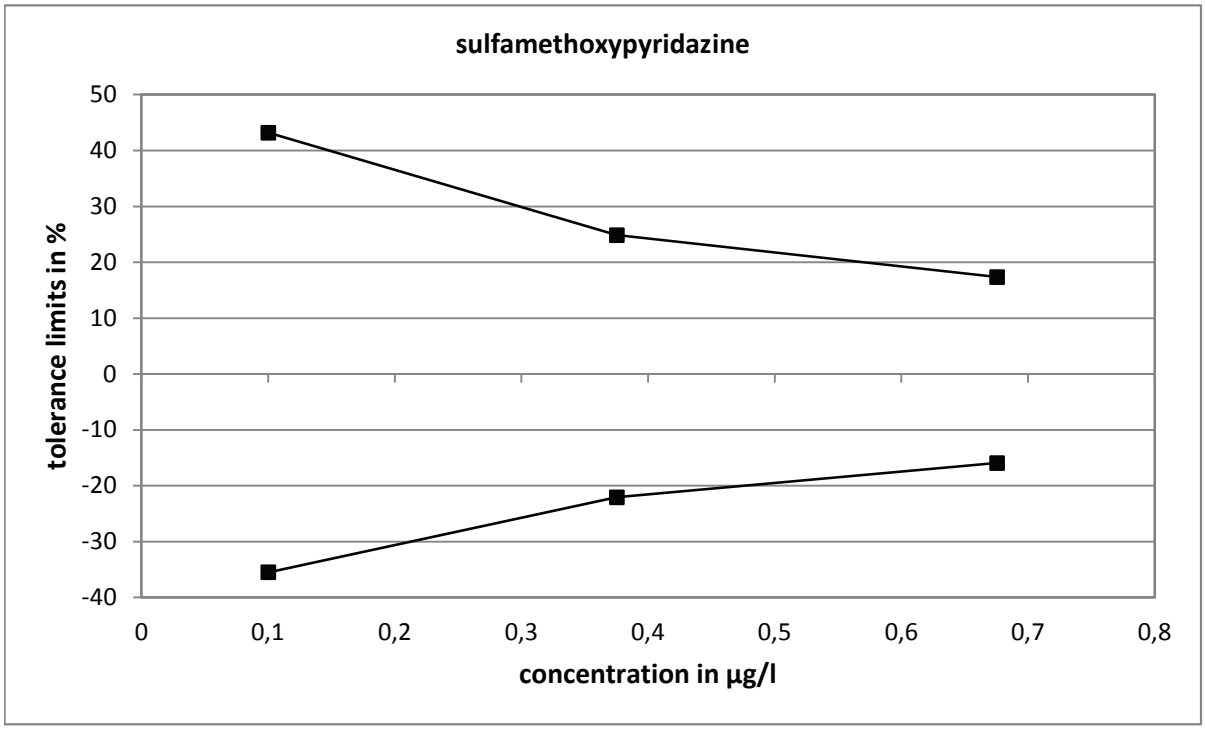



slope of the regression: 0,969
average recovery: 96,9%

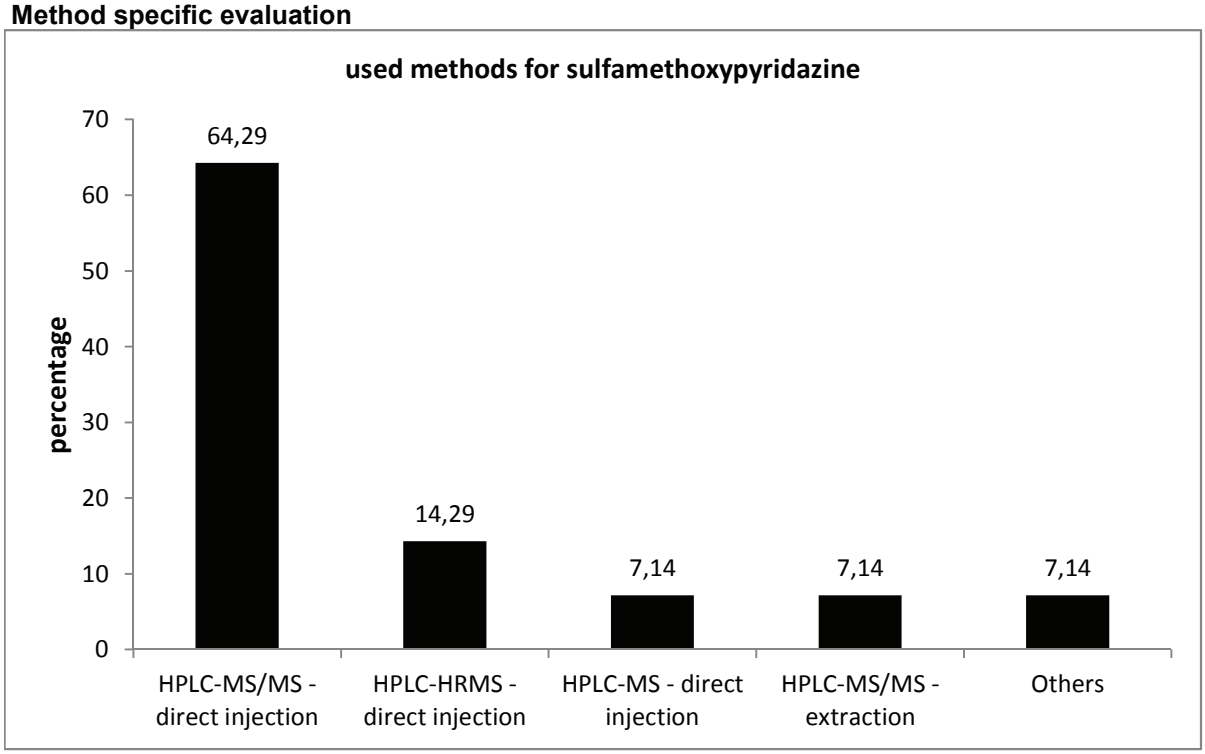
**Relative standard deviation and tolerance limits**

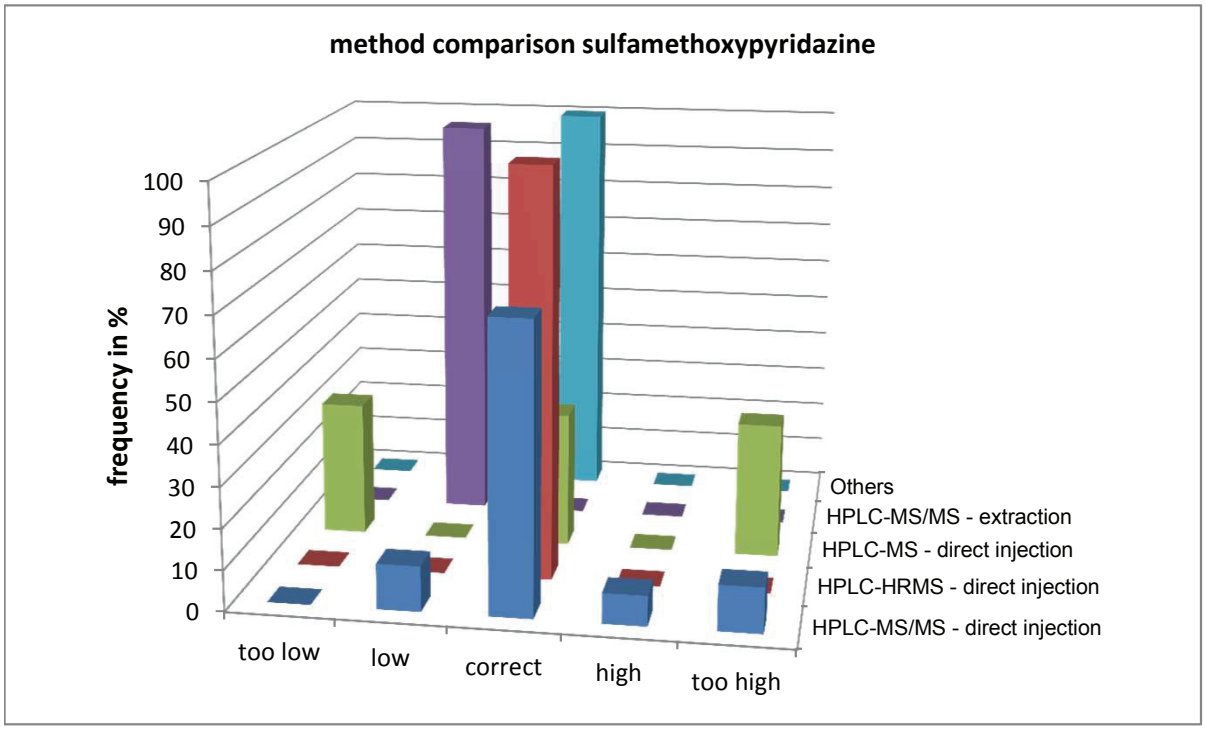



The relative standard deviations, calculated with the Q-method, did not reach the limits.



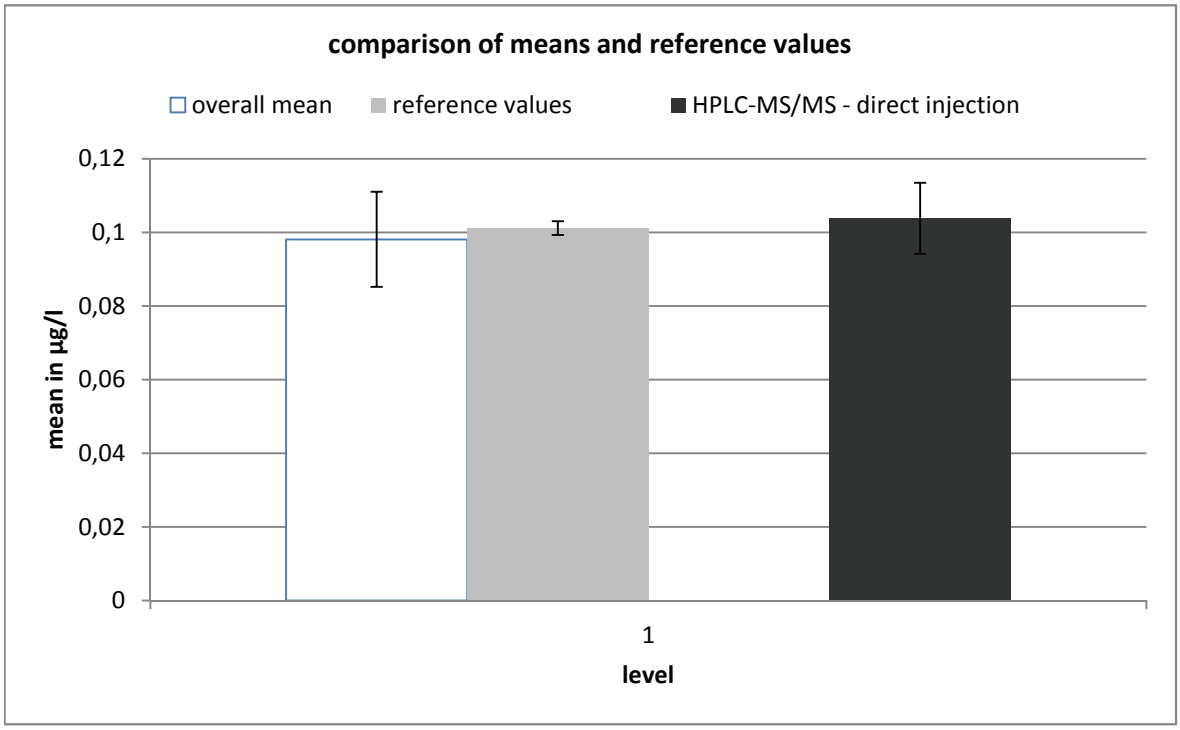
**Method specific evaluation**

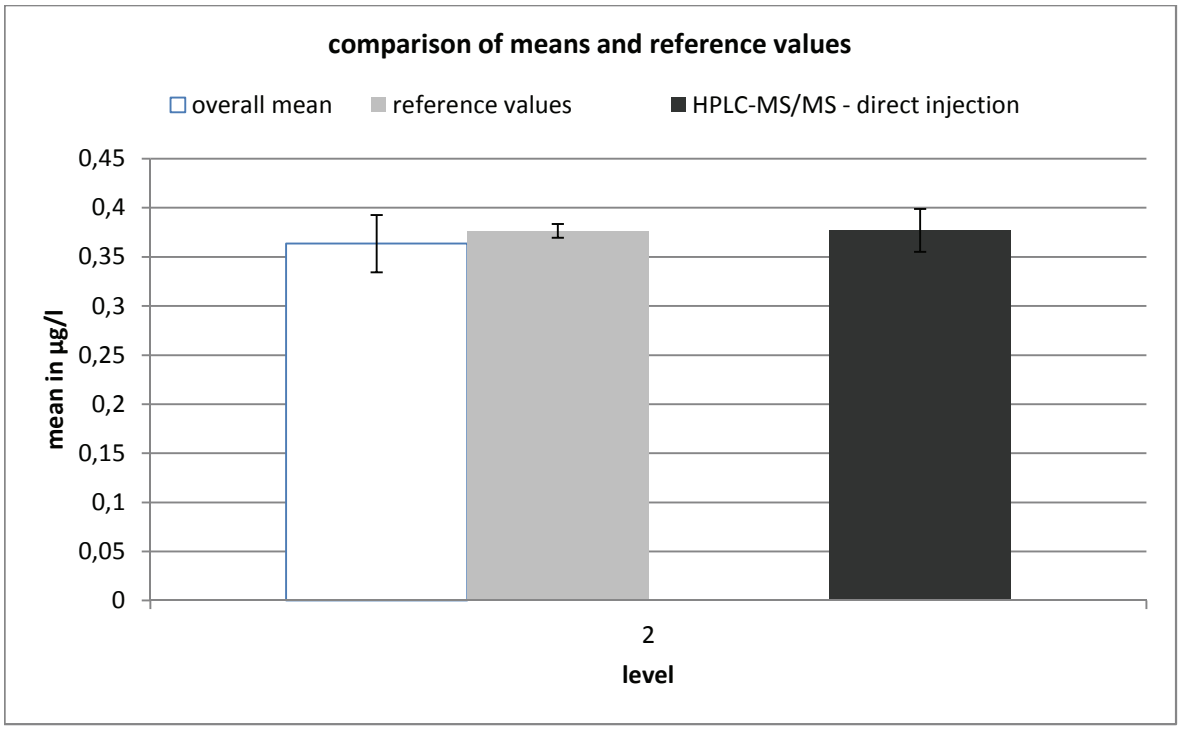


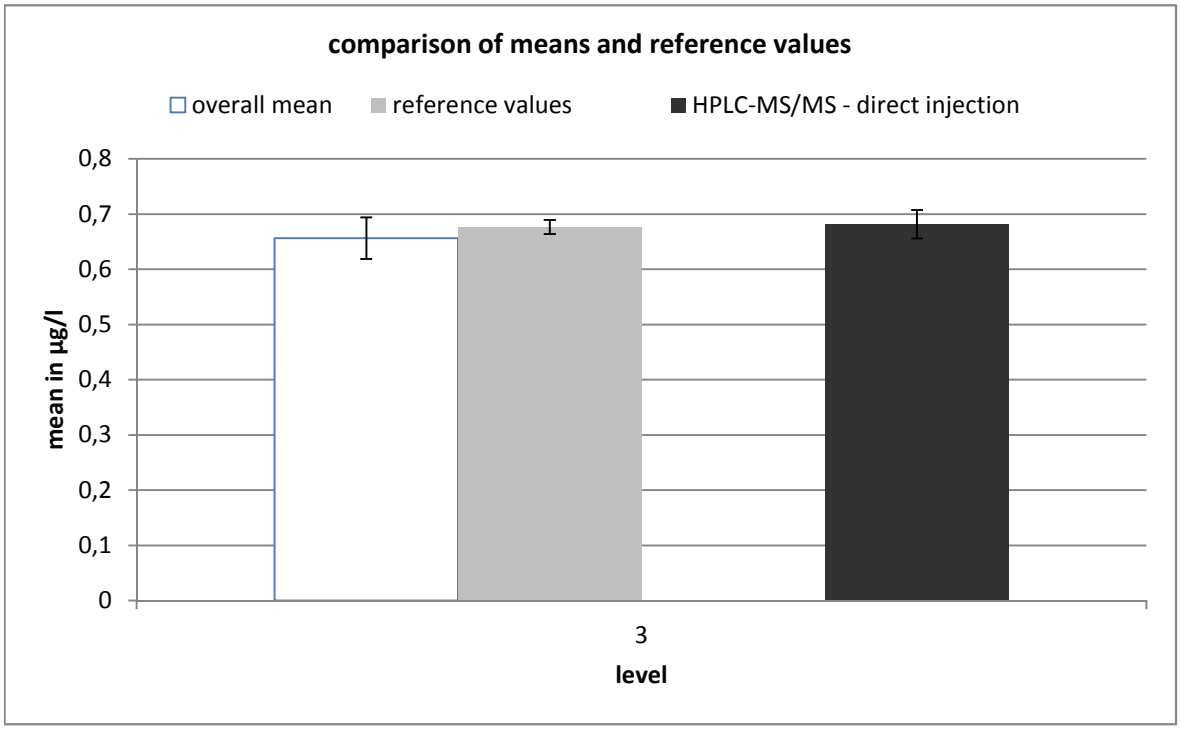



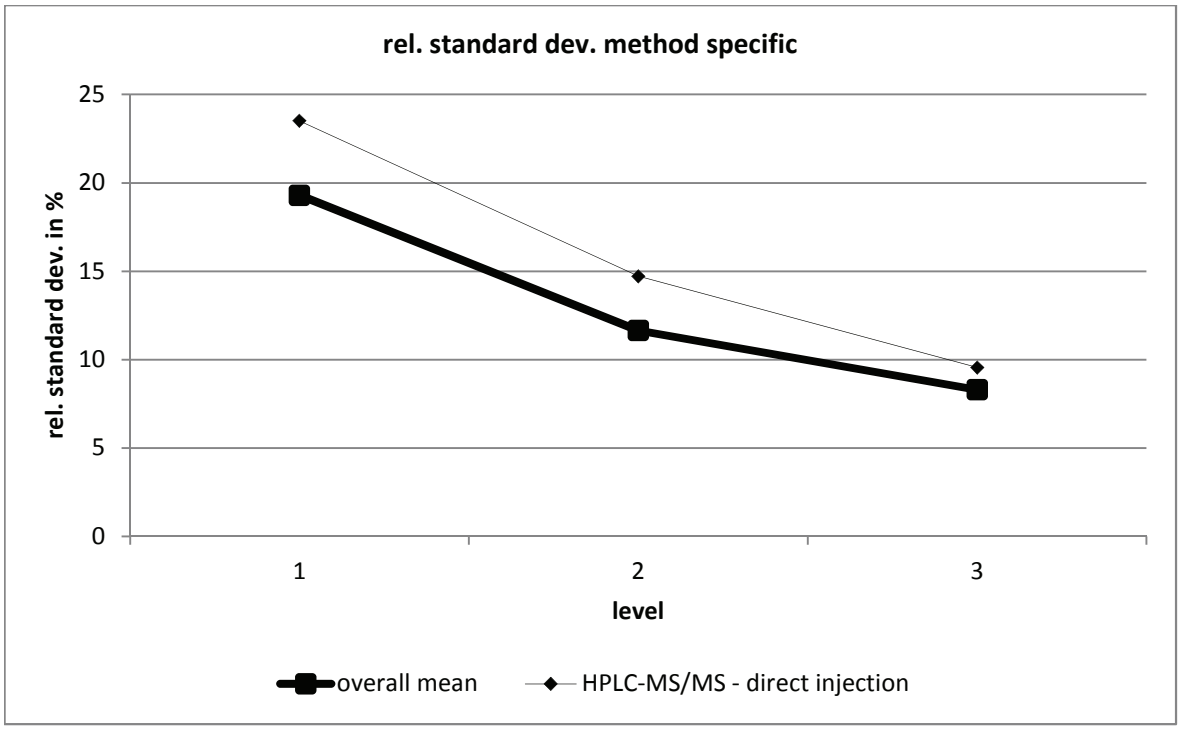
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,0981 | 0,0129 | 13,2 | 0,1012 | 0,0019 | 1,9 |
| 2 | 0,3636 | 0,0292 | 8,0 | 0,3764 | 0,0071 | 1,9 |
| 3 | 0,6564 | 0,0374 | 5,7 | 0,6767 | 0,0127 | 1,9 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

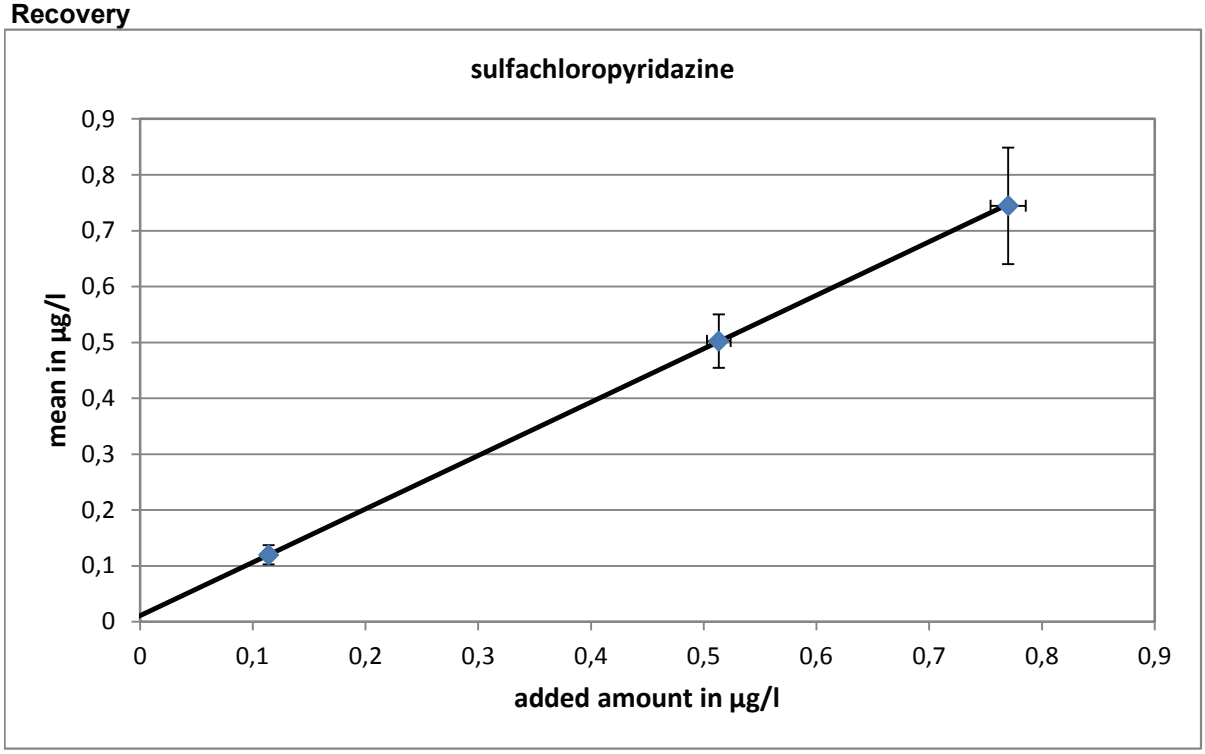



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,104 | 0,01 | 9,295 | 0,024 | 23,51 | 10 | 0 | 1 | 10 |
| 2 | 0,377 | 0,022 | 5,817 | 0,055 | 14,71 | 10 | 0 | 1 | 10 |
| 3 | 0,681 | 0,026 | 3,776 | 0,065 | 9,552 | 10 | 0 | 1 | 10 |

# sulfachloropyridazine

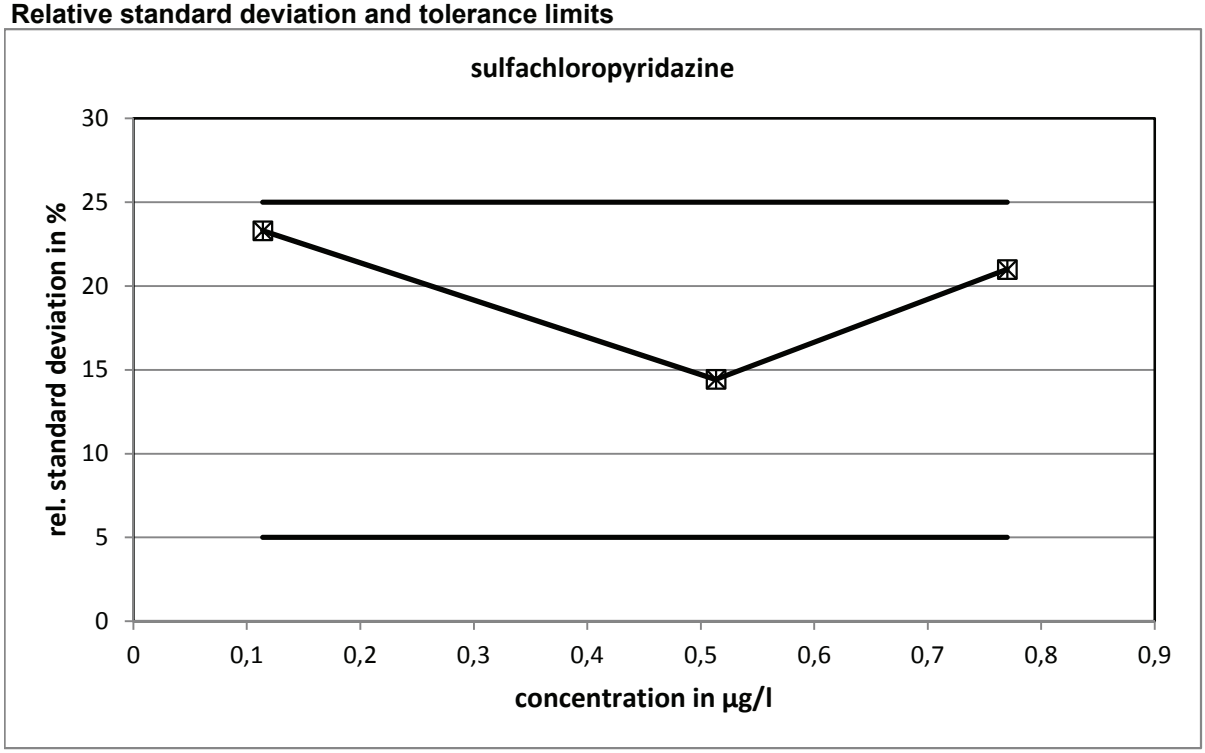
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1141 | 1,84 | 0,0266 | 0,0266 | 23,30 | 0,1746 | 0,0656 | 53,02 | -42,50 | 15 | 0 | 2 | 13,3 |
| 2 | 0,5134 | 1,98 | 0,0741 | 0,0741 | 14,43 | 0,6741 | 0,3746 | 31,31 | -27,03 | 15 | 0 | 1 | 6,7 |
| 3 | 0,7701 | 1,99 | 0,1616 | 0,1616 | 20,99 | 1,137 | 0,4748 | 47,60 | -38,34 | 15 | 1 | 1 | 13,3 |
| | | | | | | | | | sum | 45 | 1 | 4 | 11,1 |

**Recovery**

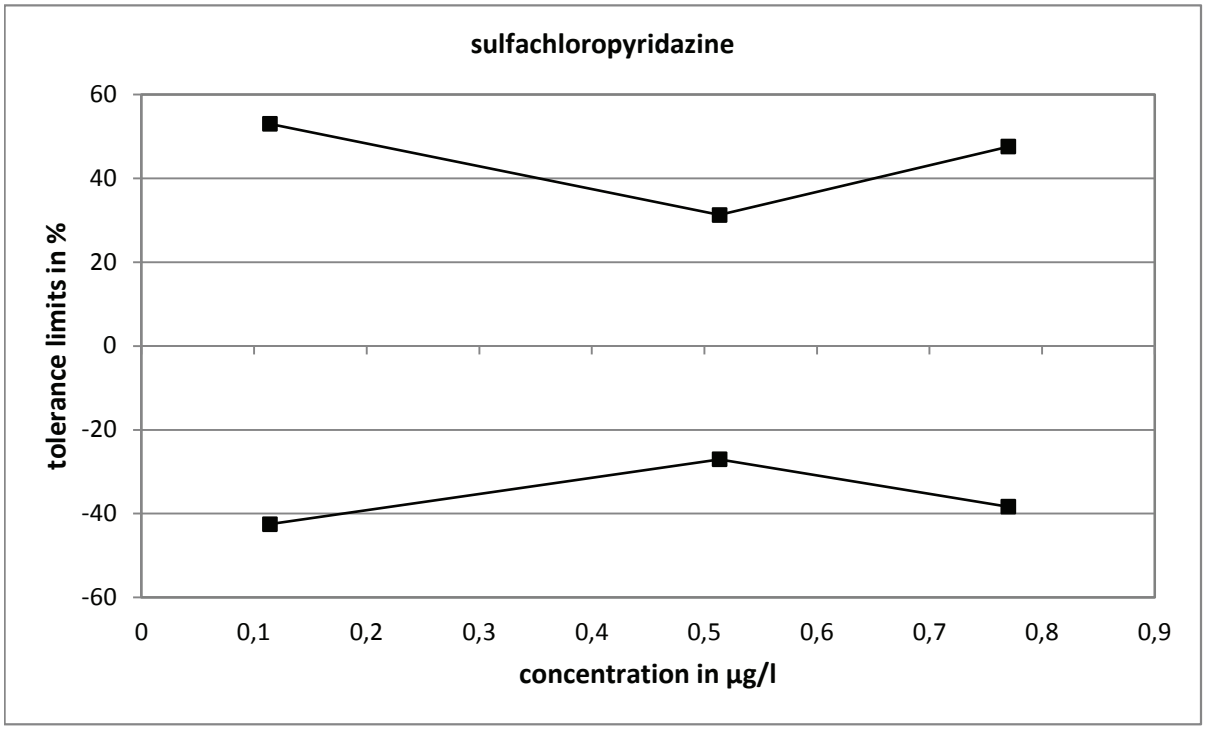



slope of the regression: 0,956
average recovery: 95,6%

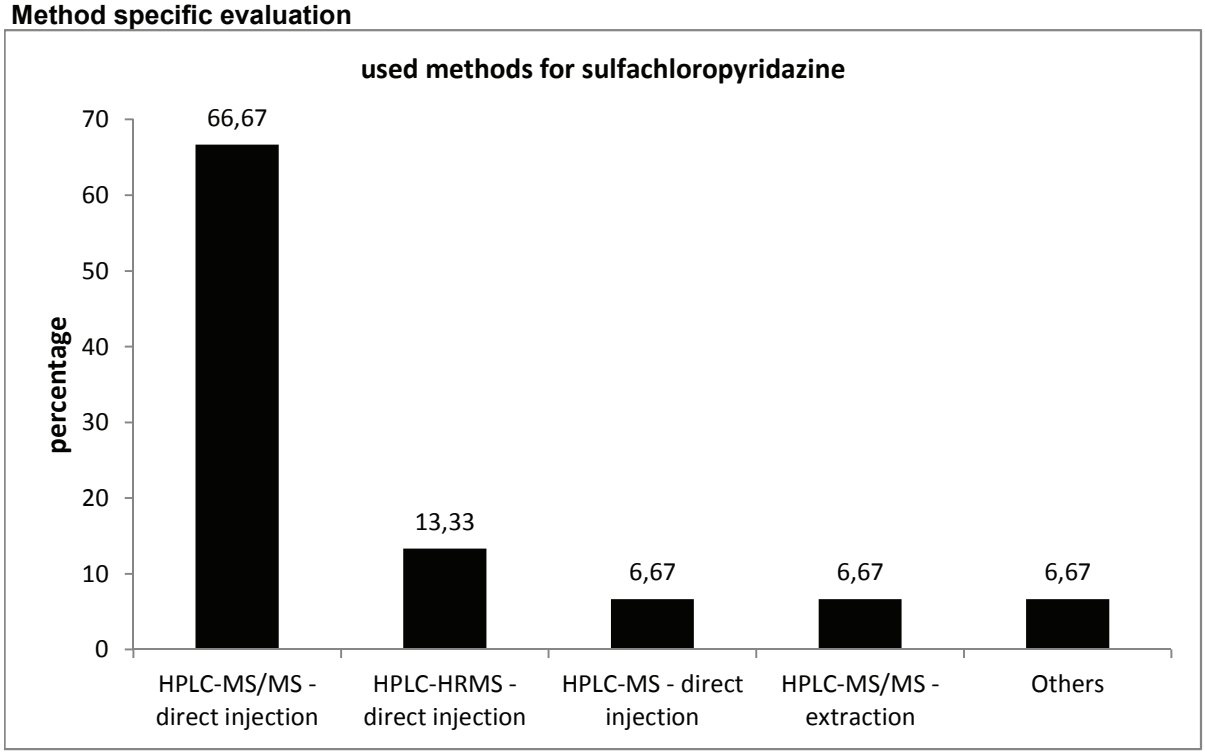
**Relative standard deviation and tolerance limits**

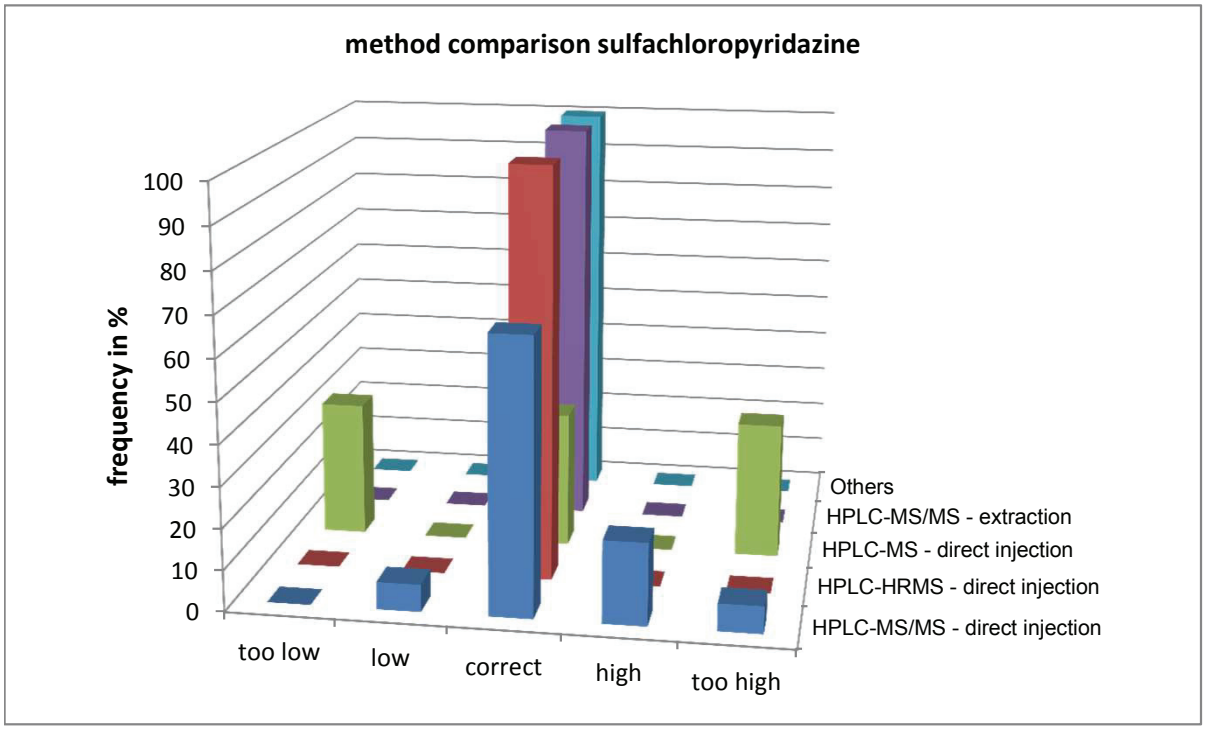



The relative standard deviations, calculated with the Q-method, did not reach the limits.



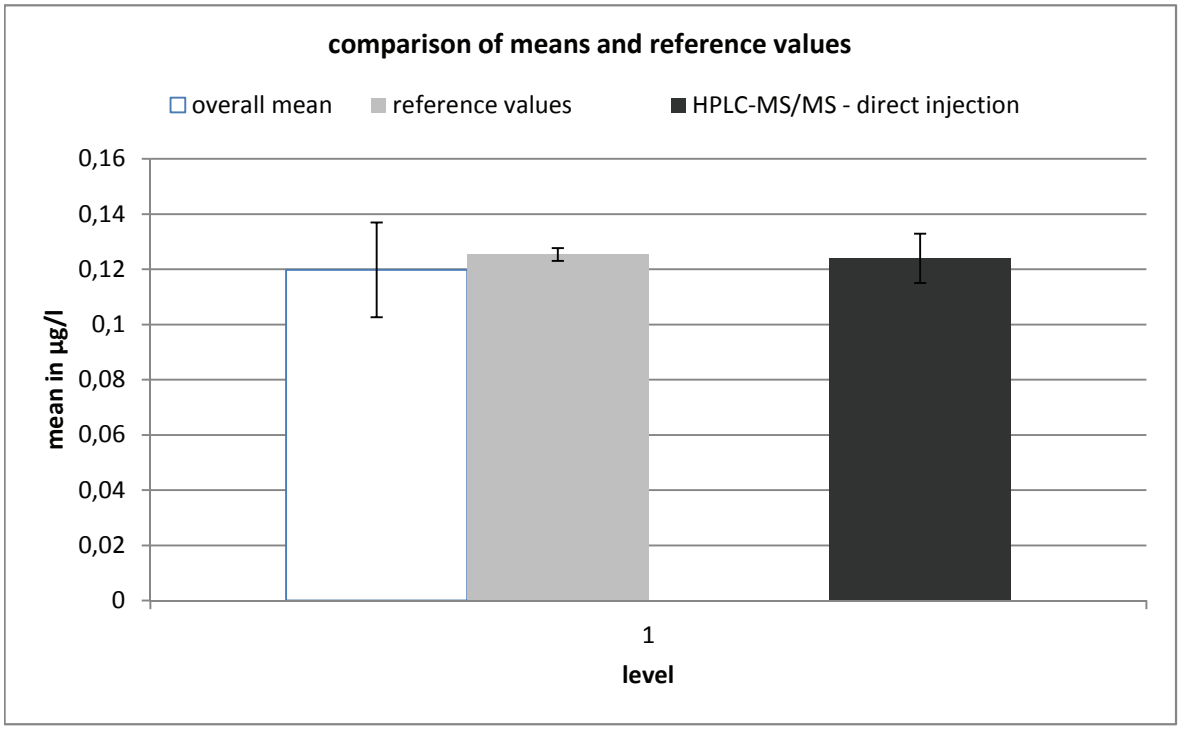
**Method specific evaluation**

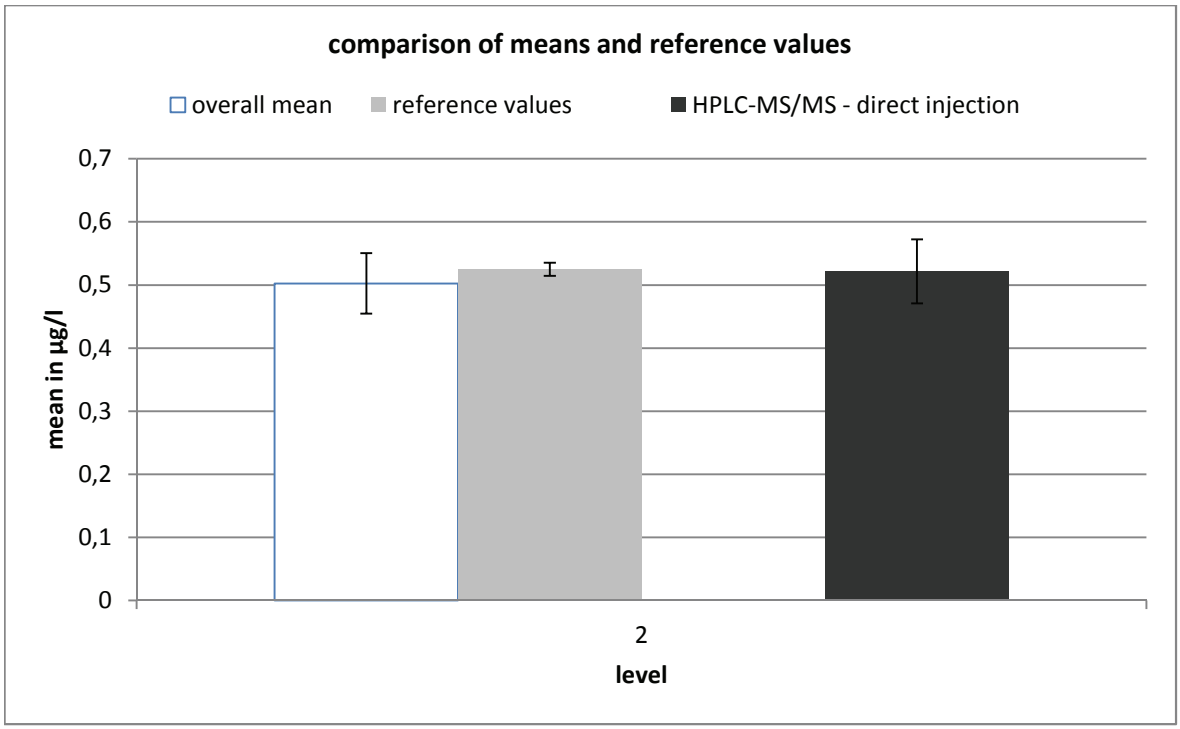


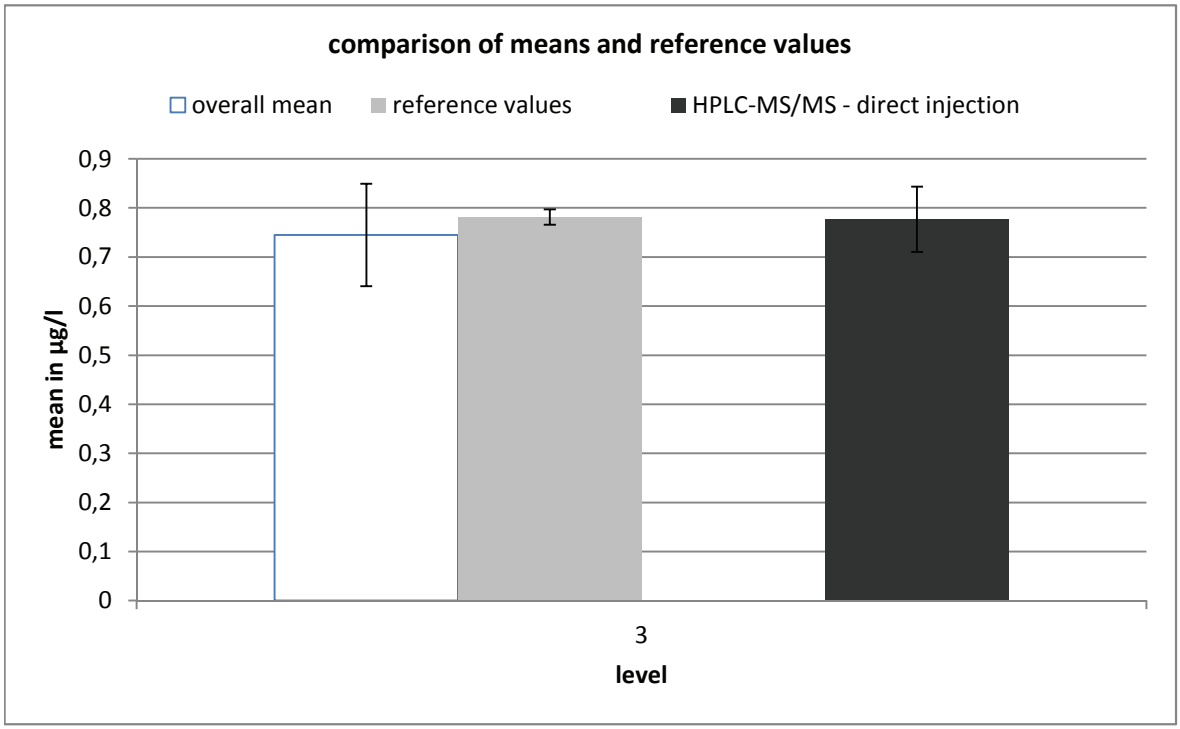



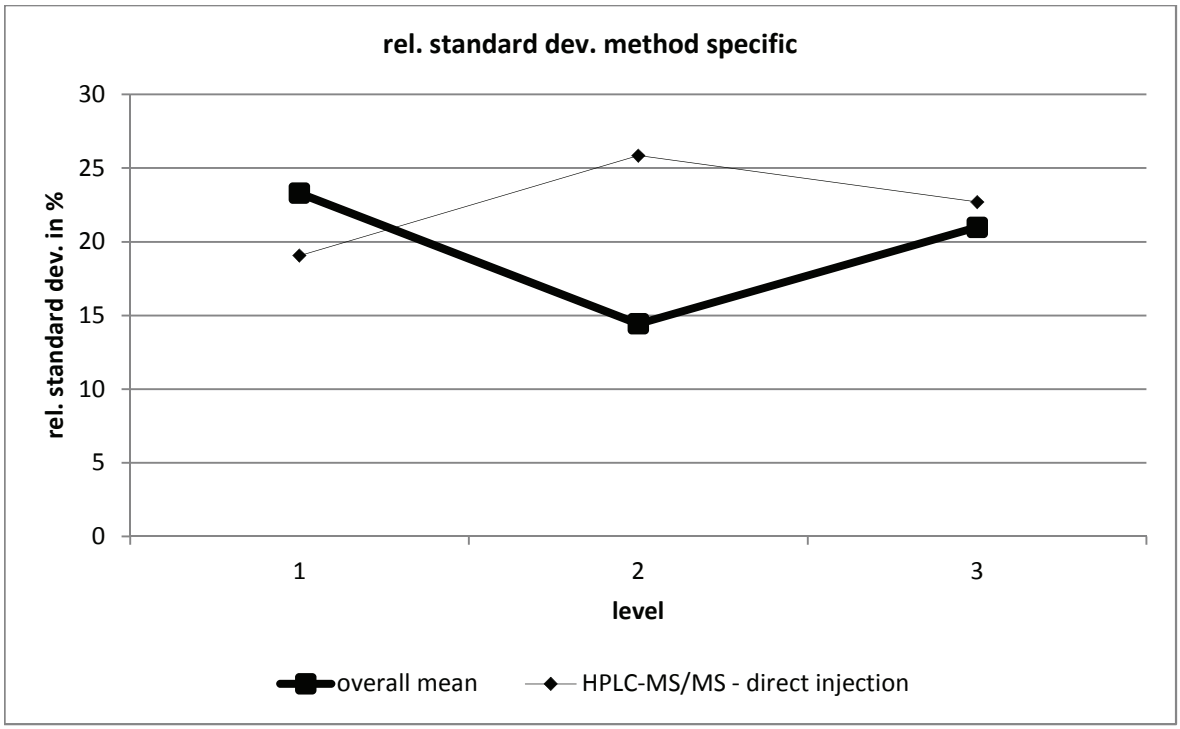
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1198 | 0,0172 | 14,3 | 0,1254 | 0,0023 | 1,8 |
| 2 | 0,5025 | 0,0478 | 9,5 | 0,5247 | 0,0104 | 2,0 |
| 3 | 0,7446 | 0,1043 | 14,0 | 0,7814 | 0,0156 | 2,0 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
mean in µg/l
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
mean in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
level

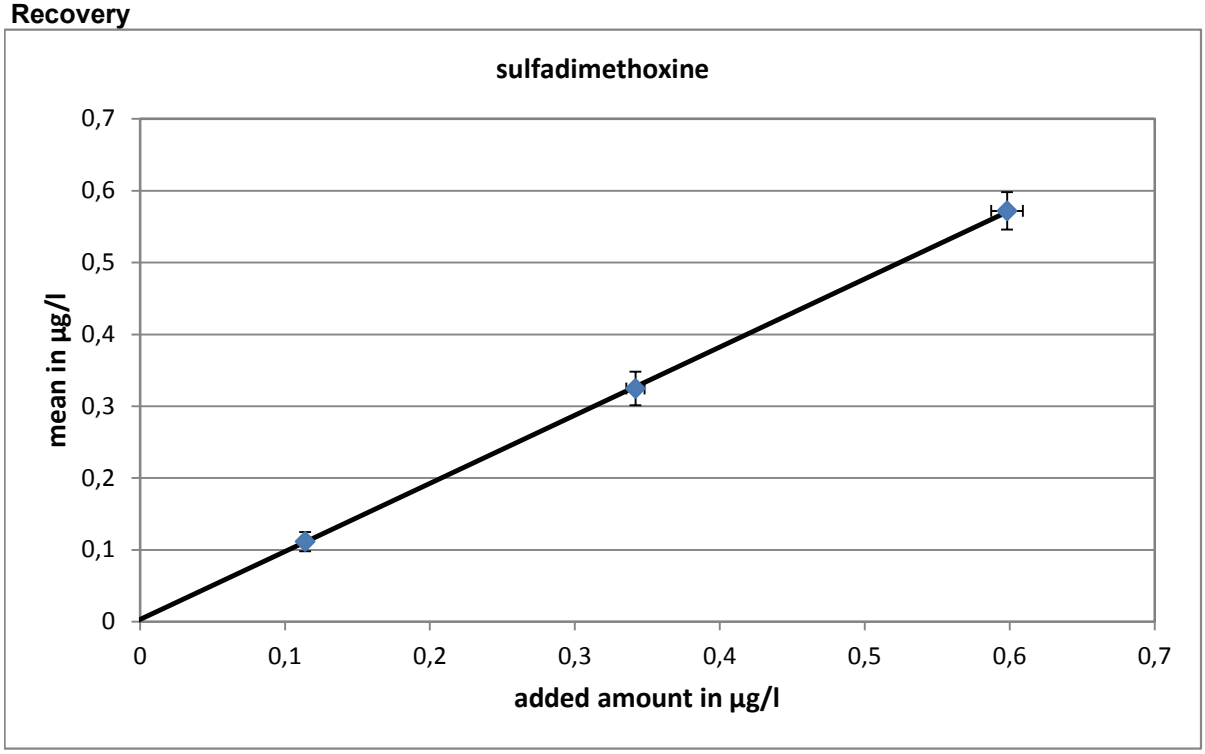



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,124 | 0,009 | 7,184 | 0,024 | 19,06 | 11 | 0 | 2 | 18,18 |
| 2 | 0,521 | 0,051 | 9,744 | 0,135 | 25,85 | 11 | 0 | 0 | 0 |
| 3 | 0,777 | 0,066 | 8,558 | 0,176 | 22,71 | 11 | 0 | 0 | 0 |

# sulfadimethoxine

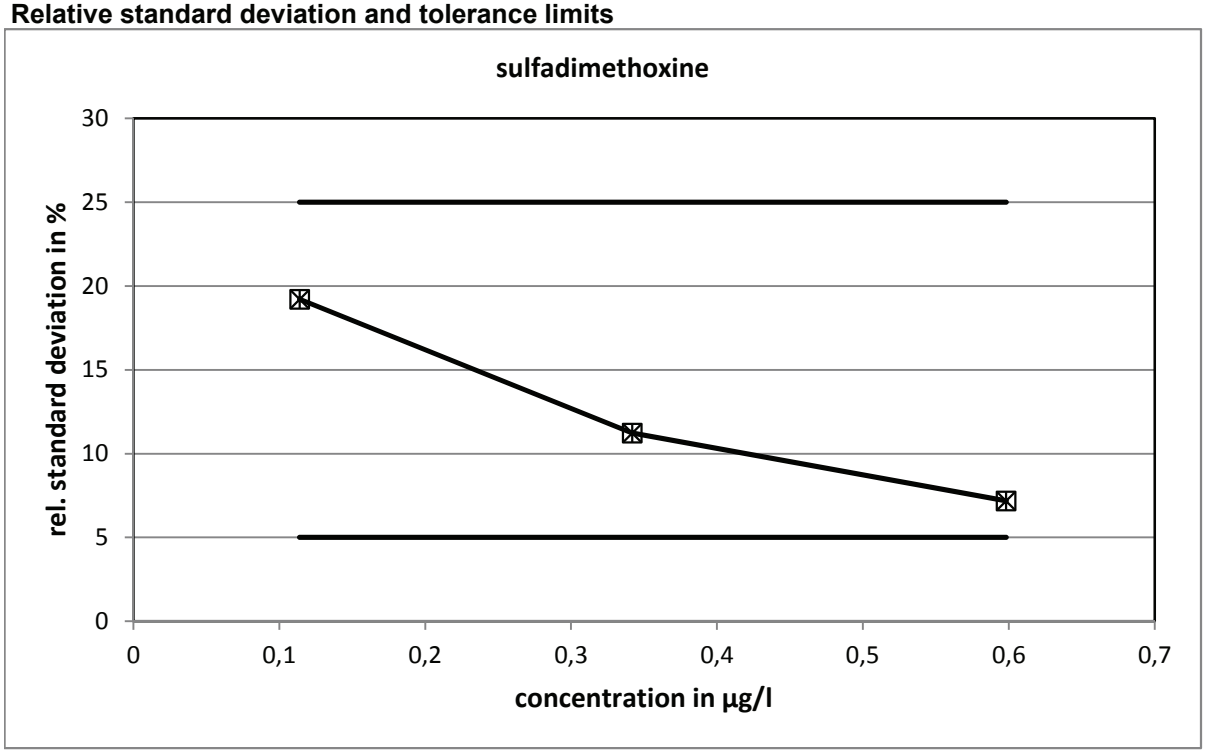
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1139 | 1,78 | 0,0219 | 0,0219 | 19,22 | 0,1629 | 0,0737 | 43,00 | -35,36 | 17 | 1 | 2 | 17,6 |
| 2 | 0,3418 | 1,81 | 0,0384 | 0,0384 | 11,23 | 0,4237 | 0,2690 | 23,96 | -21,29 | 17 | 3 | 0 | 17,6 |
| 3 | 0,5982 | 1,82 | 0,0429 | 0,0429 | 7,18 | 0,6875 | 0,5153 | 14,94 | -13,86 | 17 | 3 | 1 | 23,5 |
| | | | | | | | | | sum | 51 | 7 | 3 | 19,6 |

**Recovery**

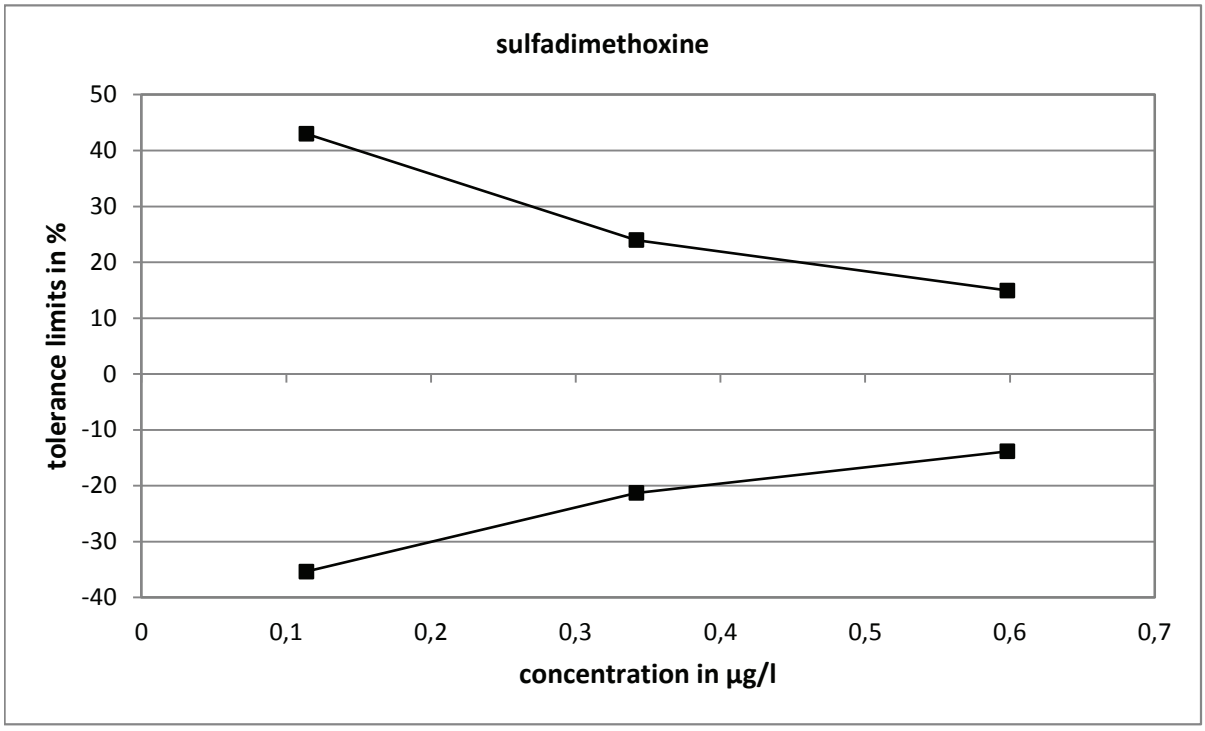



slope of the regression: 0,949
average recovery: 94,9%

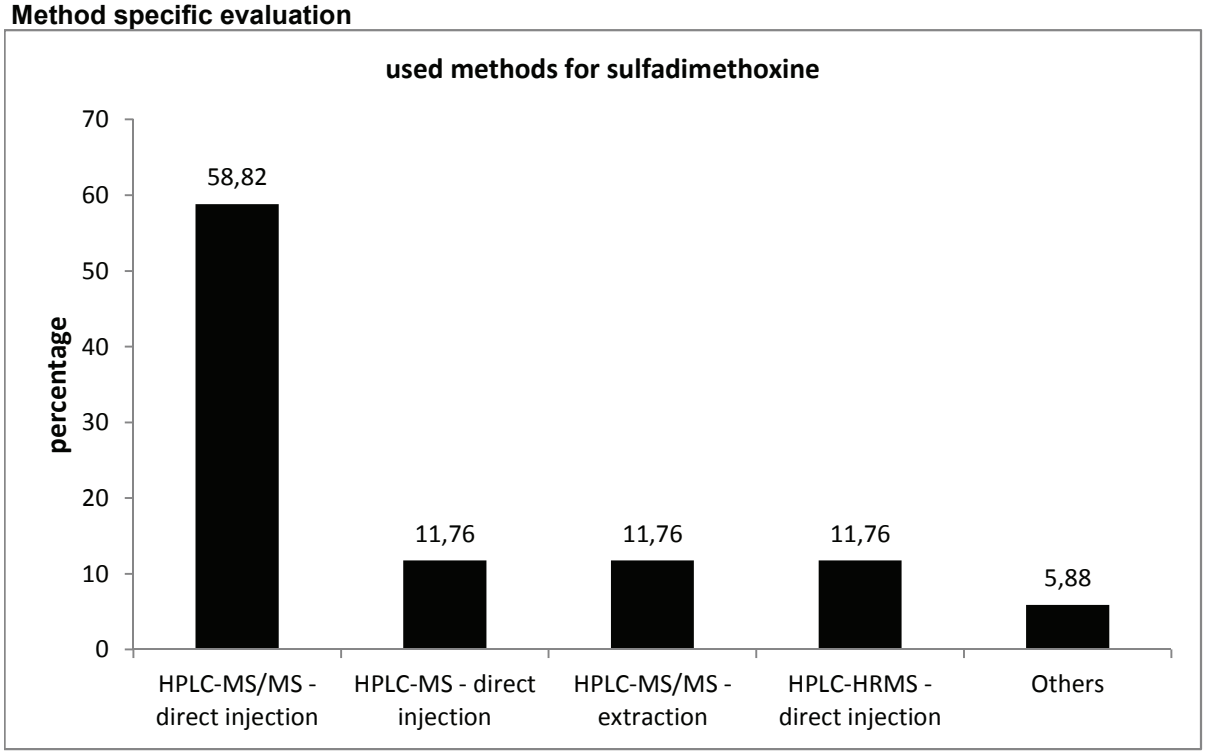
**Relative standard deviation and tolerance limits**

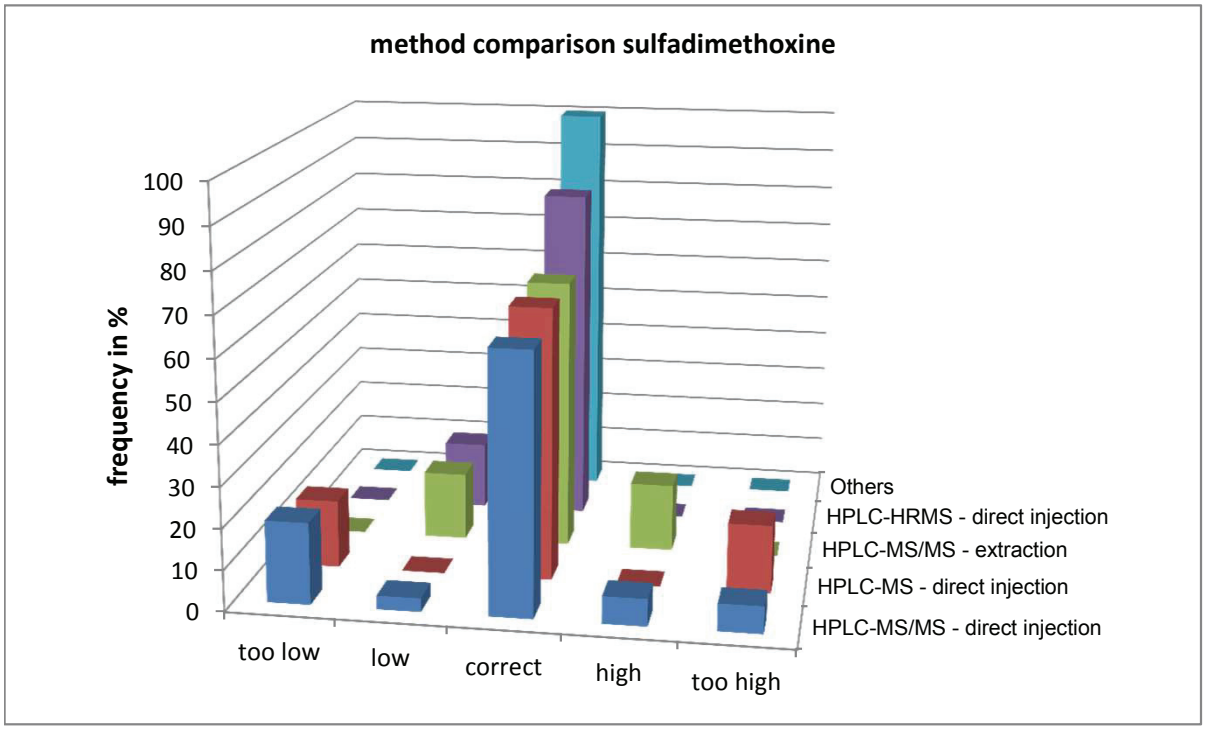



The relative standard deviations, calculated with the Q-method, did not reach the limits.



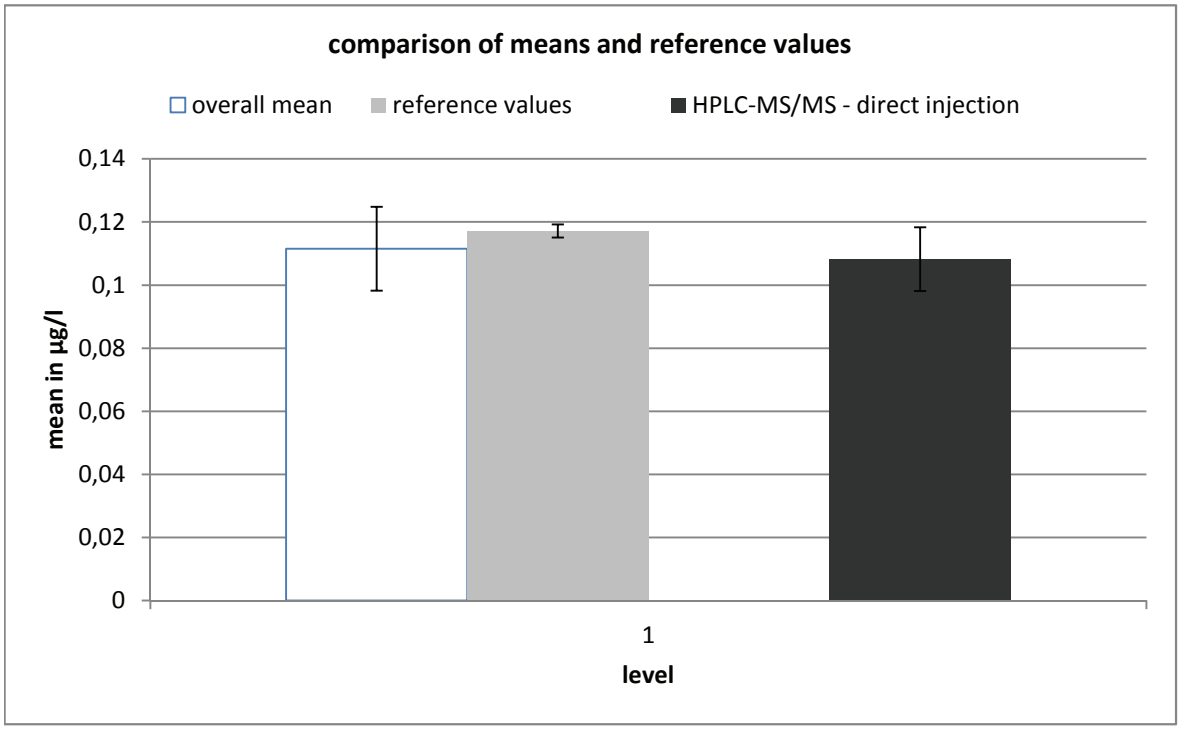
**Method specific evaluation**

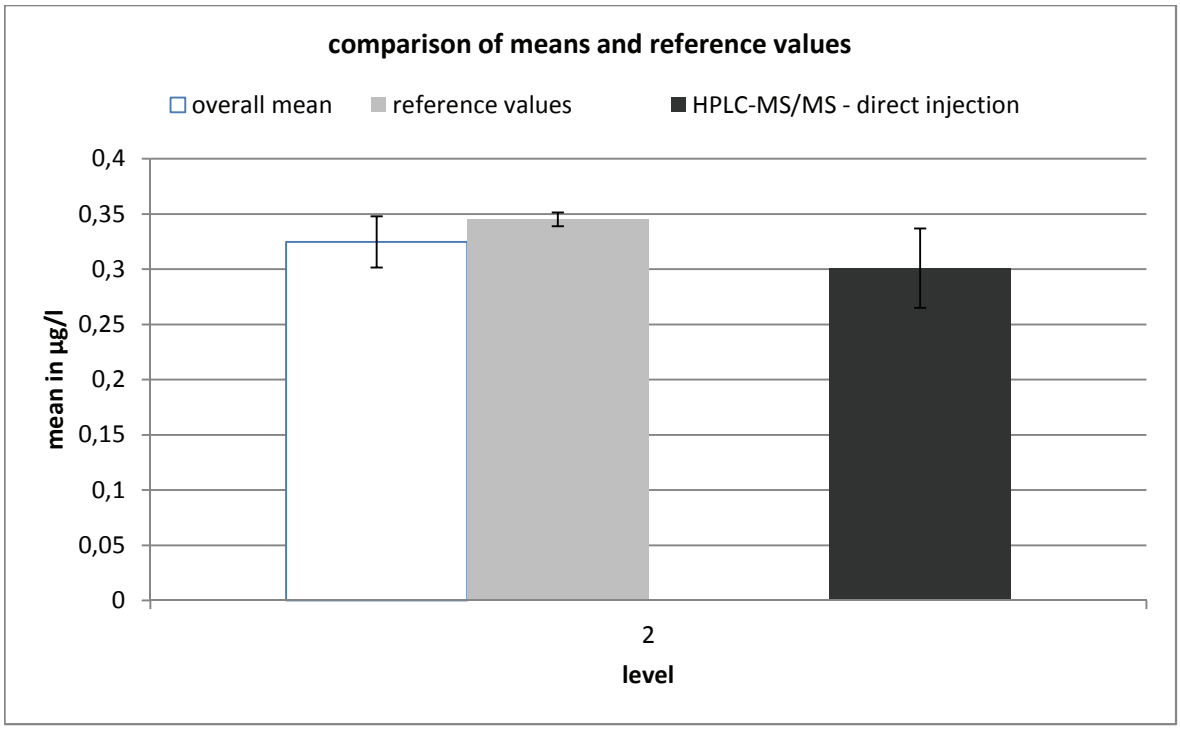


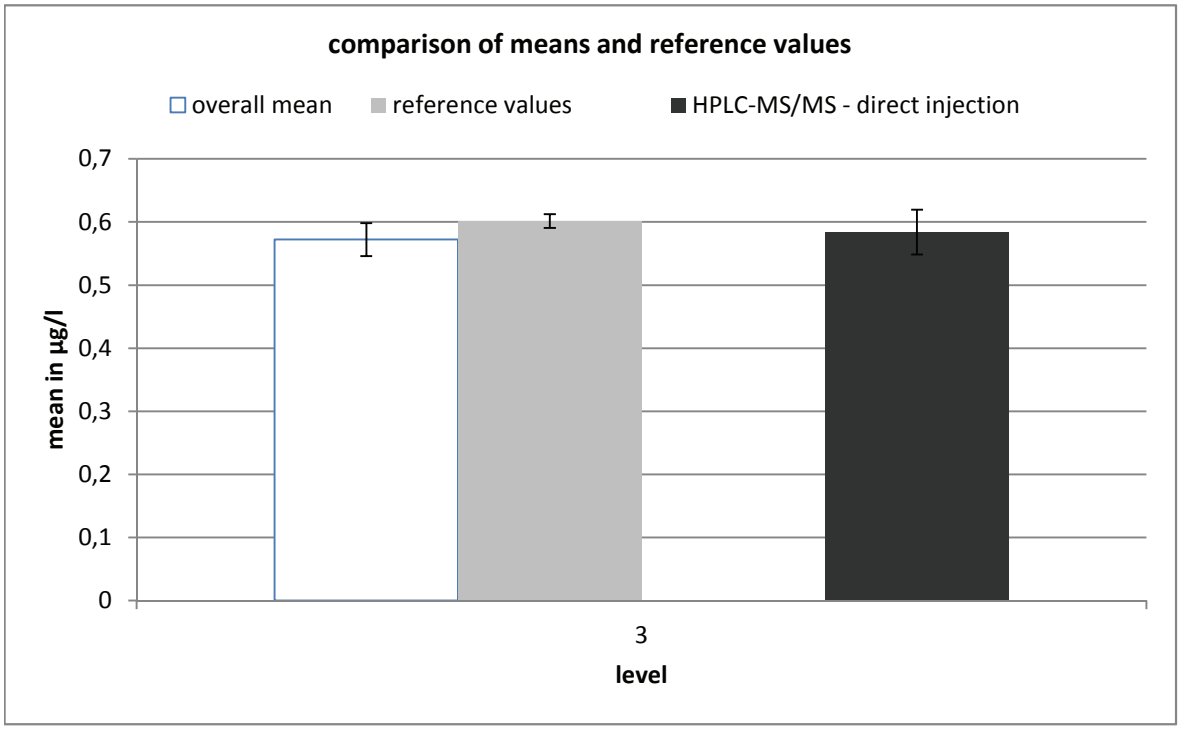



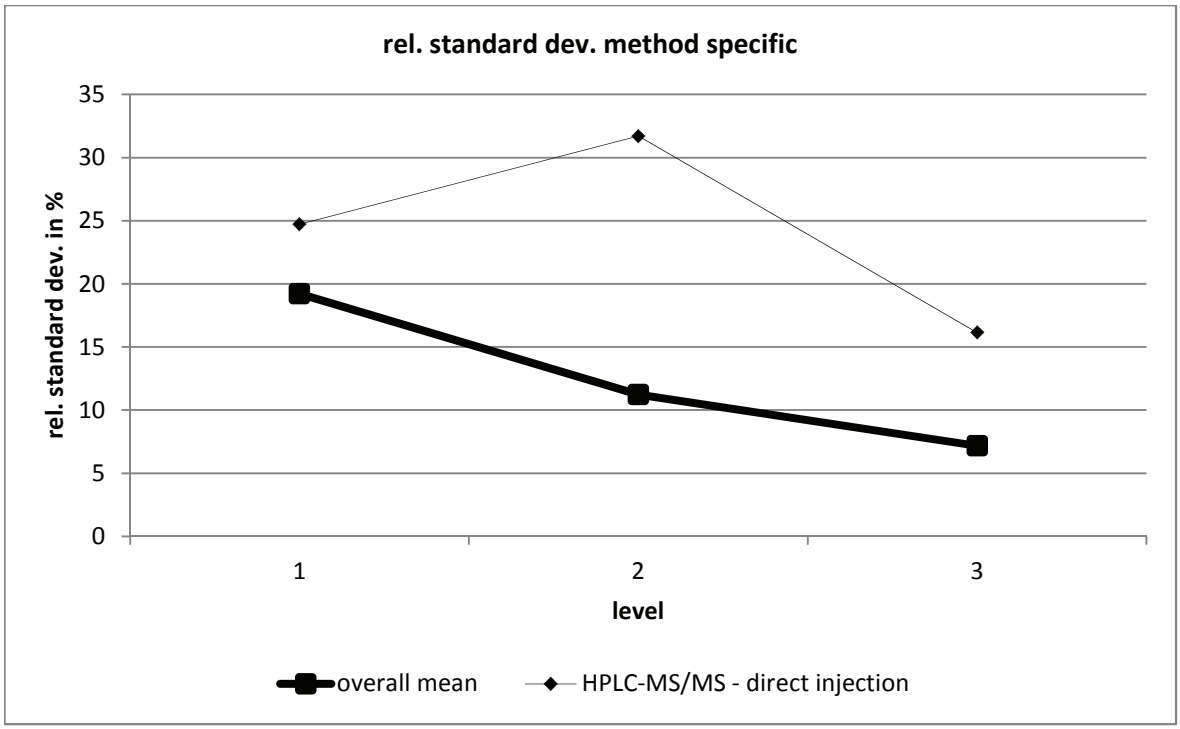
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1115 | 0,0133 | 11,9 | 0,1171 | 0,0021 | 1,8 |
| 2 | 0,3247 | 0,0233 | 7,2 | 0,3450 | 0,0062 | 1,8 |
| 3 | 0,5720 | 0,0260 | 4,6 | 0,6014 | 0,0109 | 1,8 |




comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level


comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

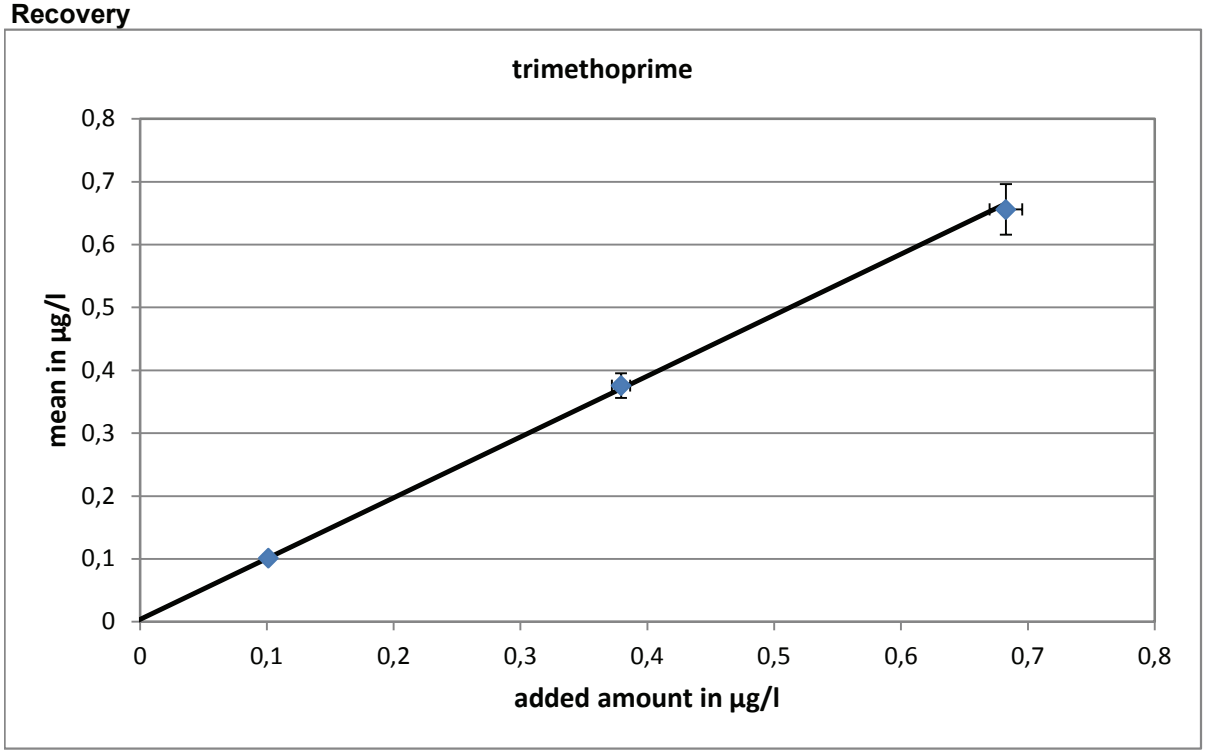



| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,108 | 0,01 | 9,315 | 0,027 | 24,72 | 11 | 0 | 2 | 18,18 |
| 2 | 0,301 | 0,036 | 11,95 | 0,095 | 31,7 | 11 | 1 | 1 | 18,18 |
| 3 | 0,584 | 0,036 | 6,088 | 0,094 | 16,15 | 11 | 1 | 0 | 9,091 |

# trimethoprime

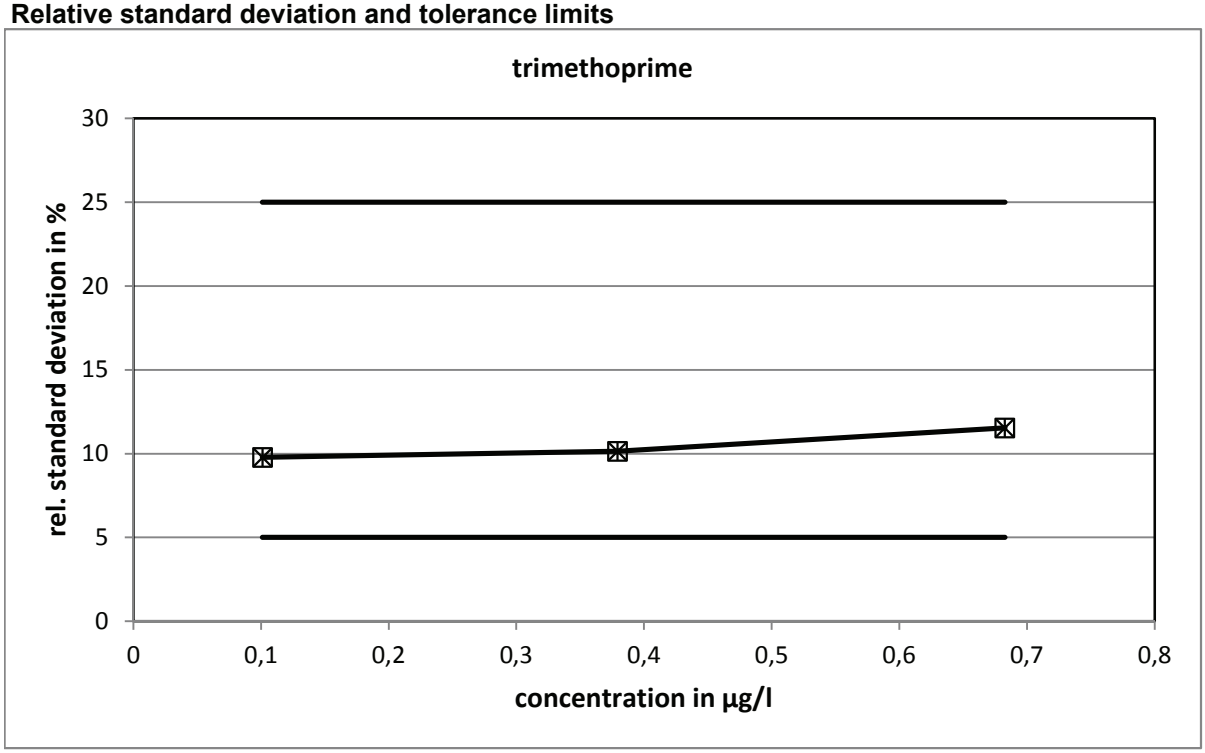
| level | assigned value [µg/l] | expanded uncertainty of the assigned value [%] | standard deviation, calculated using robust statistics [µg/l] | standard deviation for proficiency assessment [µg/l] | standard deviation for proficiency assessment [%] | upper tolerance limit [µg/l] | lower tolerance limit [µg/l] | upper tolerance limit [%] | lower tolerance limit [%] | number of results | out below | out above | out [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0,1011 | 1,81 | 0,0099 | 0,0099 | 9,78 | 0,1220 | 0,0822 | 20,61 | -18,70 | 24 | 0 | 2 | 8,3 |
| 2 | 0,3793 | 1,86 | 0,0385 | 0,0385 | 10,14 | 0,4605 | 0,3059 | 21,42 | -19,34 | 24 | 0 | 4 | 16,7 |
| 3 | 0,6827 | 1,87 | 0,0788 | 0,0788 | 11,54 | 0,8509 | 0,5335 | 24,64 | -21,86 | 24 | 2 | 2 | 16,7 |
| | | | | | | | | | sum | 72 | 2 | 8 | 13,9 |

**Recovery**

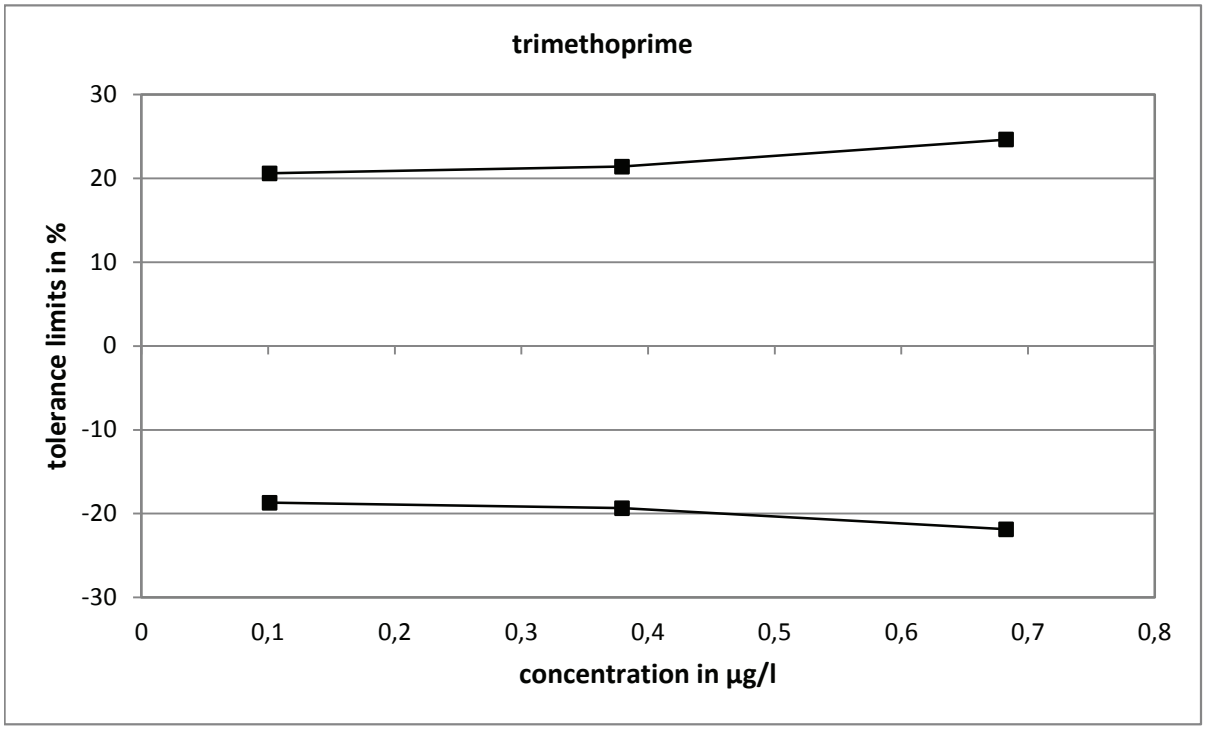



slope of the regression: 0,969
average recovery: 96,9%

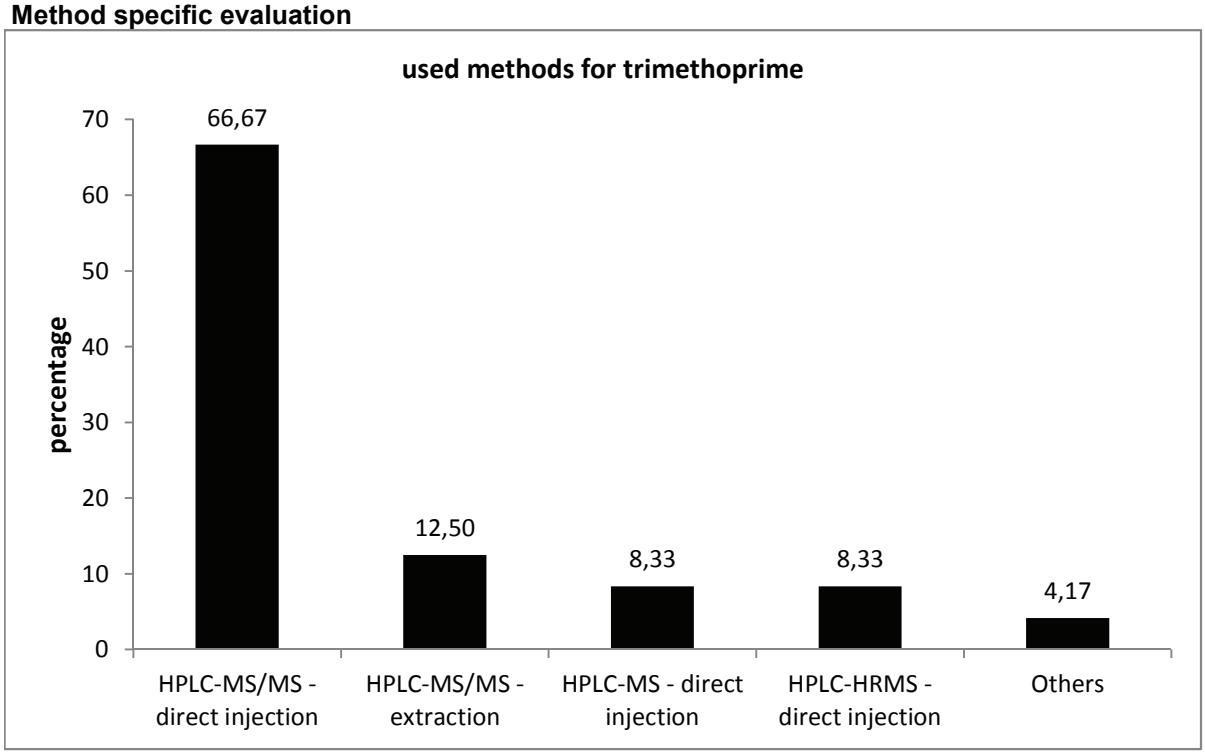
**Relative standard deviation and tolerance limits**

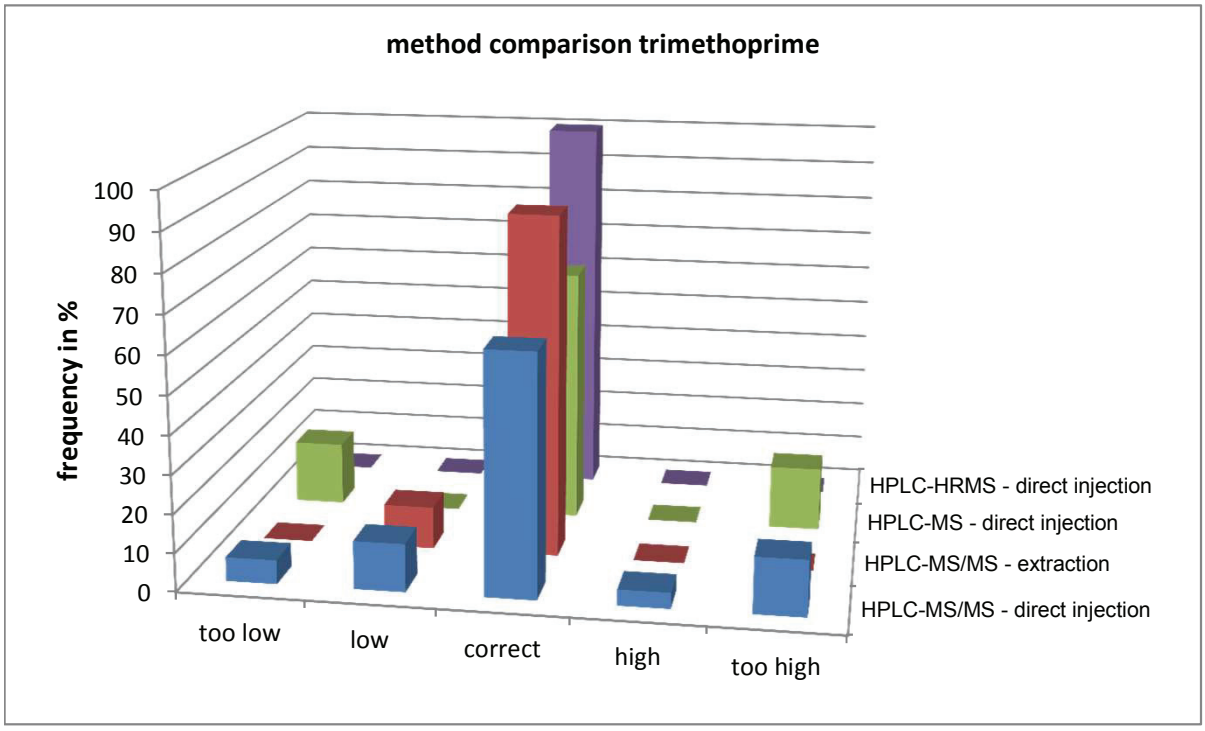



The relative standard deviations, calculated with the Q-method, did not reach the limits.



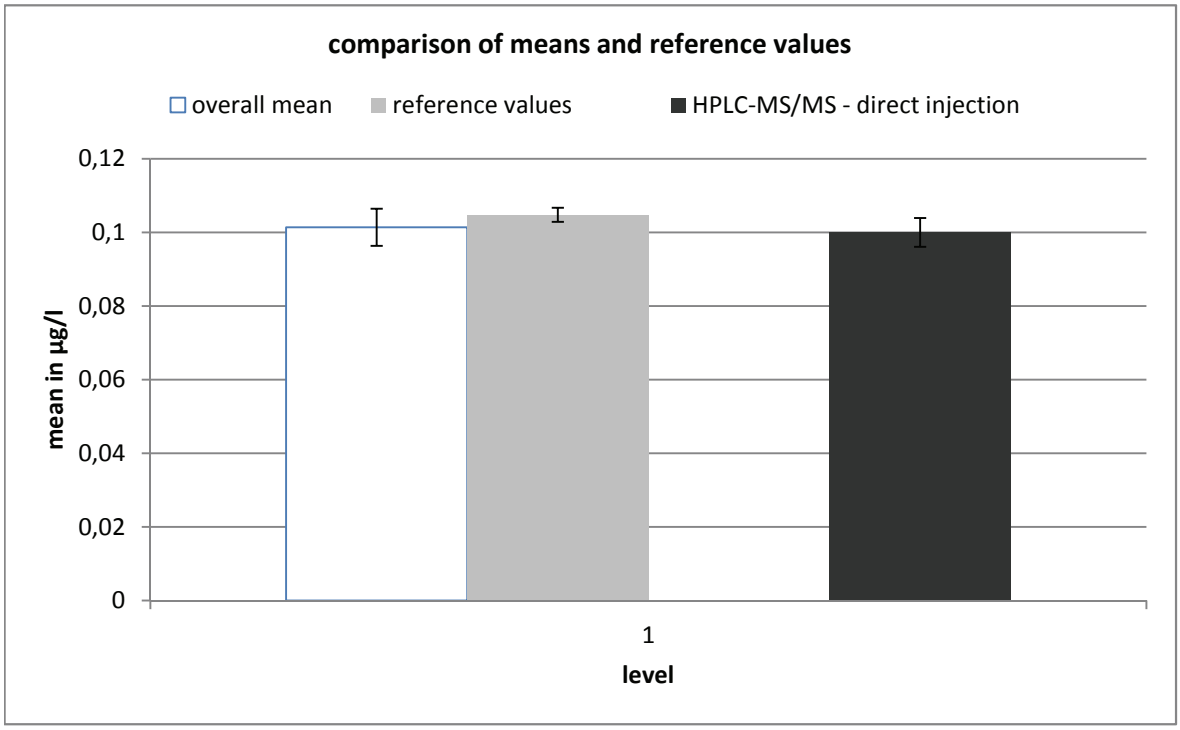
**Method specific evaluation**

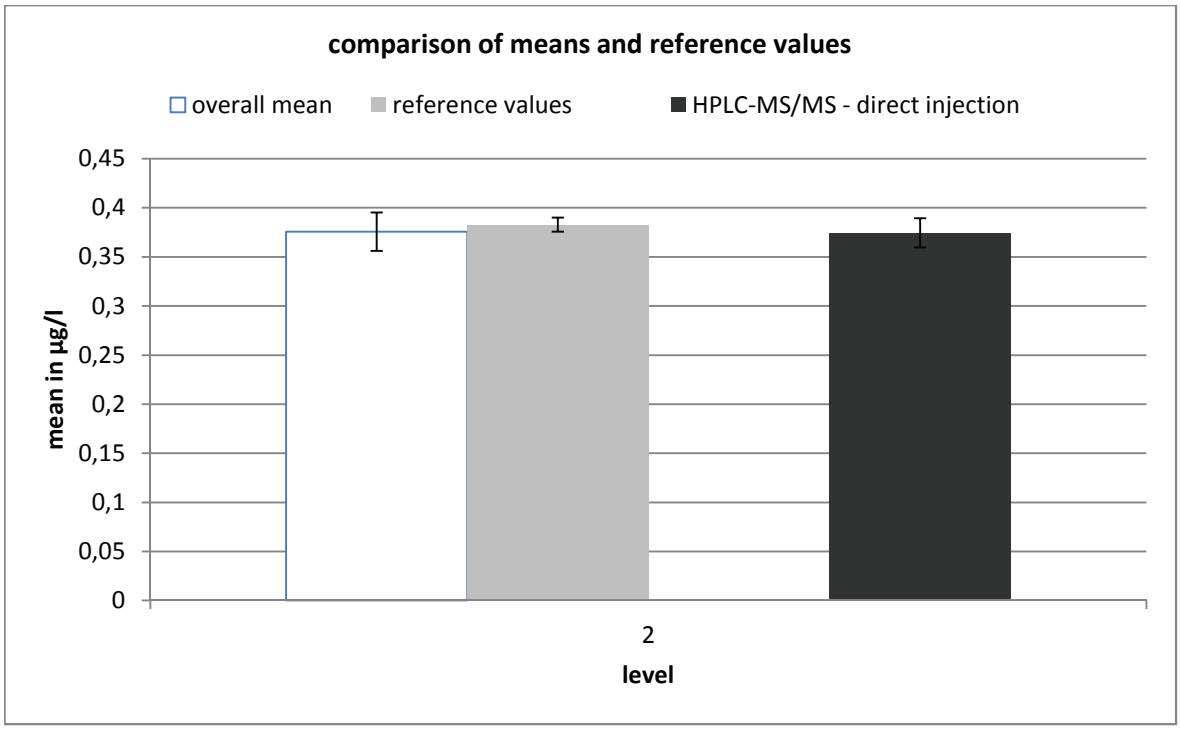


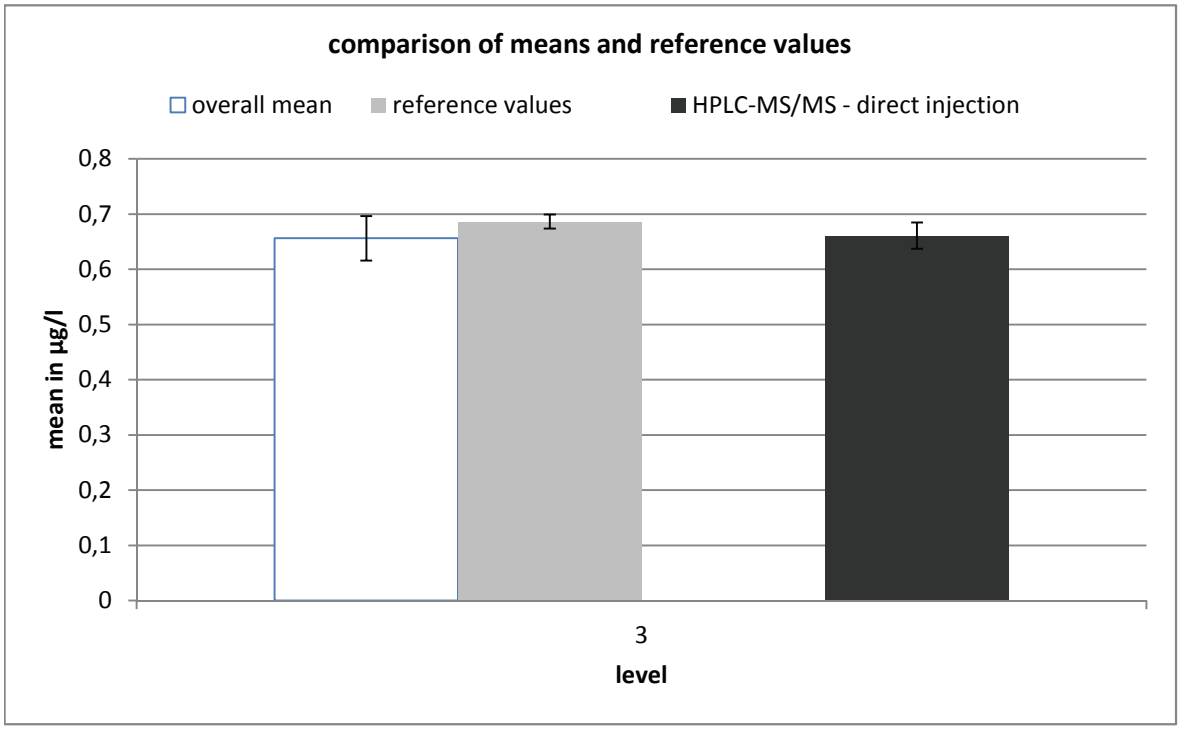



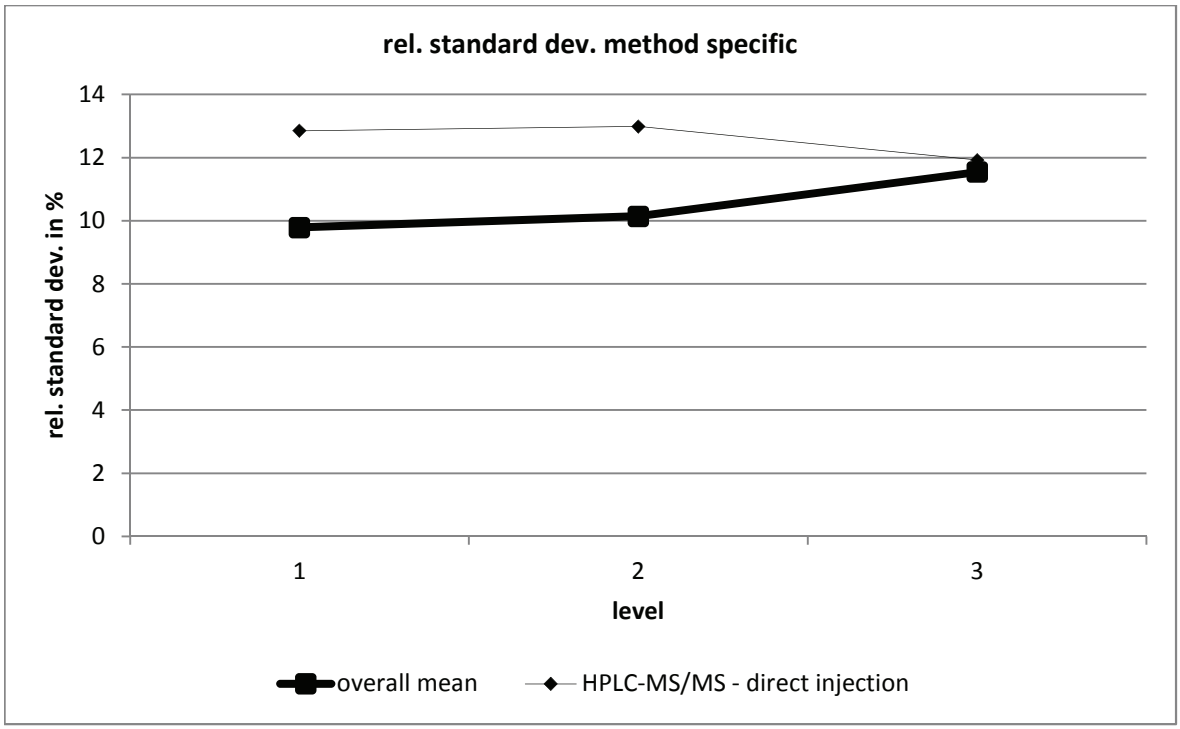
**Comparison of means and reference values**

| level | mean [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] | reference value [µg/l] | exp. uncertainty [µg/l] | exp. uncertainty [%] |
|---|---|---|---|---|---|---|
| 1 | 0,1014 | 0,0050 | 5,0 | 0,1048 | 0,0019 | 1,8 |
| 2 | 0,3757 | 0,0196 | 5,2 | 0,3829 | 0,0071 | 1,9 |
| 3 | 0,6561 | 0,0402 | 6,1 | 0,6863 | 0,0128 | 1,9 |

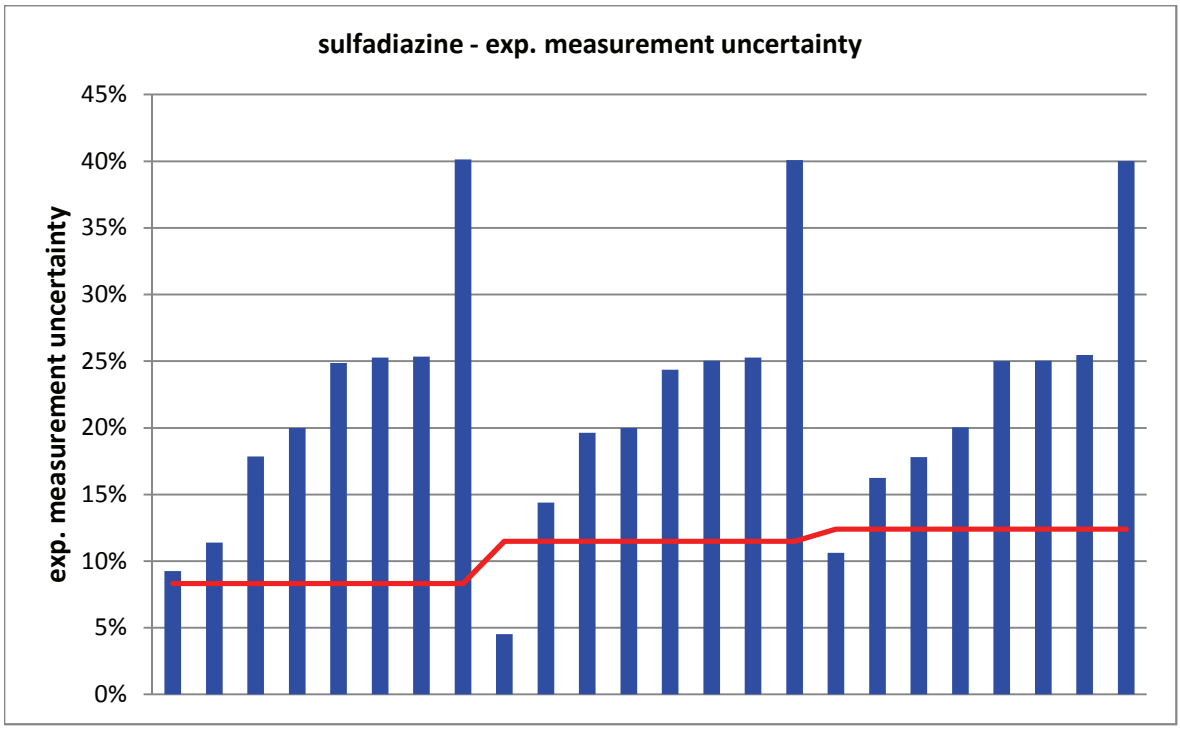


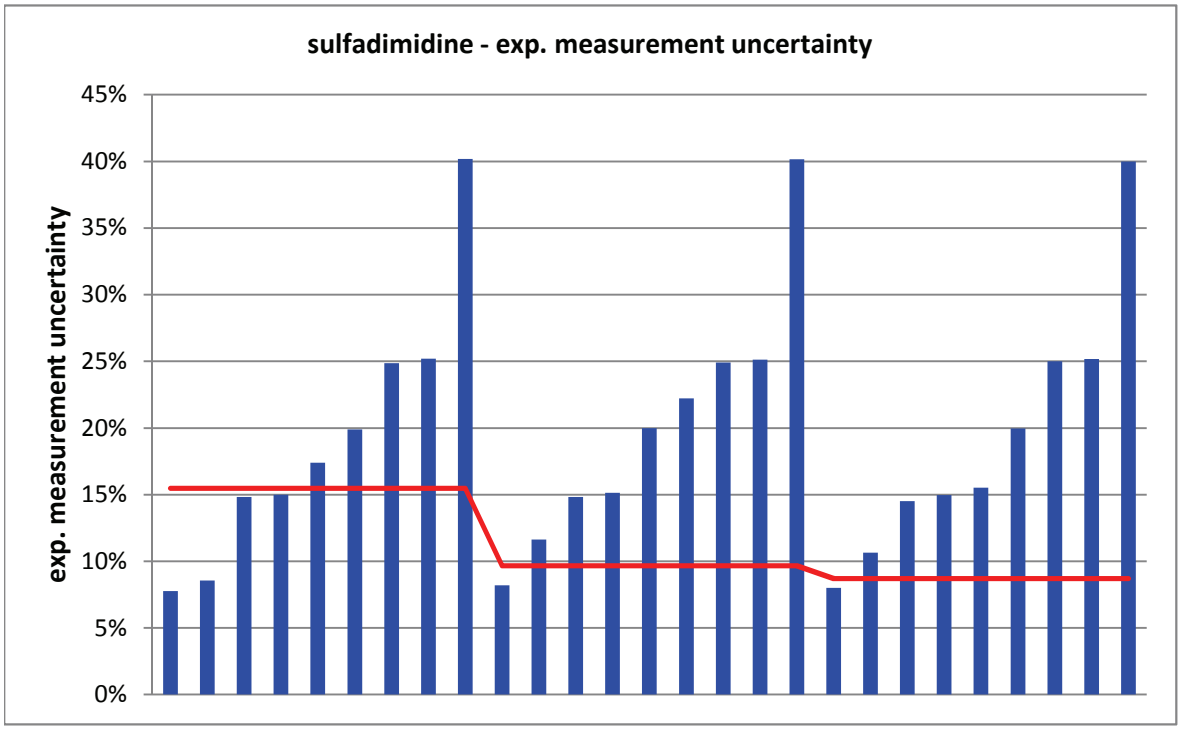

comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
mean in µg/l
2
level

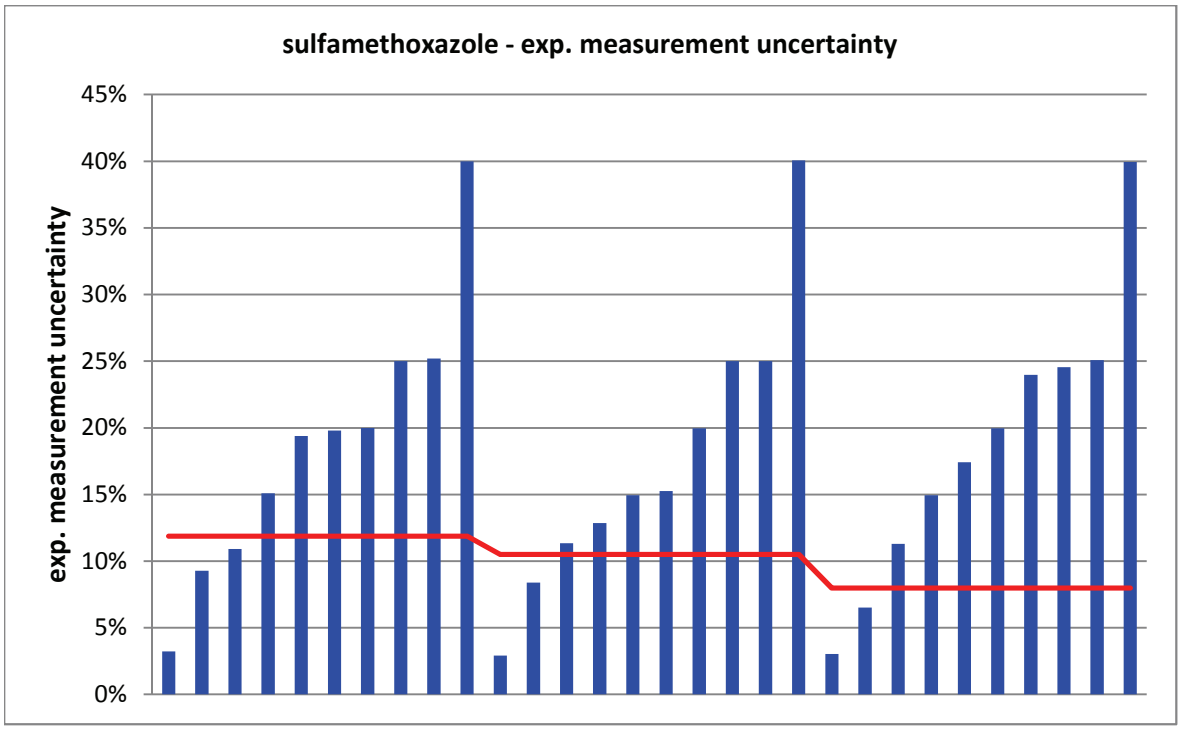

comparison of means and reference values
overall mean
reference values
HPLC-MS/MS - direct injection
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
mean in µg/l
3
level

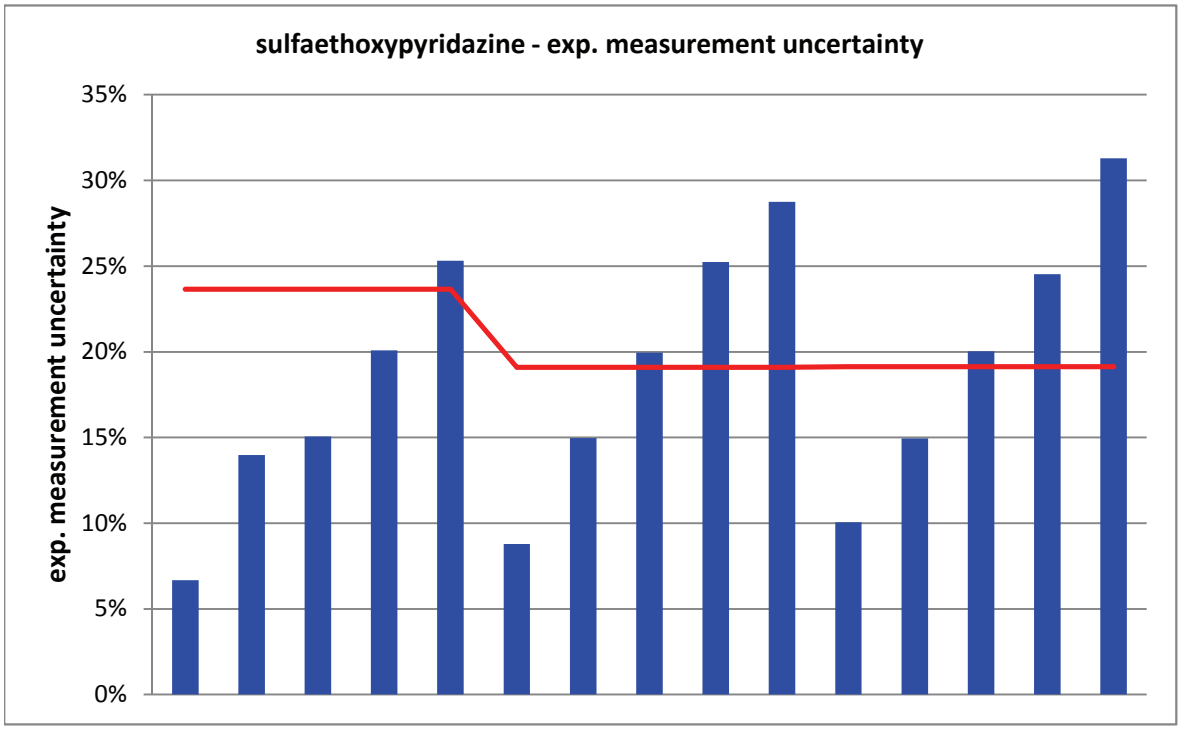


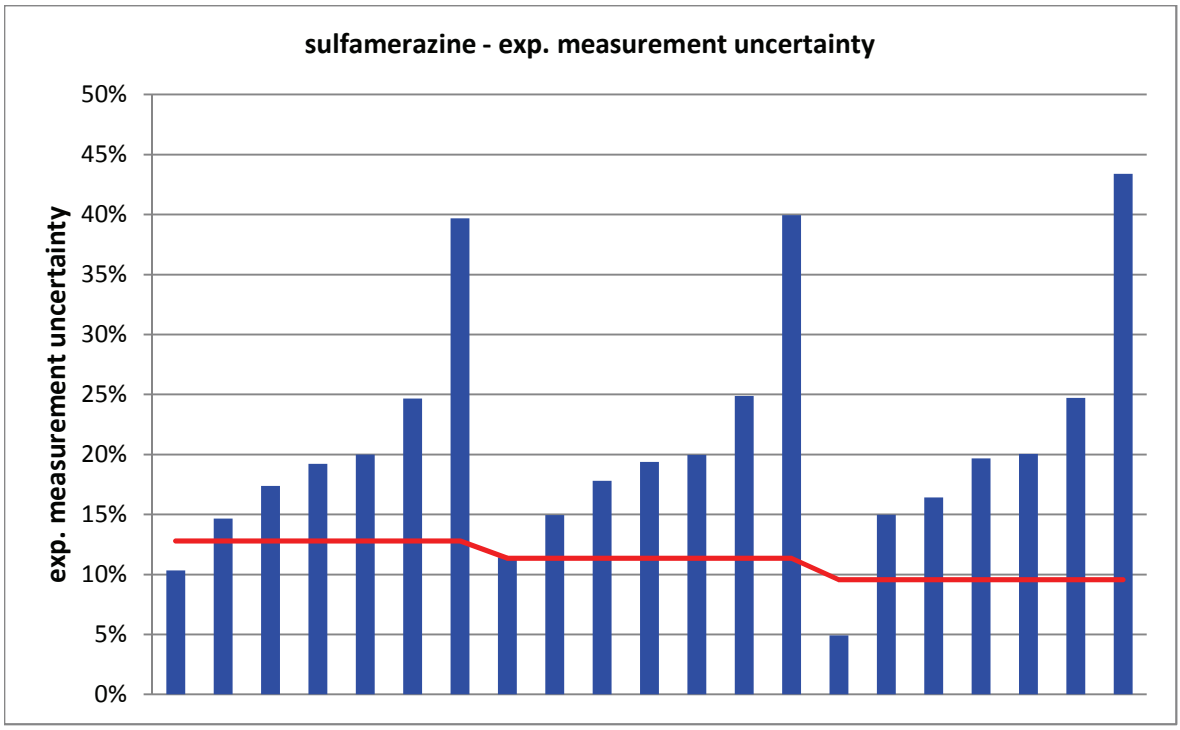

| HPLC-MS/MS - direct injection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| level | robust mean [µg/l] | exp. unc. of the mean [µg/l] | exp. unc. of the mean [%] | robust standard deviation [µg/l] | robust standard deviation [%] | number of results | out below | out above | out [%] |
| 1 | 0,1 | 0,004 | 3,897 | 0,013 | 12,85 | 17 | 0 | 3 | 17,65 |
| 2 | 0,375 | 0,015 | 3,937 | 0,049 | 12,99 | 17 | 0 | 3 | 17,65 |
| 3 | 0,661 | 0,024 | 3,614 | 0,079 | 11,92 | 17 | 1 | 2 | 17,65 |

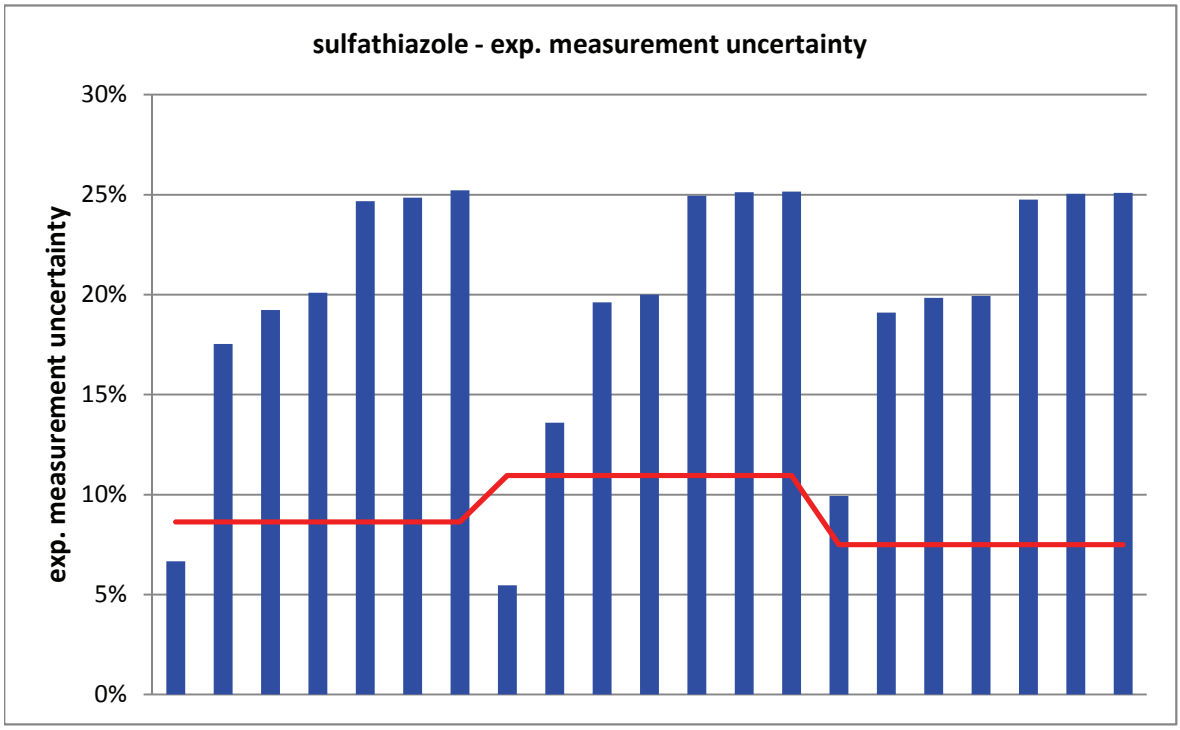

sulfadiazine - exp. measurement uncertainty
exp. measurement uncertainty
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%

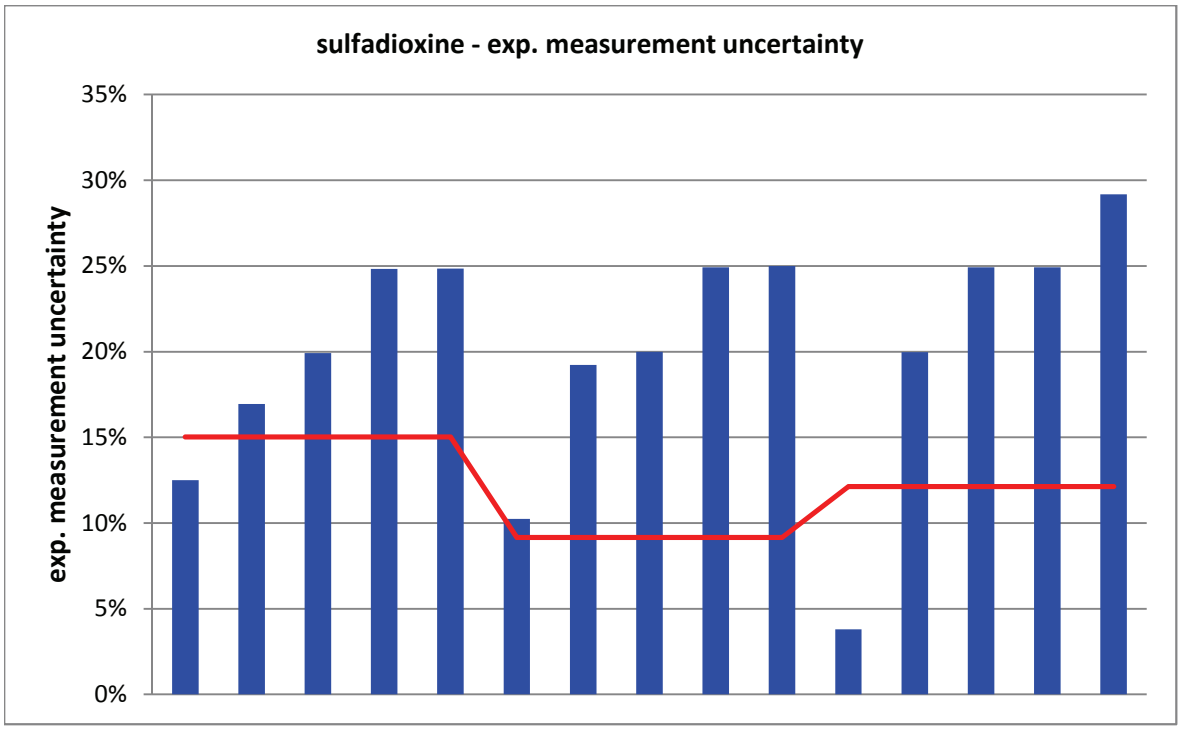

sulfadimidine - exp. measurement uncertainty
exp. measurement uncertainty
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%

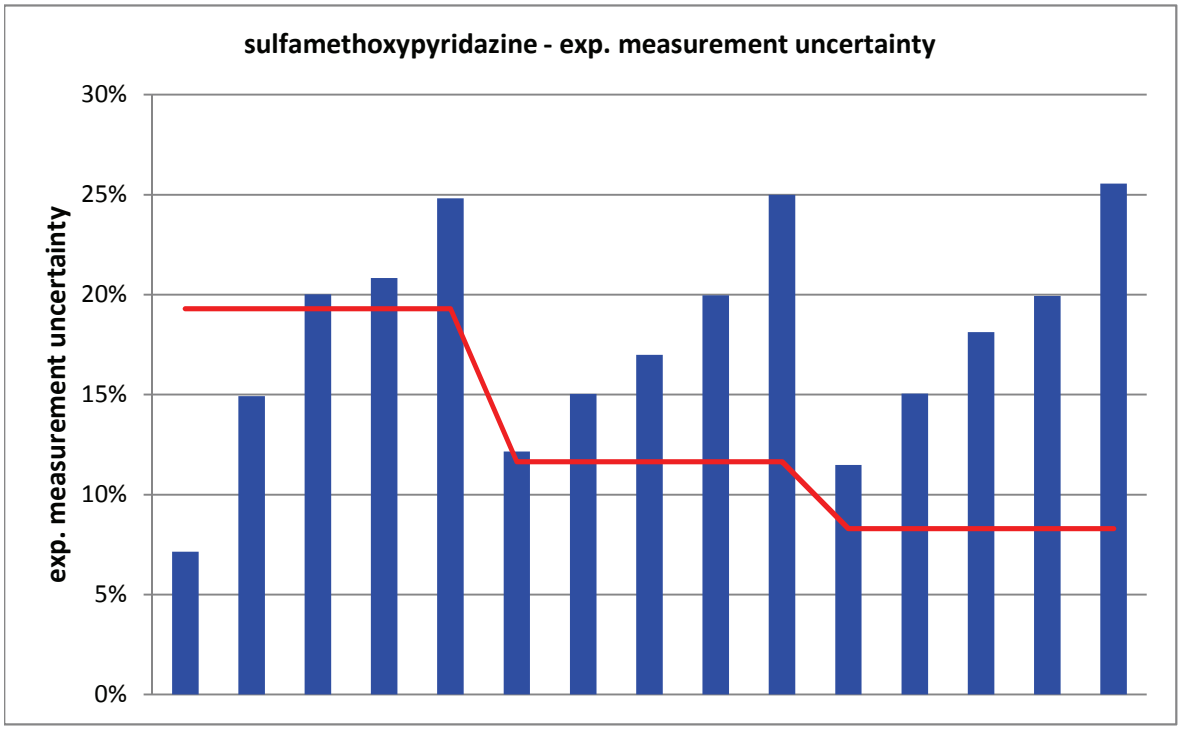

sulfamethoxazole - exp. measurement uncertainty
exp. measurement uncertainty
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%

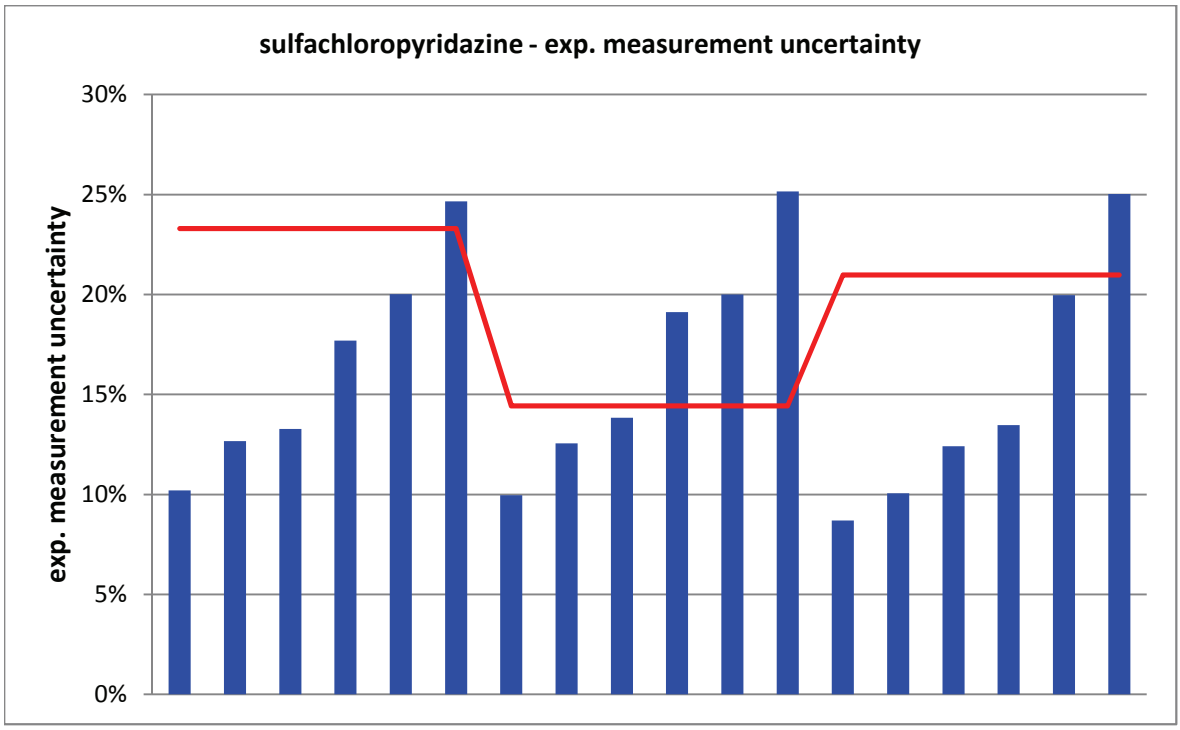

sulfaethoxypyridazine - exp. measurement uncertainty
exp. measurement uncertainty
35%
30%
25%
20%
15%
10%
5%
0%

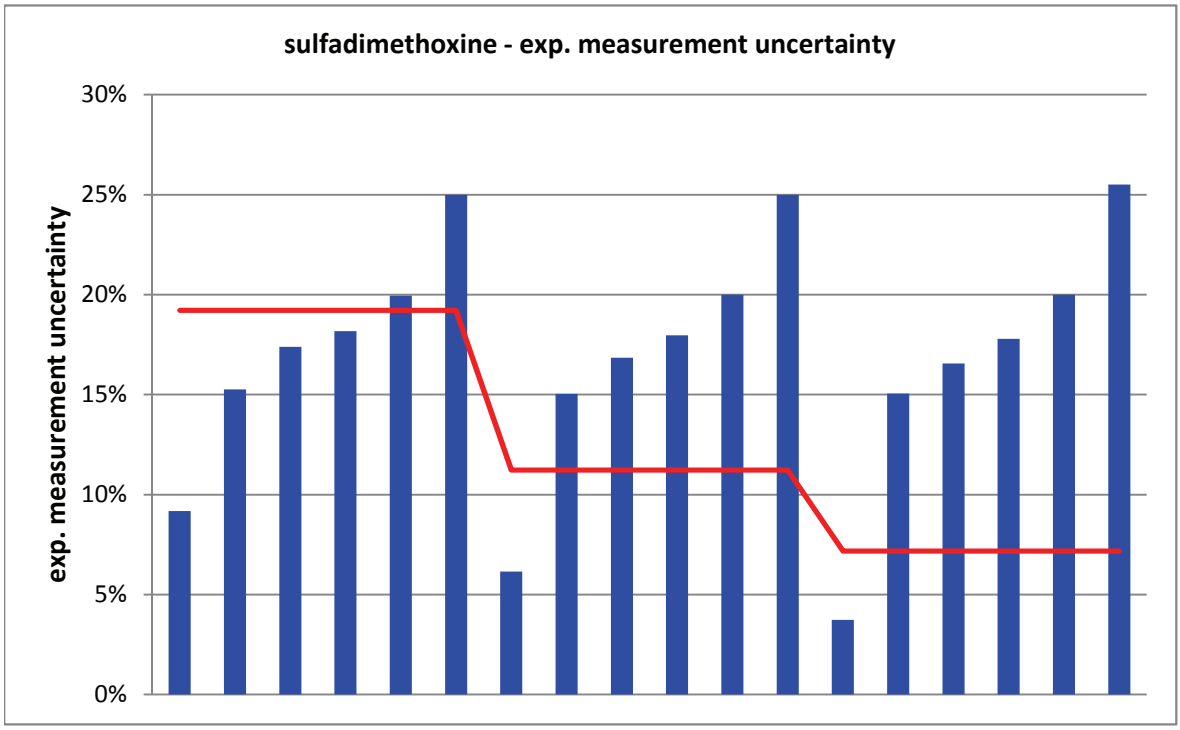

sulfamerazine - exp. measurement uncertainty
exp. measurement uncertainty
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%

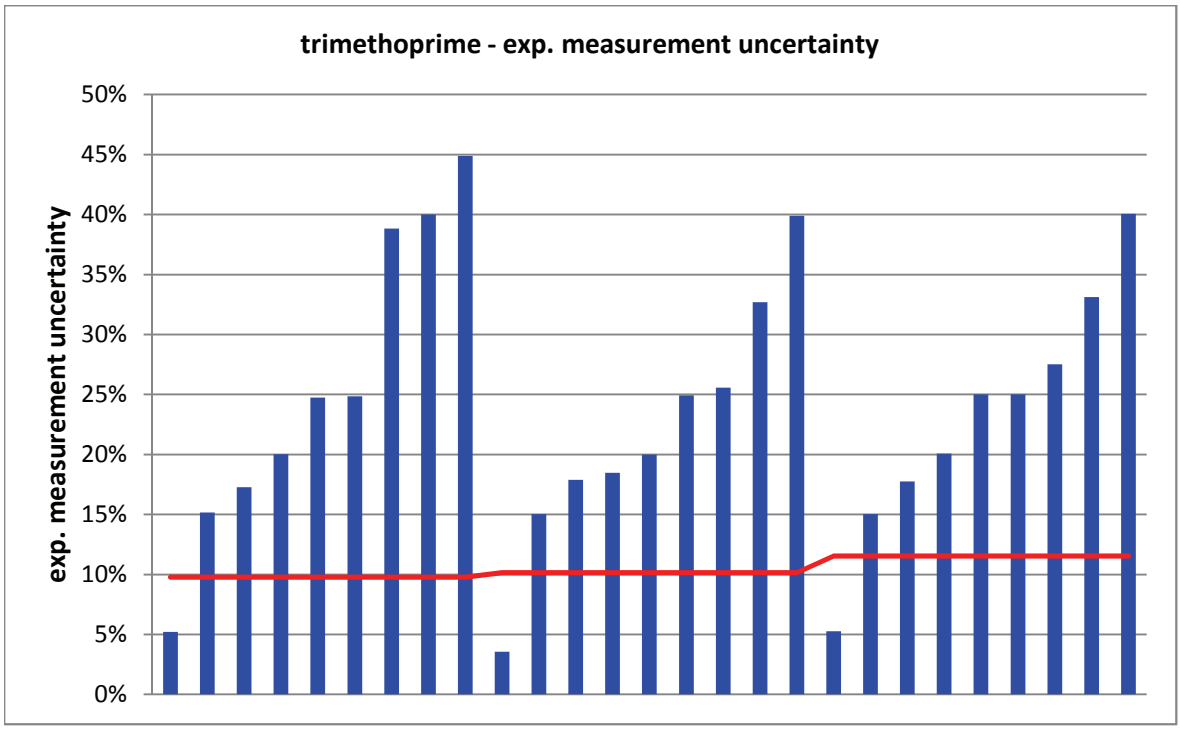

sulfathiazole - exp. measurement uncertainty
exp. measurement uncertainty
30%
25%
20%
15%
10%
5%
0%


sulfadioxine - exp. measurement uncertainty
exp. measurement uncertainty
35%
30%
25%
20%
15%
10%
5%
0%


sulfamethoxypyridazine - exp. measurement uncertainty
exp. measurement uncertainty
30%
25%
20%
15%
10%
5%
0%


sulfachloropyridazine - exp. measurement uncertainty
exp. measurement uncertainty
30%
25%
20%
15%
10%
5%
0%

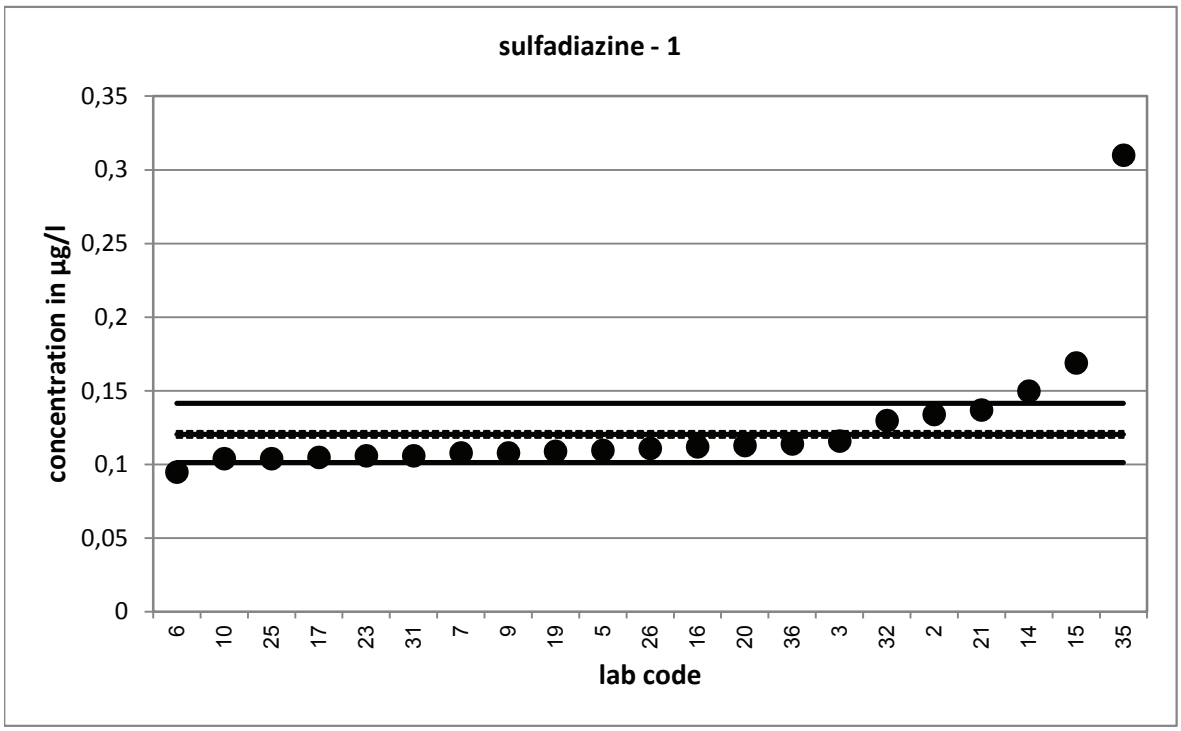

sulfadimethoxine - exp. measurement uncertainty
exp. measurement uncertainty
30%
25%
20%
15%
10%
5%
0%

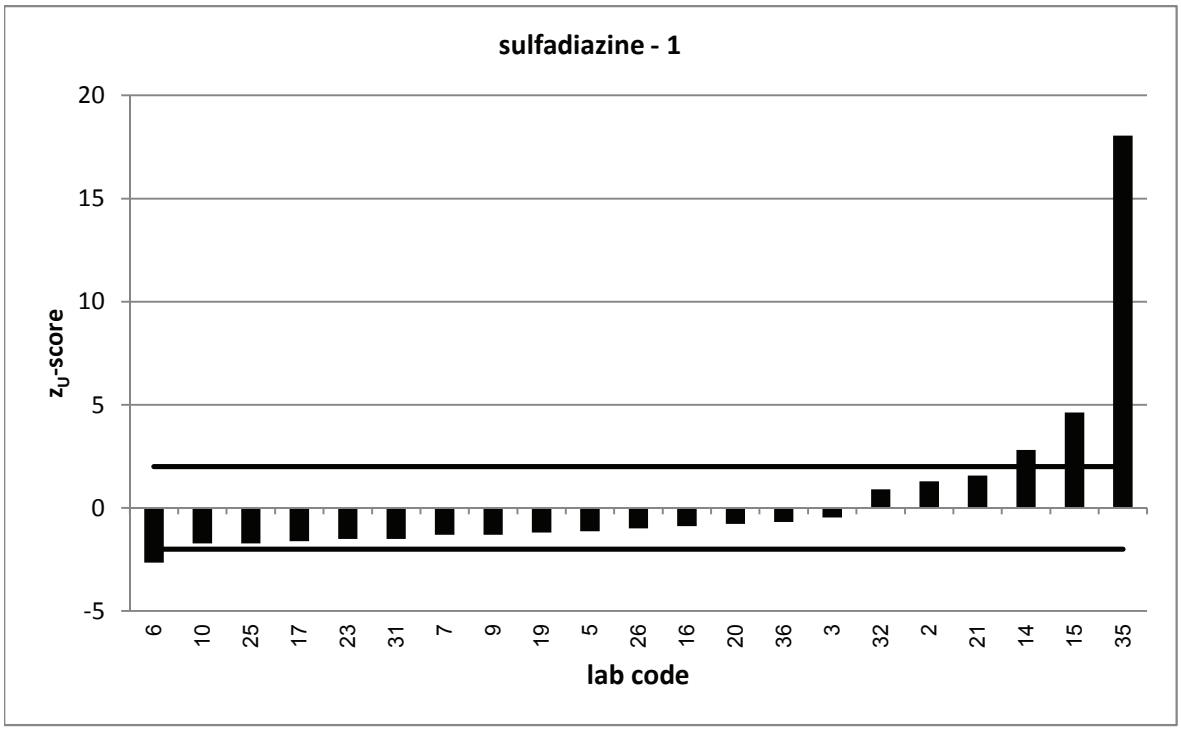

trimethoprime - exp. measurement uncertainty
exp. measurement uncertainty
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%

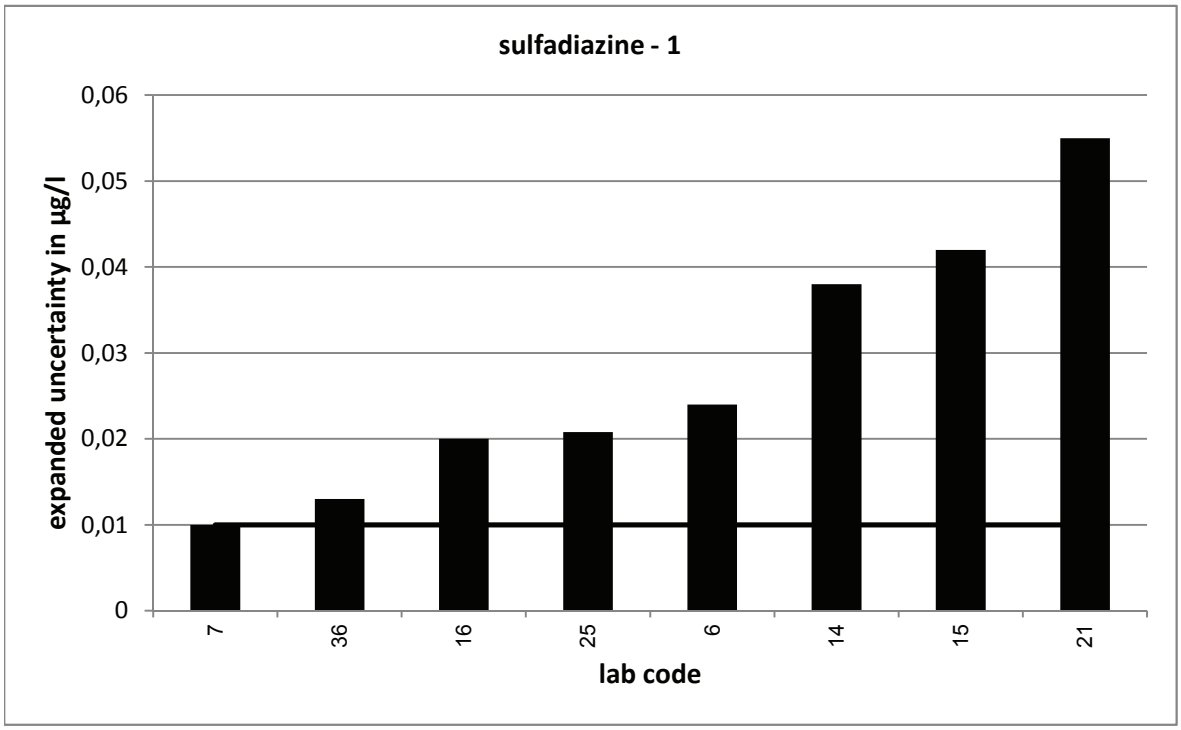
| PT 5/16 - TW S2 | | sulfadiazine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1205 | ± 0,0022 | | |
| upper tolerance limit [µg/l] | | 0,1415 | | | |
| lower tolerance limit [µg/l] | | 0,1013 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,134 | | | 1,3 | s |
| 3 | 0,116 | | | -0,5 | s |
| 5 | 0,1096 | | | -1,1 | s |
| 6 | 0,095 | 0,024 | -2,1 | -2,7 | q |
| 7 | 0,108 | 0,01 | -2,4 | -1,3 | s |
| 9 | 0,108 | | | -1,3 | s |
| 10 | 0,104 | | | -1,7 | s |
| 14 | 0,15 | 0,038 | 1,6 | 2,8 | q |
| 15 | 0,169 | 0,042 | 2,3 | 4,6 | u |
| 16 | 0,112 | 0,02 | -0,8 | -0,9 | s |
| 17 | 0,105 | | | -1,6 | s |
| 19 | 0,109 | | | -1,2 | s |
| 20 | 0,113 | | | -0,8 | s |
| 21 | 0,137 | 0,055 | 0,6 | 1,6 | s |
| 23 | 0,106 | | | -1,5 | s |
| 25 | 0,104 | 0,021 | -1,6 | -1,7 | s |
| 26 | 0,111 | | | -1,0 | s |
| 31 | 0,106 | | | -1,5 | s |
| 32 | 0,13 | | | 0,9 | s |
| 35 | 0,31 | | | 18,1 | u |
| 36 | 0,114 | 0,013 | -1,0 | -0,7 | s |

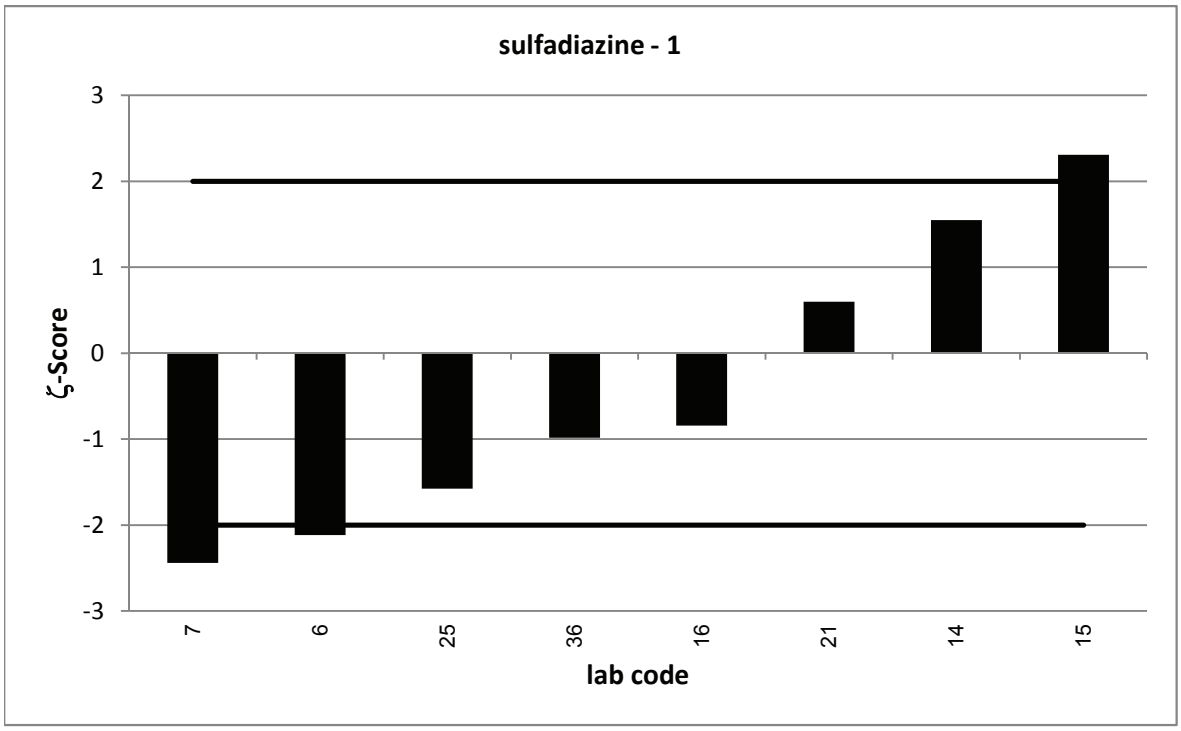
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadiazine - 1
concentration in µg/l
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
6 10 25 17 23 31 7 9 19 5 26 16 20 36 3 32 2 21 14 15 35
lab code

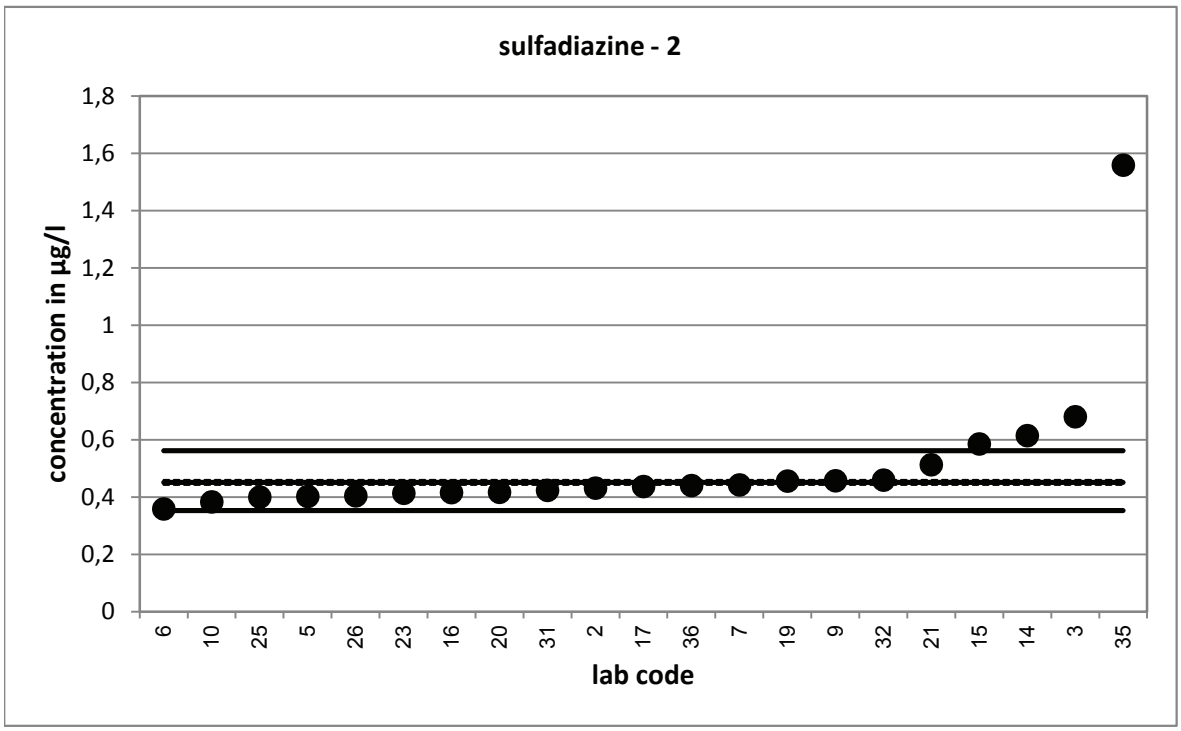

sulfadiazine - 1
$z_U$-score
20
15
10
5
0
-5
6 10 25 17 23 31 7 9 19 5 26 16 20 36 3 32 2 21 14 15 35
lab code

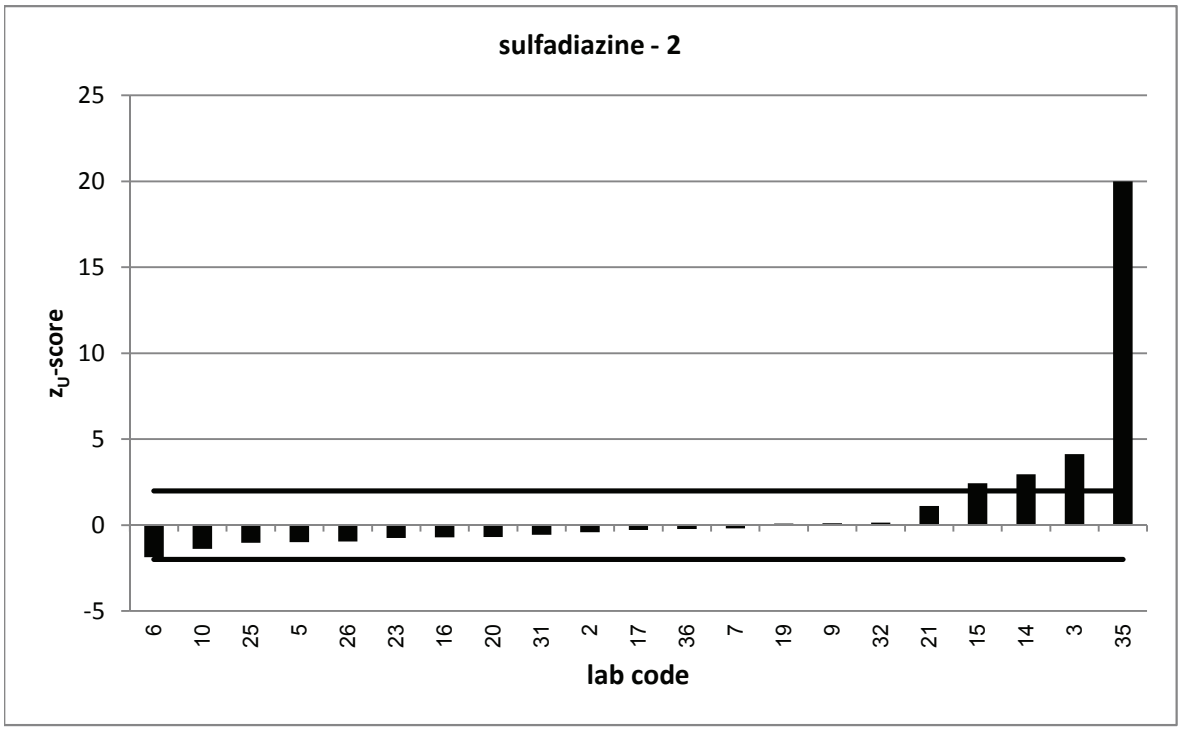

sulfadiazine - 1
expanded uncertainty in µg/l
0,06
0,05
0,04
0,03
0,02
0,01
0
7
36
16
25
6
14
15
21
lab code

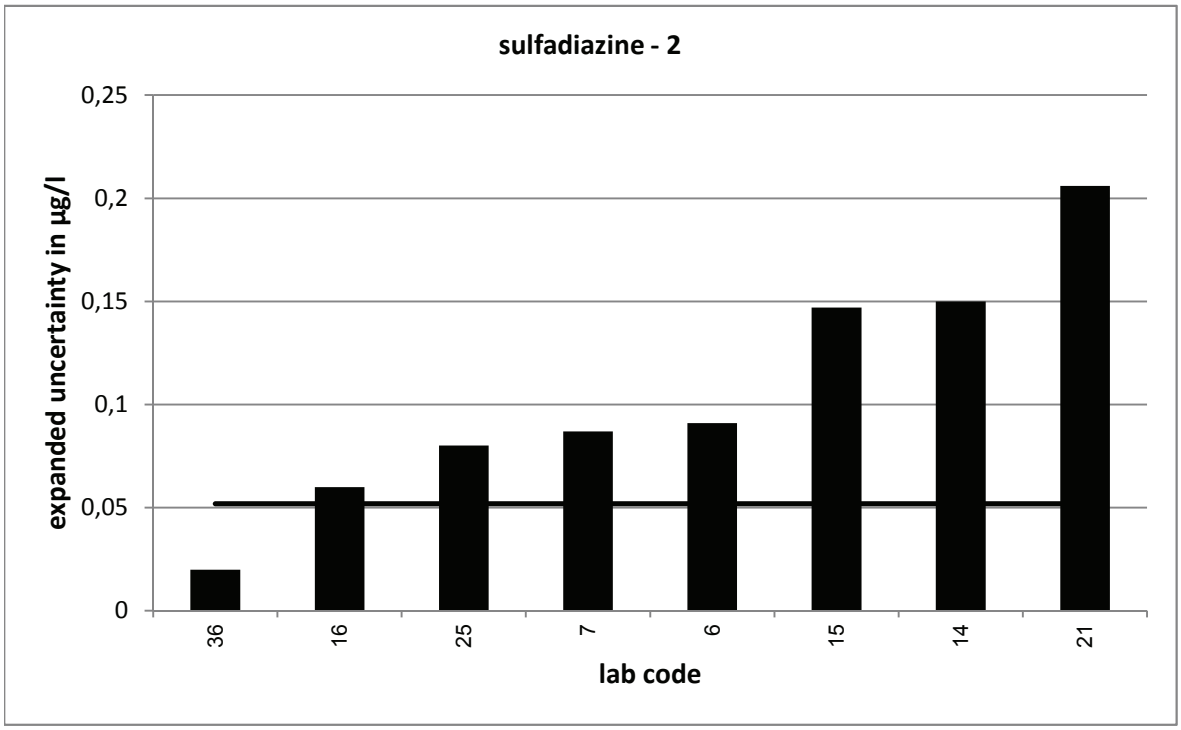

sulfadiazine - 1
ζ-Score
3
2
1
0
-1
-2
-3
7
6
25
36
16
21
14
15
lab code

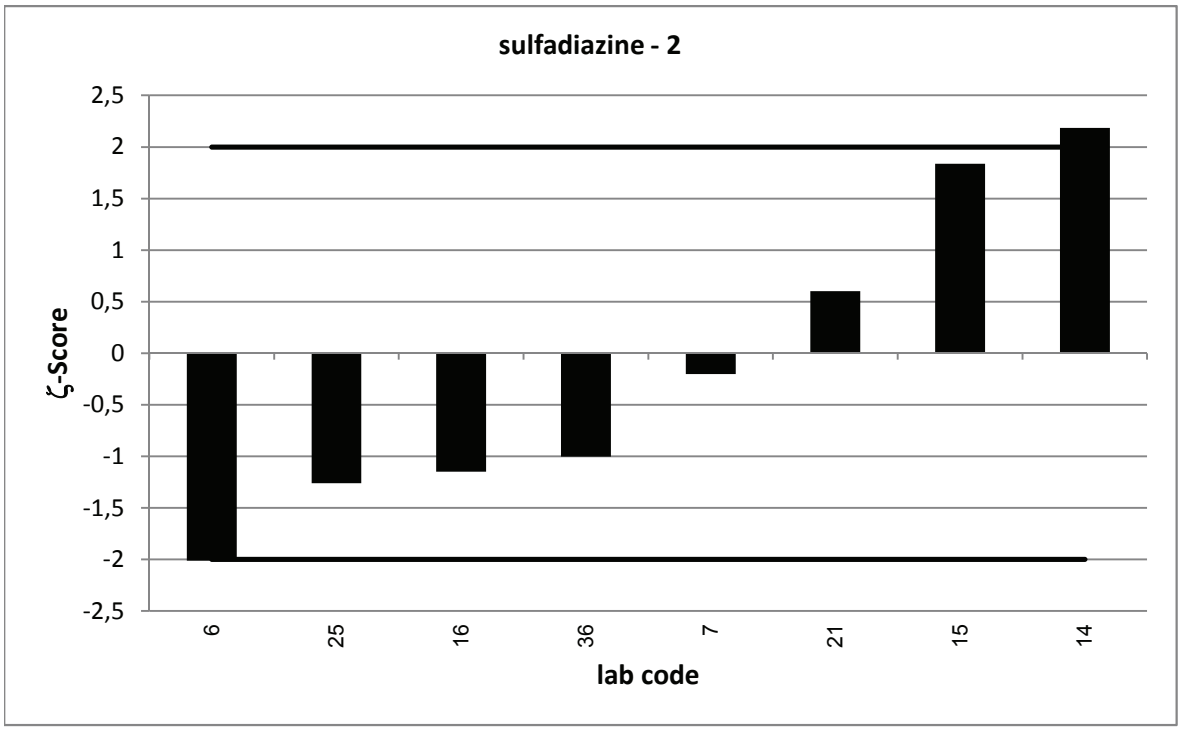
| PT 5/16 - TW S2 | | sulfadiazine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,4518 | ± 0,0082 | | |
| upper tolerance limit [µg/l] | | 0,5626 | | | |
| lower tolerance limit [µg/l] | | 0,3534 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,432 | | | -0,4 | s |
| 3 | 0,681 | | | 4,1 | u |
| 5 | 0,4032 | | | -1,0 | s |
| 6 | 0,36 | 0,091 | -2,0 | -1,9 | s |
| 7 | 0,443 | 0,087 | -0,2 | -0,2 | s |
| 9 | 0,458 | | | 0,1 | s |
| 10 | 0,384 | | | -1,4 | s |
| 14 | 0,616 | 0,15 | 2,2 | 3,0 | u |
| 15 | 0,587 | 0,147 | 1,8 | 2,4 | q |
| 16 | 0,417 | 0,06 | -1,1 | -0,7 | s |
| 17 | 0,438 | | | -0,3 | s |
| 19 | 0,457 | | | 0,1 | s |
| 20 | 0,418 | | | -0,7 | s |
| 21 | 0,514 | 0,206 | 0,6 | 1,1 | s |
| 23 | 0,415 | | | -0,7 | s |
| 25 | 0,401 | 0,08 | -1,3 | -1,0 | s |
| 26 | 0,405 | | | -1,0 | s |
| 31 | 0,424 | | | -0,6 | s |
| 32 | 0,46 | | | 0,1 | s |
| 35 | 1,56 | | | 20,0 | u |
| 36 | 0,441 | 0,02 | -1,0 | -0,2 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfadiazine - 2
concentration in µg/l
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
6 10 25 5 26 23 16 20 31 2 17 36 7 19 9 32 21 15 14 3 35
lab code

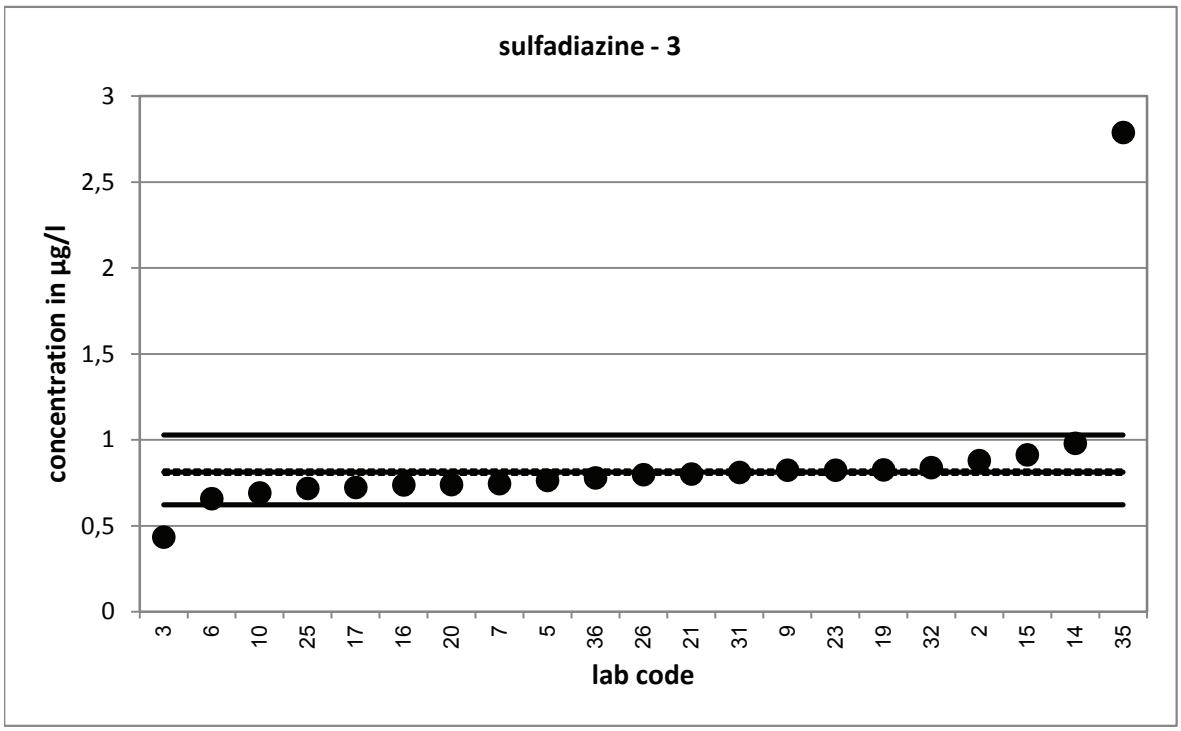

sulfadiazine - 2
$z_U$-score
25
20
15
10
5
0
-5
6 10 25 5 26 23 16 20 31 2 17 36 7 19 9 32 21 15 14 3 35
lab code

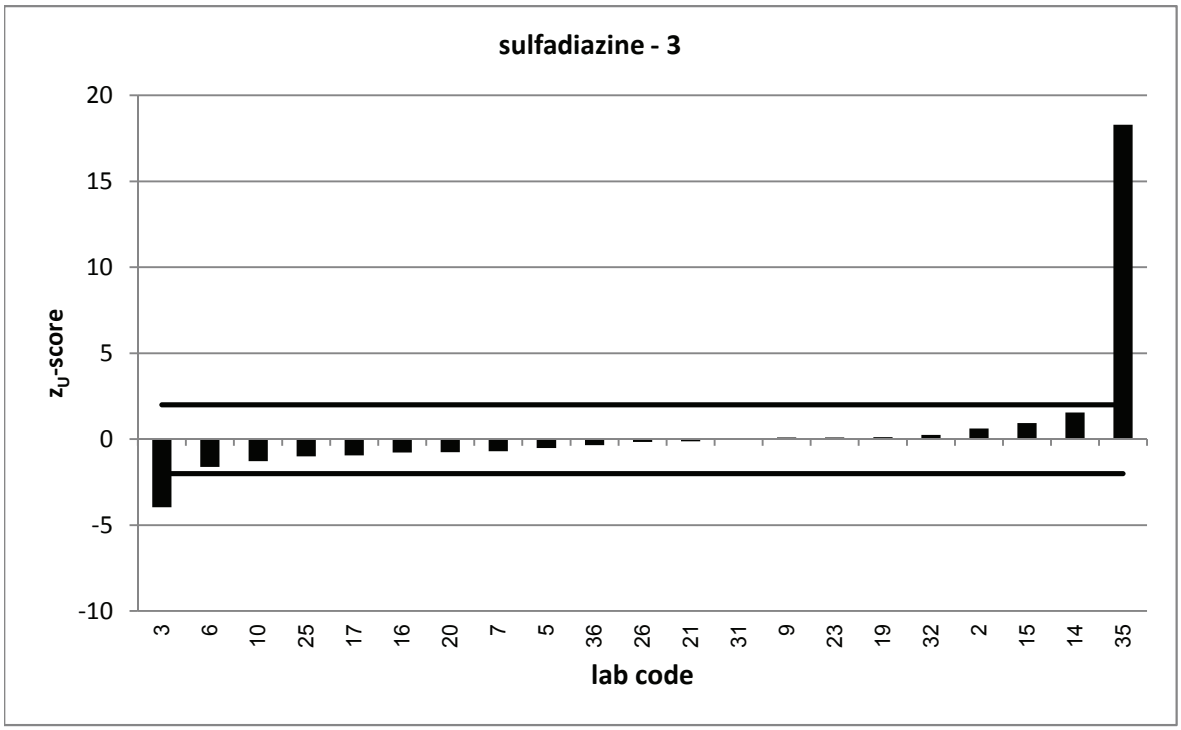

sulfadiazine - 2
expanded uncertainty in µg/l
0,25
0,2
0,15
0,1
0,05
0
36
16
25
7
6
15
14
21
lab code

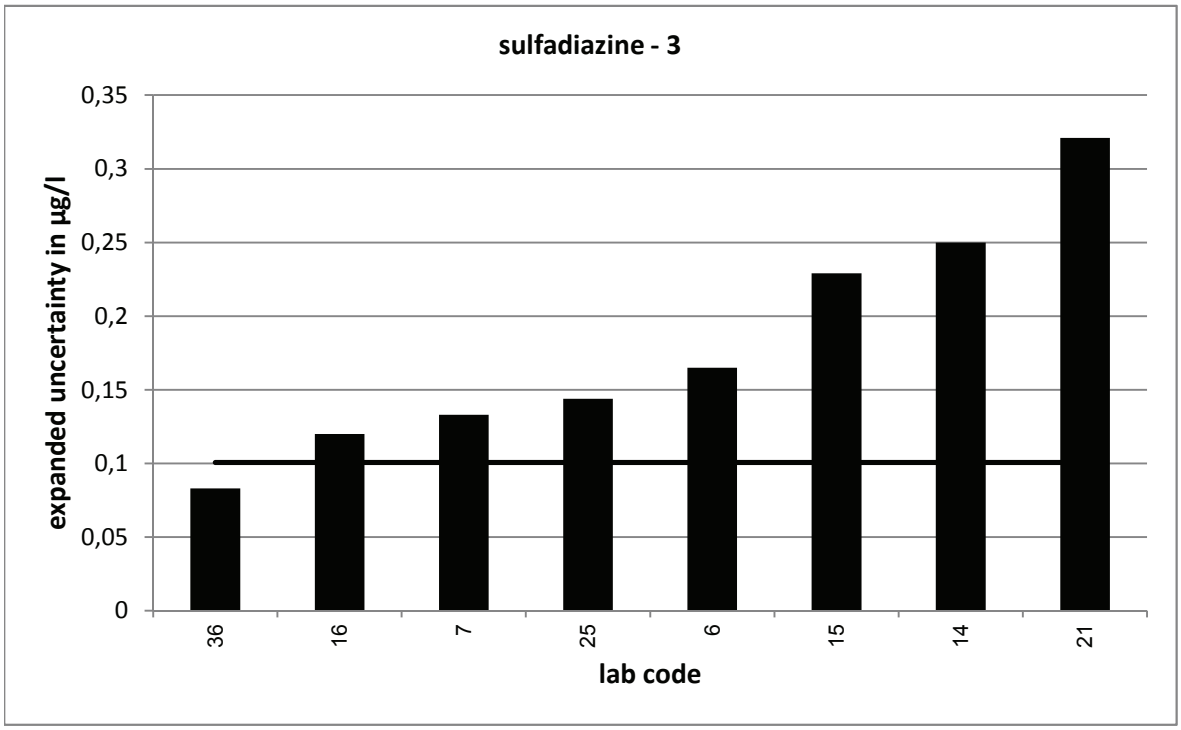

sulfadiazine - 2
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
6
25
16
36
7
21
15
14
lab code

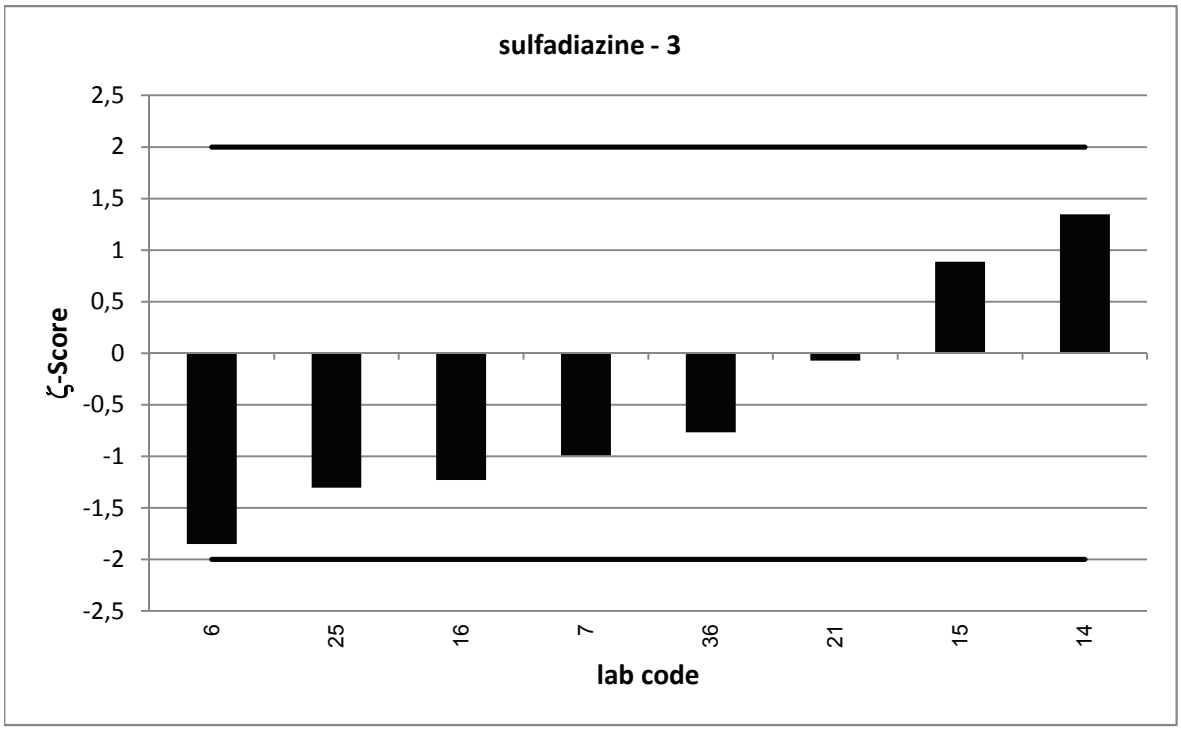
| PT 5/16 - TW S2 | | sulfadiazine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,8133 | ± 0,0147 | | |
| upper tolerance limit [µg/l] | | 1,029 | | | |
| lower tolerance limit [µg/l] | | 0,6231 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,881 | | | 0,6 | s |
| 3 | 0,436 | | | -4,0 | u |
| 5 | 0,7651 | | | -0,5 | s |
| 6 | 0,66 | 0,165 | -1,9 | -1,6 | s |
| 7 | 0,747 | 0,133 | -1,0 | -0,7 | s |
| 9 | 0,825 | | | 0,1 | s |
| 10 | 0,692 | | | -1,3 | s |
| 14 | 0,982 | 0,25 | 1,3 | 1,6 | s |
| 15 | 0,915 | 0,229 | 0,9 | 0,9 | s |
| 16 | 0,739 | 0,12 | -1,2 | -0,8 | s |
| 17 | 0,724 | | | -0,9 | s |
| 19 | 0,827 | | | 0,1 | s |
| 20 | 0,741 | | | -0,8 | s |
| 21 | 0,802 | 0,321 | -0,1 | -0,1 | s |
| 23 | 0,825 | | | 0,1 | s |
| 25 | 0,719 | 0,144 | -1,3 | -1,0 | s |
| 26 | 0,798 | | | -0,2 | s |
| 31 | 0,811 | | | 0,0 | s |
| 32 | 0,84 | | | 0,2 | s |
| 35 | 2,79 | | | 18,3 | u |
| 36 | 0,781 | 0,083 | -0,8 | -0,3 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfadiazine - 3
concentration in µg/l
3
2,5
2
1,5
1
0,5
0
3 6 10 25 17 16 20 7 5 36 26 21 31 9 23 19 32 2 15 14 35
lab code


sulfadiazine - 3
$z_U$-score
20
15
10
5
0
-5
-10
3 6 10 25 17 16 20 7 5 36 26 21 31 9 23 19 32 2 15 14 35
lab code

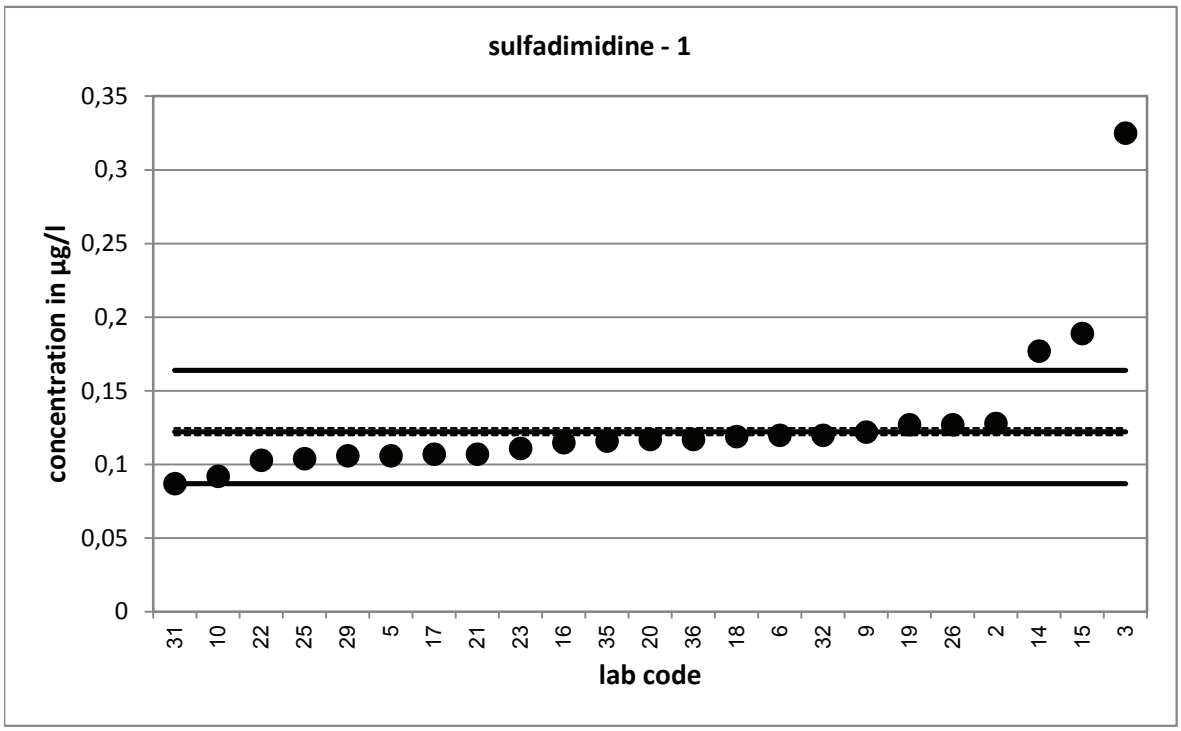

sulfadiazine - 3
expanded uncertainty in µg/l
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
36
16
7
25
6
15
14
21
lab code

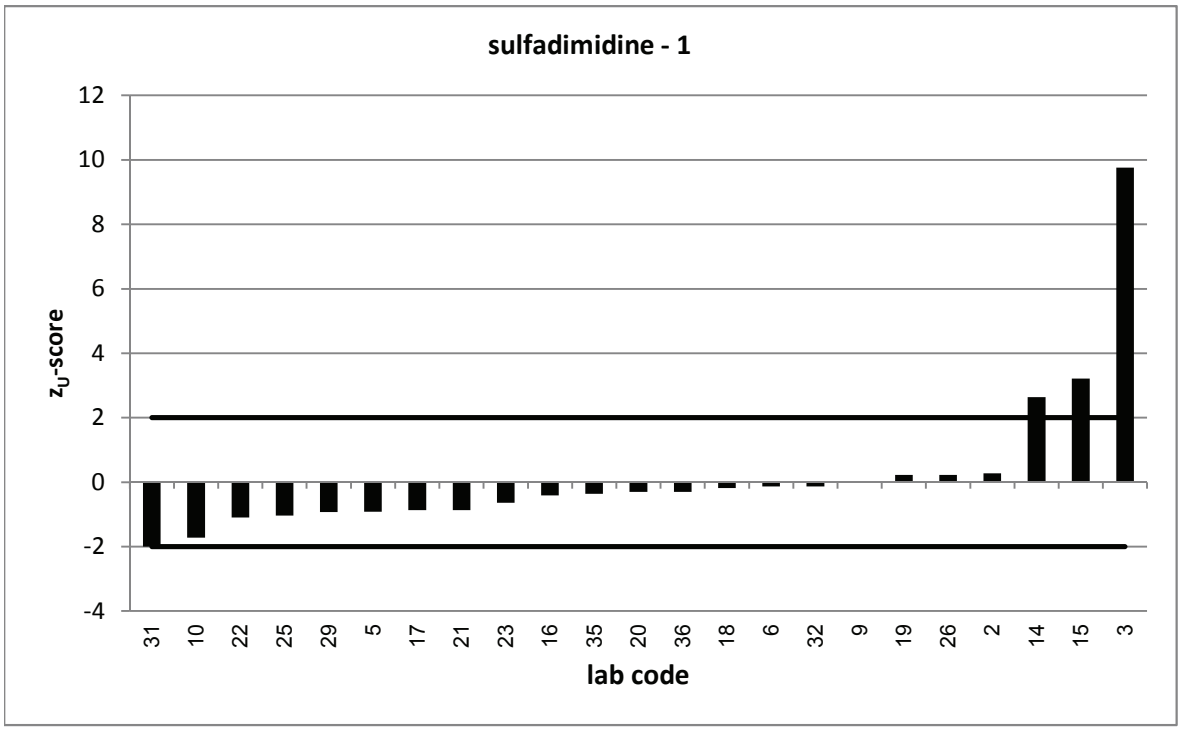

sulfadiazine - 3
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
6
25
16
7
36
21
15
14
lab code

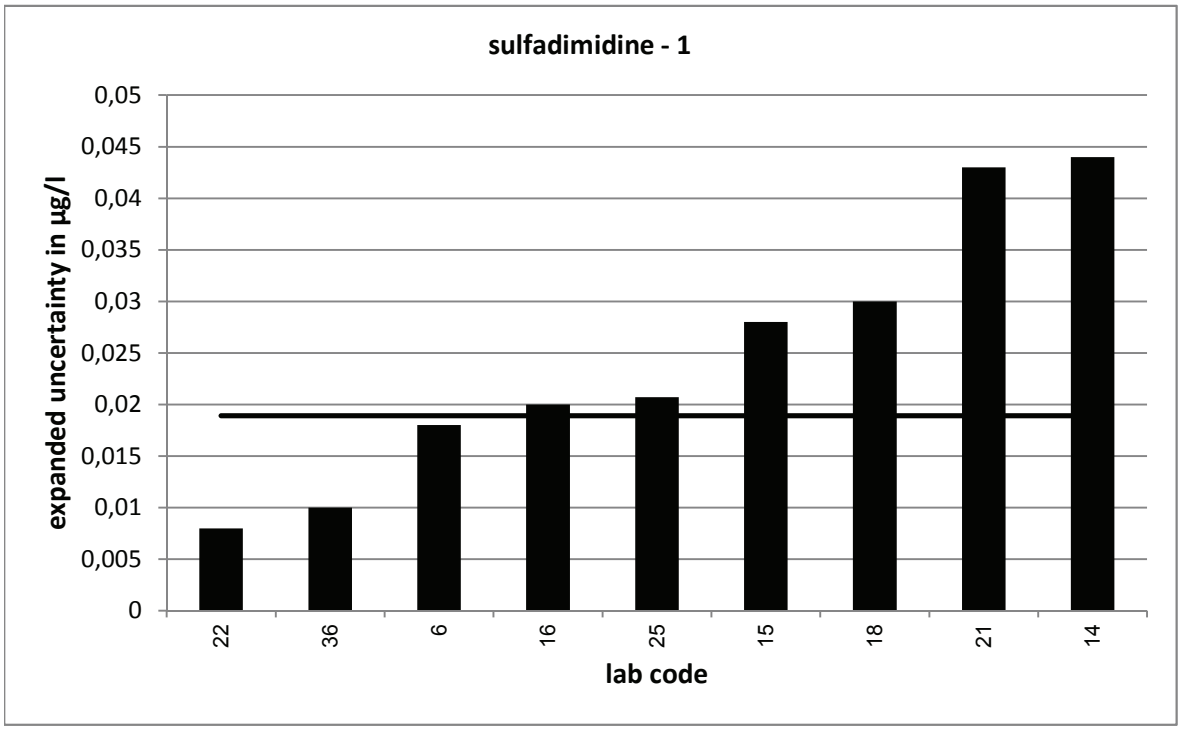
| PT 5/16 - TW S2 | | sulfadimidine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1223 | ± 0,0023 | | |
| upper tolerance limit [µg/l] | | 0,1638 | | | |
| lower tolerance limit [µg/l] | | 0,08707 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,128 | | | 0,3 | s |
| 3 | 0,325 | | | 9,8 | u |
| 5 | 0,1061 | | | -0,9 | s |
| 6 | 0,12 | 0,018 | -0,3 | -0,1 | s |
| 9 | 0,122 | | | 0,0 | s |
| 10 | 0,092 | | | -1,7 | s |
| 14 | 0,177 | 0,044 | 2,5 | 2,6 | q |
| 15 | 0,189 | 0,028 | 4,7 | 3,2 | u |
| 16 | 0,115 | 0,02 | -0,7 | -0,4 | s |
| 17 | 0,107 | | | -0,9 | s |
| 18 | 0,119 | 0,03 | -0,2 | -0,2 | s |
| 19 | 0,127 | | | 0,2 | s |
| 20 | 0,117 | | | -0,3 | s |
| 21 | 0,107 | 0,043 | -0,7 | -0,9 | s |
| 22 | 0,103 | 0,008 | -4,6 | -1,1 | s |
| 23 | 0,111 | | | -0,6 | s |
| 25 | 0,104 | 0,021 | -1,8 | -1,0 | s |
| 26 | 0,127 | | | 0,2 | s |
| 29 | 0,106 | | | -0,9 | s |
| 31 | 0,087 | | | -2,0 | s |
| 32 | 0,12 | | | -0,1 | s |
| 35 | 0,116 | | | -0,4 | s |
| 36 | 0,117 | 0,01 | -1,0 | -0,3 | s |

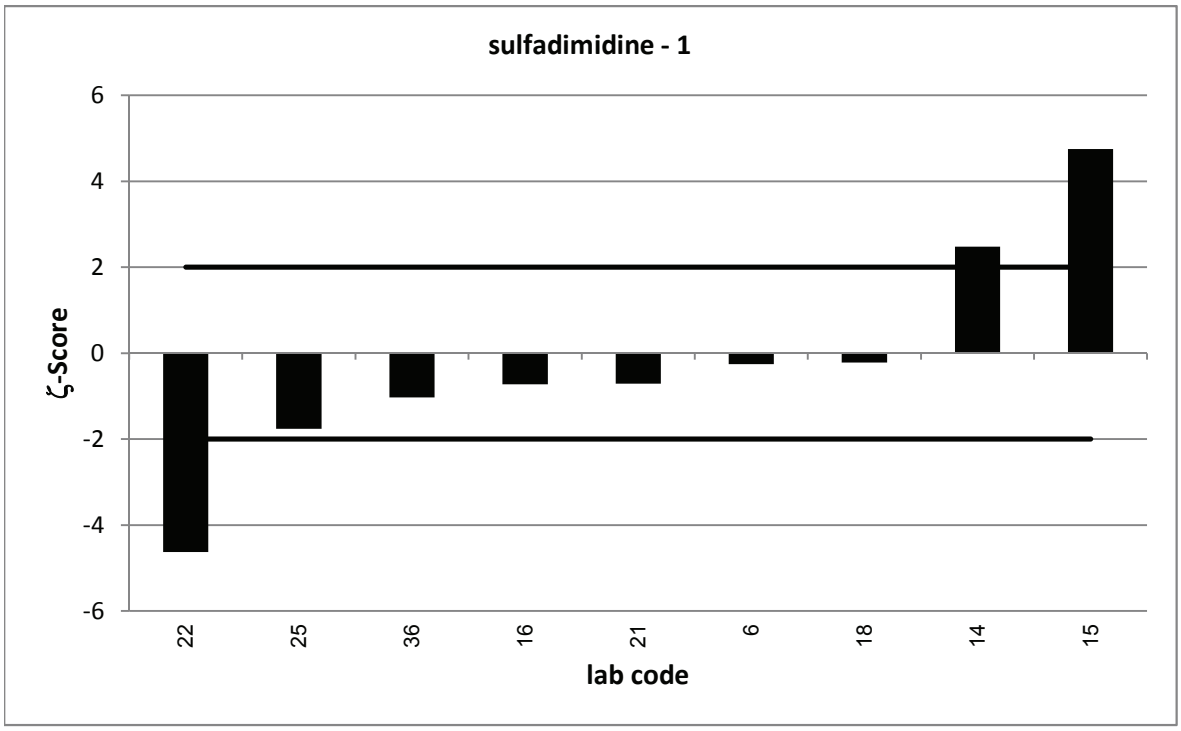
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadimidine - 1
concentration in µg/l
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
31 10 22 25 29 5 17 21 23 16 35 20 36 18 6 32 9 19 26 2 14 15 3
lab code


sulfadimidine - 1
$z_U$-score
12
10
8
6
4
2
0
-2
-4
31 10 22 25 29 5 17 21 23 16 35 20 36 18 6 32 9 19 26 2 14 15 3
lab code

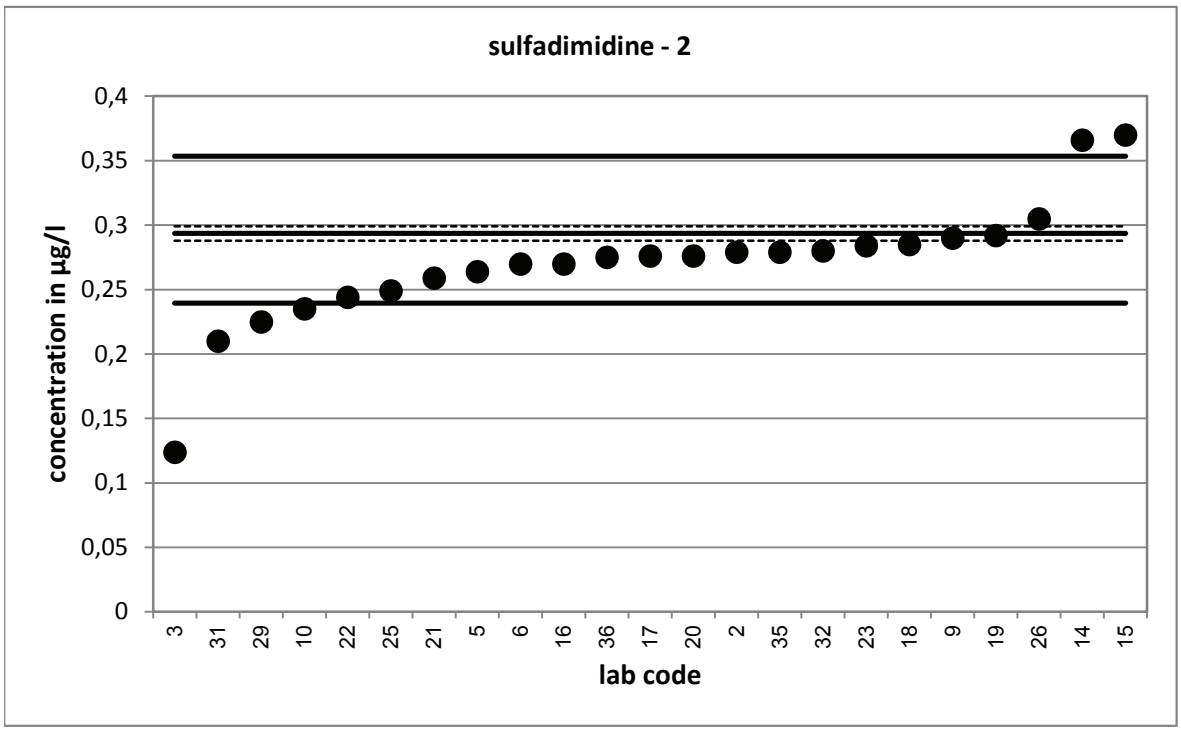

sulfadimidine - 1
expanded uncertainty in µg/l
0,05
0,045
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
22
36
6
16
25
15
18
21
14
lab code

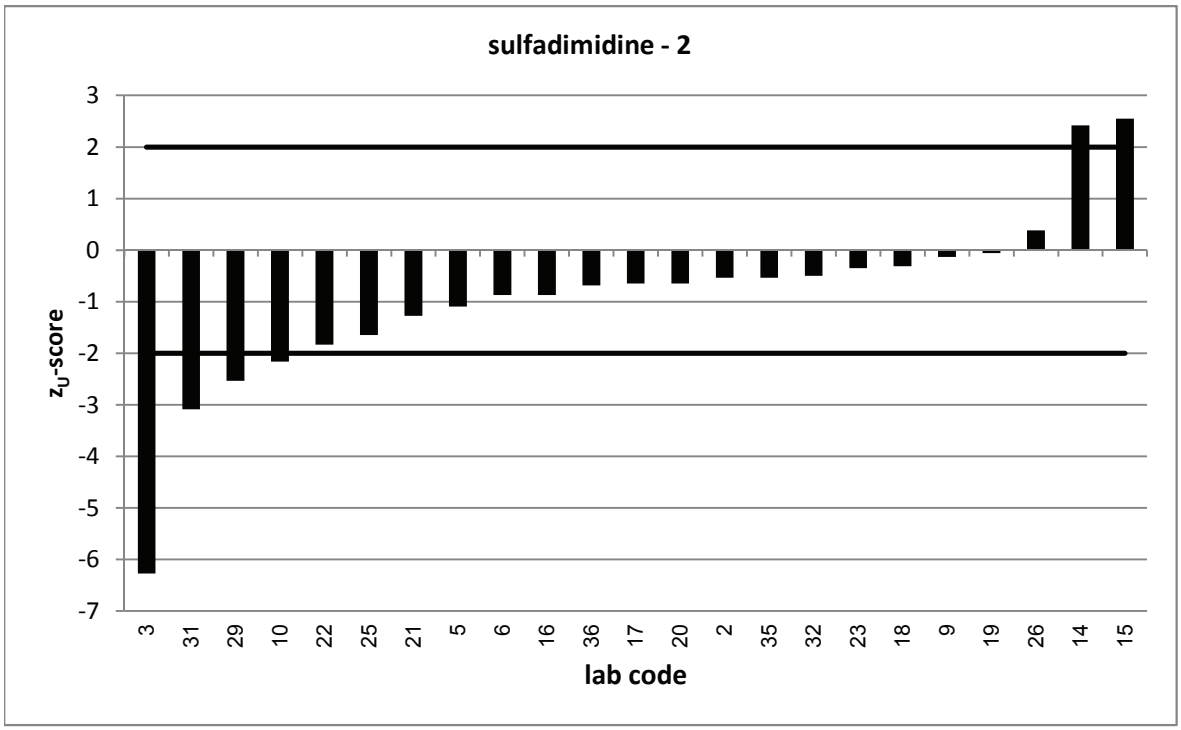

sulfadimidine - 1
ζ-Score
6
4
2
0
-2
-4
-6
22
25
36
16
21
6
18
14
15
lab code

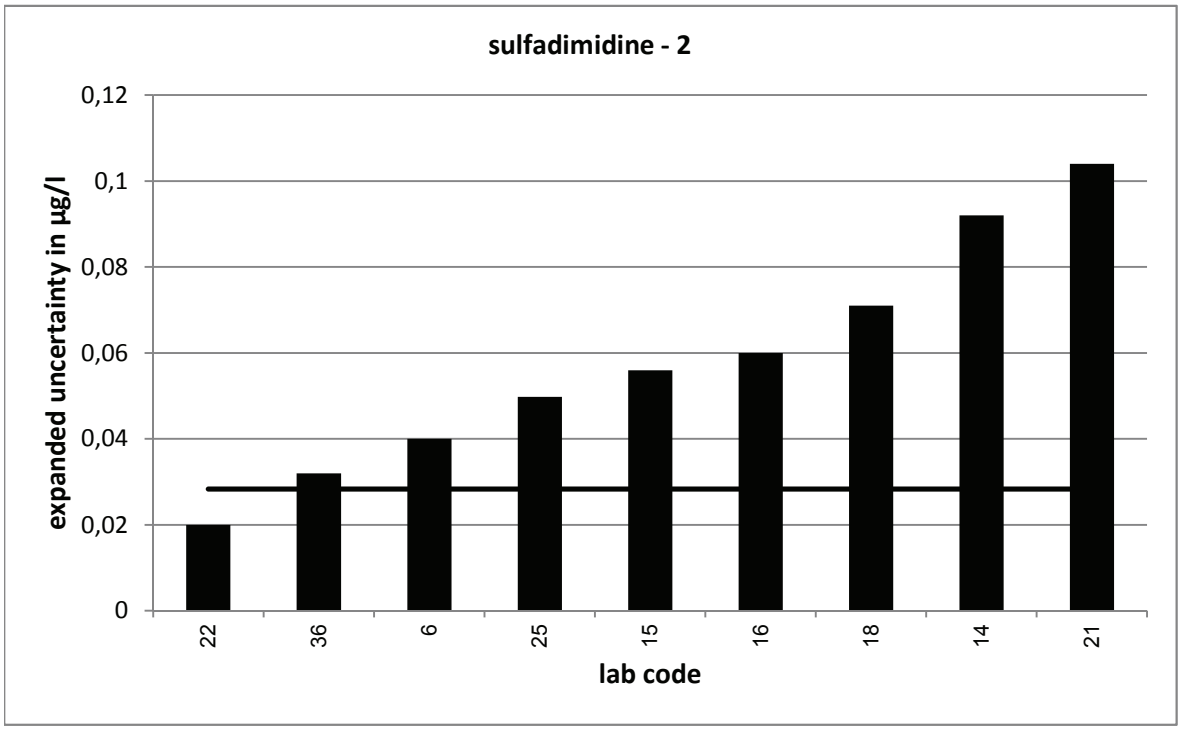
| PT 5/16 - TW S2 | | sulfadimidine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,2935 | ± 0,0056 | | |
| upper tolerance limit [µg/l] | | 0,3535 | | | |
| lower tolerance limit [µg/l] | | 0,2394 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,279 | | | -0,5 | s |
| 3 | 0,124 | | | -6,3 | u |
| 5 | 0,2639 | | | -1,1 | s |
| 6 | 0,27 | 0,04 | -1,2 | -0,9 | s |
| 9 | 0,29 | | | -0,1 | s |
| 10 | 0,235 | | | -2,2 | q |
| 14 | 0,366 | 0,092 | 1,6 | 2,4 | q |
| 15 | 0,37 | 0,056 | 2,7 | 2,6 | q |
| 16 | 0,27 | 0,06 | -0,8 | -0,9 | s |
| 17 | 0,276 | | | -0,6 | s |
| 18 | 0,285 | 0,071 | -0,2 | -0,3 | s |
| 19 | 0,292 | | | -0,1 | s |
| 20 | 0,276 | | | -0,6 | s |
| 21 | 0,259 | 0,104 | -0,7 | -1,3 | s |
| 22 | 0,244 | 0,02 | -4,8 | -1,8 | s |
| 23 | 0,284 | | | -0,4 | s |
| 25 | 0,249 | 0,05 | -1,8 | -1,6 | s |
| 26 | 0,305 | | | 0,4 | s |
| 29 | 0,225 | | | -2,5 | q |
| 31 | 0,21 | | | -3,1 | u |
| 32 | 0,28 | | | -0,5 | s |
| 35 | 0,279 | | | -0,5 | s |
| 36 | 0,275 | 0,032 | -1,1 | -0,7 | s |

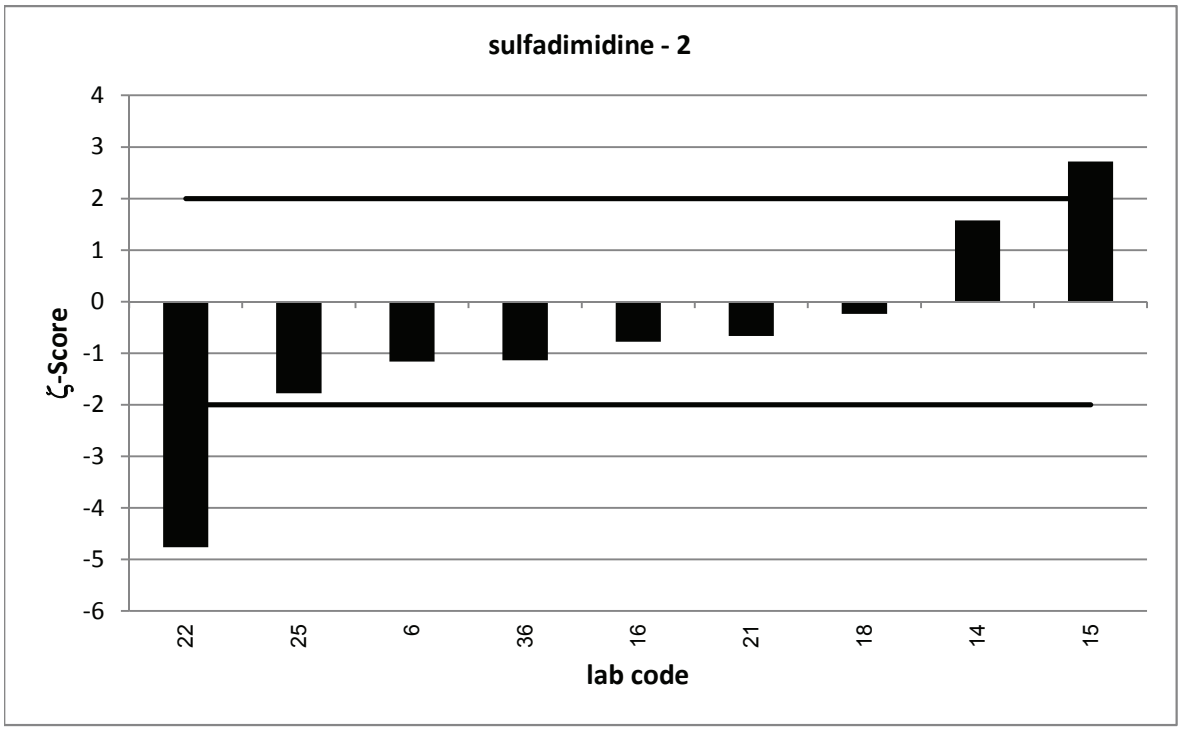
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadimidine - 2
concentration in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
3
31
29
10
22
25
21
5
6
16
36
17
20
2
35
32
23
18
9
19
26
14
15
lab code


sulfadimidine - 2
$z_U$-score
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
3
31
29
10
22
25
21
5
6
16
36
17
20
2
35
32
23
18
9
19
26
14
15
lab code

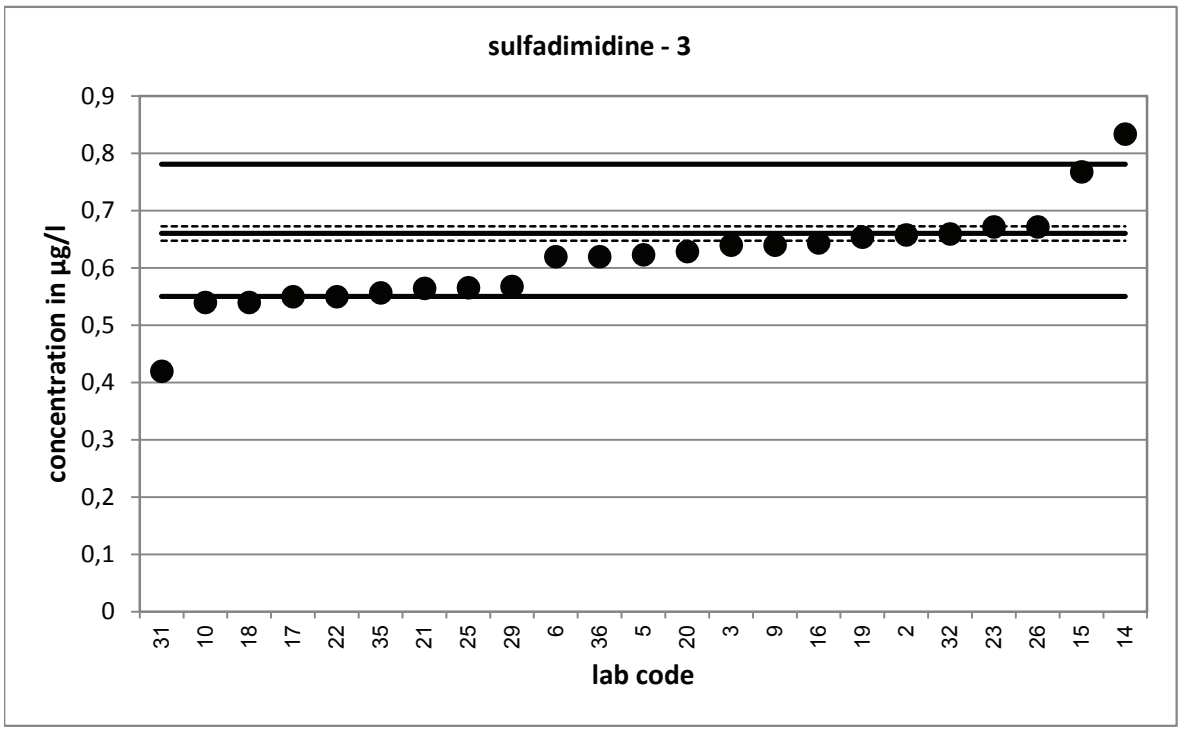

sulfadimidine - 2
expanded uncertainty in µg/l
0,12
0,1
0,08
0,06
0,04
0,02
0
22
36
6
25
15
16
18
14
21
lab code

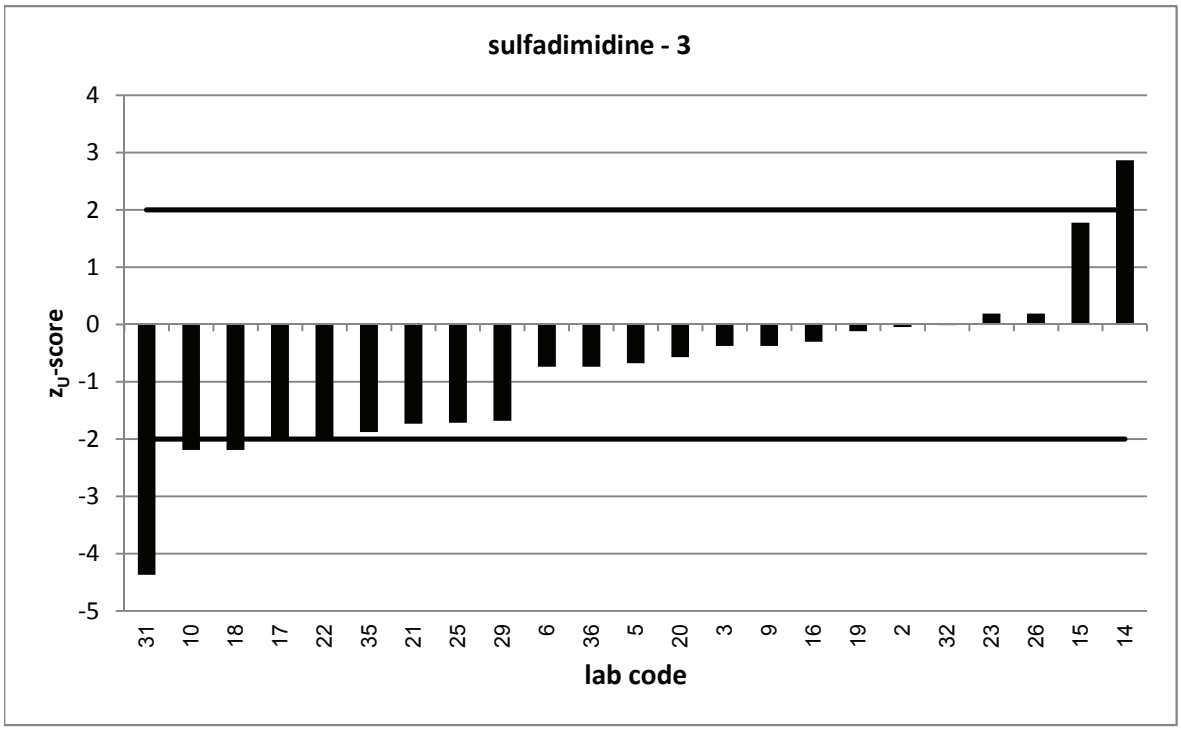

sulfadimidine - 2
ζ-Score
4
3
2
1
0
-1
-2
-3
-4
-5
-6
22
25
6
36
16
21
18
14
15
lab code

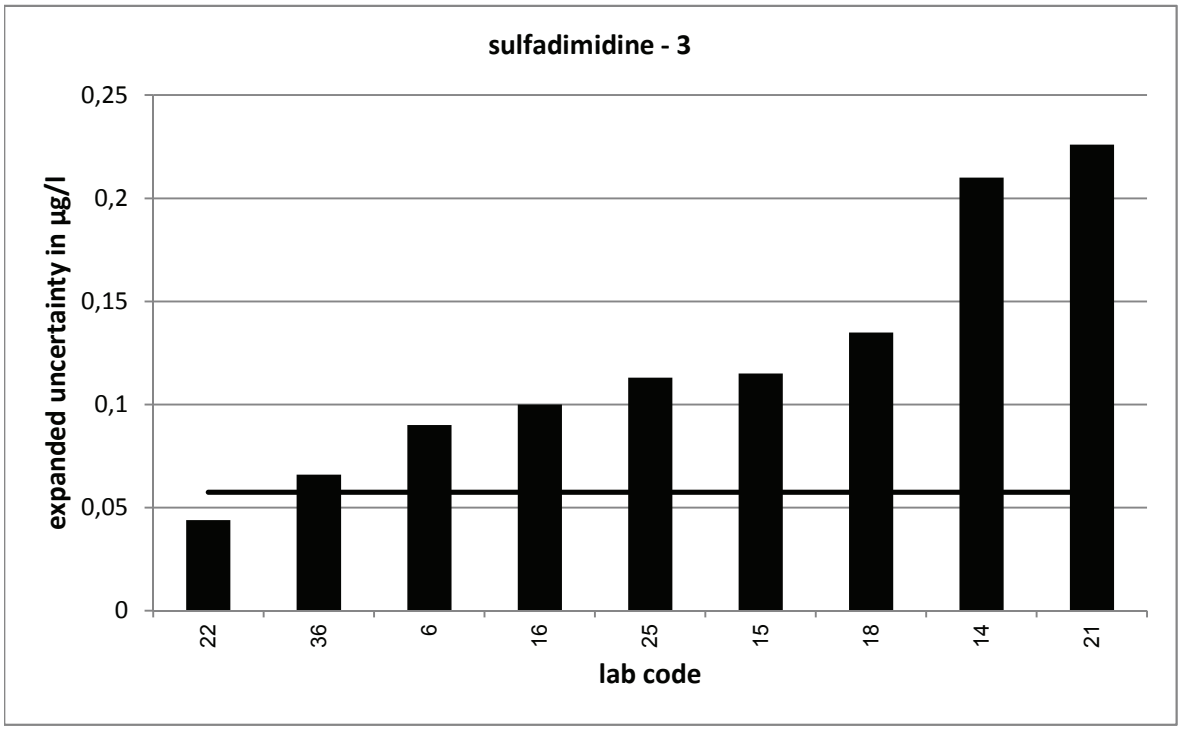
| PT 5/16 - TW S2 | | sulfadimidine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,6604 | ± 0,0126 | | |
| upper tolerance limit [µg/l] | | 0,7813 | | | |
| lower tolerance limit [µg/l] | | 0,5502 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,658 | | | 0,0 | s |
| 3 | 0,64 | | | -0,4 | s |
| 5 | 0,6233 | | | -0,7 | s |
| 6 | 0,62 | 0,09 | -0,9 | -0,7 | s |
| 9 | 0,64 | | | -0,4 | s |
| 10 | 0,54 | | | -2,2 | q |
| 14 | 0,834 | 0,21 | 1,7 | 2,9 | q |
| 15 | 0,768 | 0,115 | 1,9 | 1,8 | s |
| 16 | 0,644 | 0,1 | -0,3 | -0,3 | s |
| 17 | 0,55 | | | -2,0 | s |
| 18 | 0,54 | 0,135 | -1,8 | -2,2 | q |
| 19 | 0,654 | | | -0,1 | s |
| 20 | 0,629 | | | -0,6 | s |
| 21 | 0,565 | 0,226 | -0,8 | -1,7 | s |
| 22 | 0,55 | 0,044 | -4,8 | -2,0 | s |
| 23 | 0,672 | | | 0,2 | s |
| 25 | 0,566 | 0,113 | -1,7 | -1,7 | s |
| 26 | 0,672 | | | 0,2 | s |
| 29 | 0,568 | | | -1,7 | s |
| 31 | 0,42 | | | -4,4 | u |
| 32 | 0,66 | | | 0,0 | s |
| 35 | 0,557 | | | -1,9 | s |
| 36 | 0,62 | 0,066 | -1,2 | -0,7 | s |

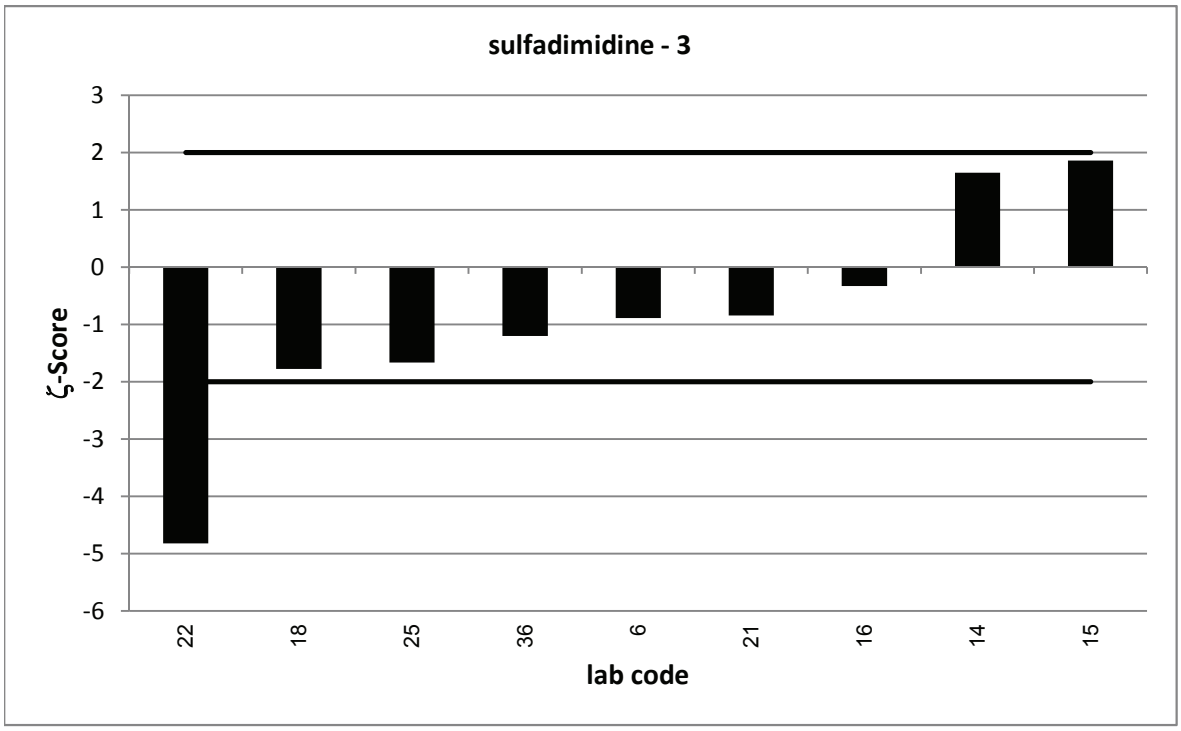
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadimidine - 3
concentration in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
31 10 18 17 22 35 21 25 29 6 36 5 20 3 9 16 19 2 32 23 26 15 14
lab code


sulfadimidine - 3
$z_U$-score
4
3
2
1
0
-1
-2
-3
-4
-5
31 10 18 17 22 35 21 25 29 6 36 5 20 3 9 16 19 2 32 23 26 15 14
lab code

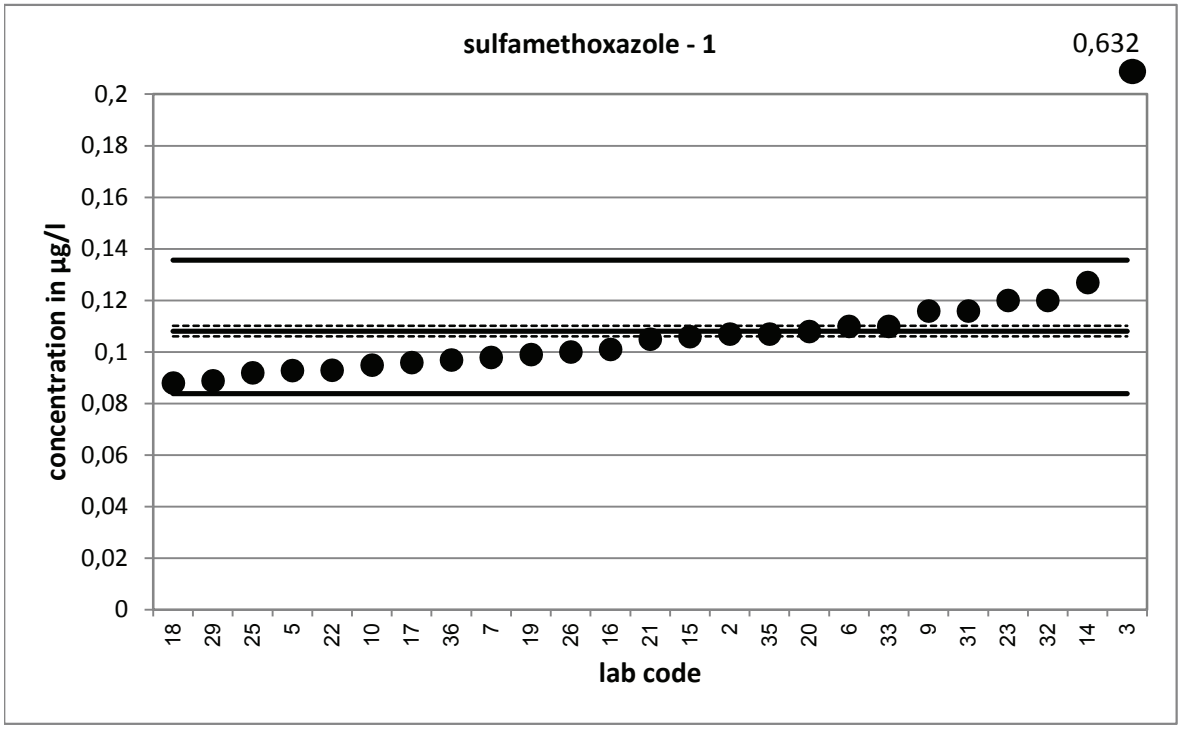

sulfadimidine - 3
expanded uncertainty in µg/l
0,25
0,2
0,15
0,1
0,05
0
22
36
6
16
25
15
18
14
21
lab code

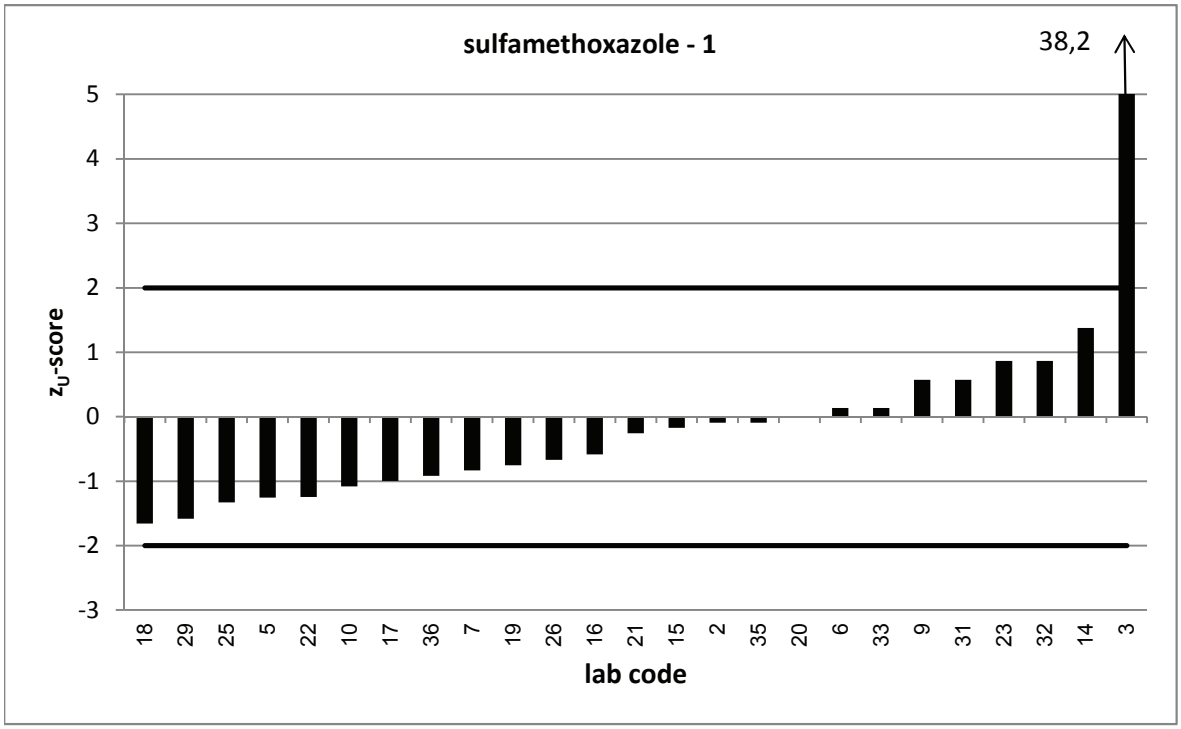

sulfadimidine - 3
ζ-Score
3
2
1
0
-1
-2
-3
-4
-5
-6
22
18
25
36
6
21
16
14
15
lab code

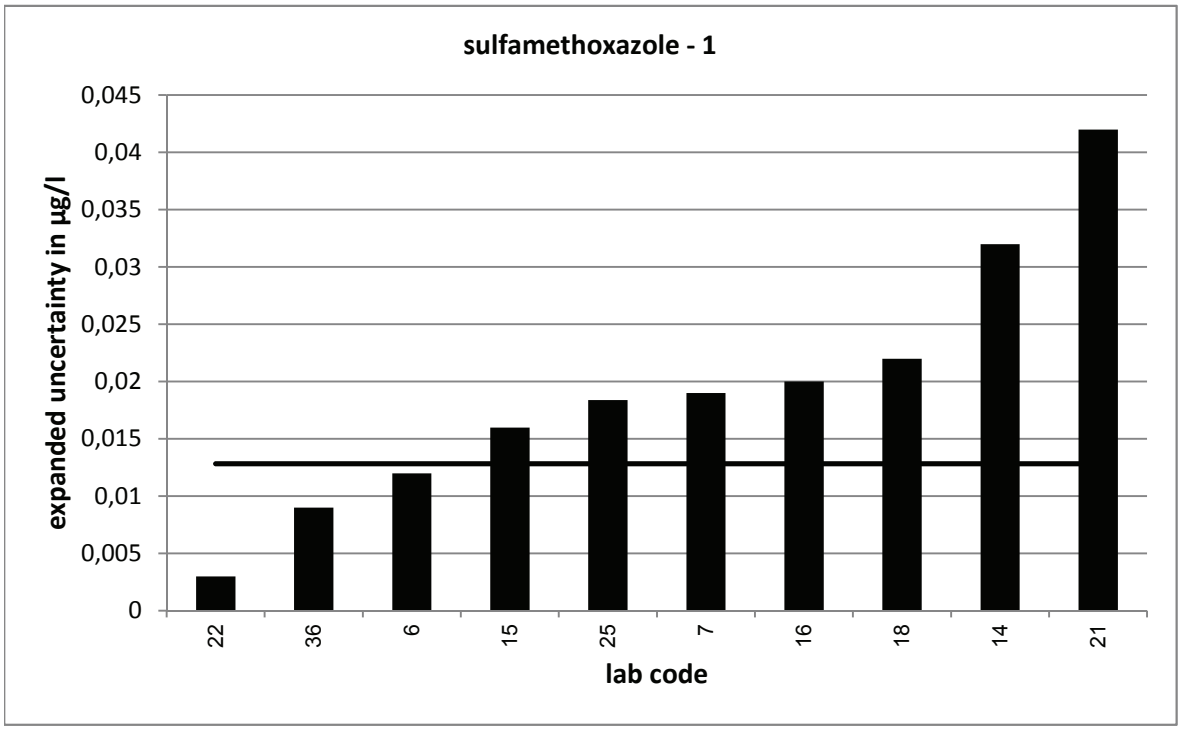
| PT 5/16 - TW S2 | | sulfamethoxazole - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1081 | ± 0,002 | | |
| upper tolerance limit [µg/l] | | 0,1356 | | | |
| lower tolerance limit [µg/l] | | 0,08384 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,107 | | | -0,1 | s |
| 3 | 0,632 | | | 38,2 | u |
| 5 | 0,0929 | | | -1,3 | s |
| 6 | 0,11 | 0,012 | 0,3 | 0,1 | s |
| 7 | 0,098 | 0,019 | -1,1 | -0,8 | s |
| 9 | 0,116 | | | 0,6 | s |
| 10 | 0,095 | | | -1,1 | s |
| 14 | 0,127 | 0,032 | 1,2 | 1,4 | s |
| 15 | 0,106 | 0,016 | -0,3 | -0,2 | s |
| 16 | 0,101 | 0,02 | -0,7 | -0,6 | s |
| 17 | 0,096 | | | -1,0 | s |
| 18 | 0,088 | 0,022 | -1,8 | -1,7 | s |
| 19 | 0,099 | | | -0,8 | s |
| 20 | 0,108 | | | 0,0 | s |
| 21 | 0,105 | 0,042 | -0,1 | -0,3 | s |
| 22 | 0,093 | 0,003 | -8,4 | -1,2 | s |
| 23 | 0,12 | | | 0,9 | s |
| 25 | 0,092 | 0,018 | -1,7 | -1,3 | s |
| 26 | 0,1 | | | -0,7 | s |
| 29 | 0,0889 | | | -1,6 | s |
| 31 | 0,116 | | | 0,6 | s |
| 32 | 0,12 | | | 0,9 | s |
| 33 | 0,11 | | | 0,1 | s |
| 35 | 0,107 | | | -0,1 | s |
| 36 | 0,097 | 0,009 | -2,4 | -0,9 | s |

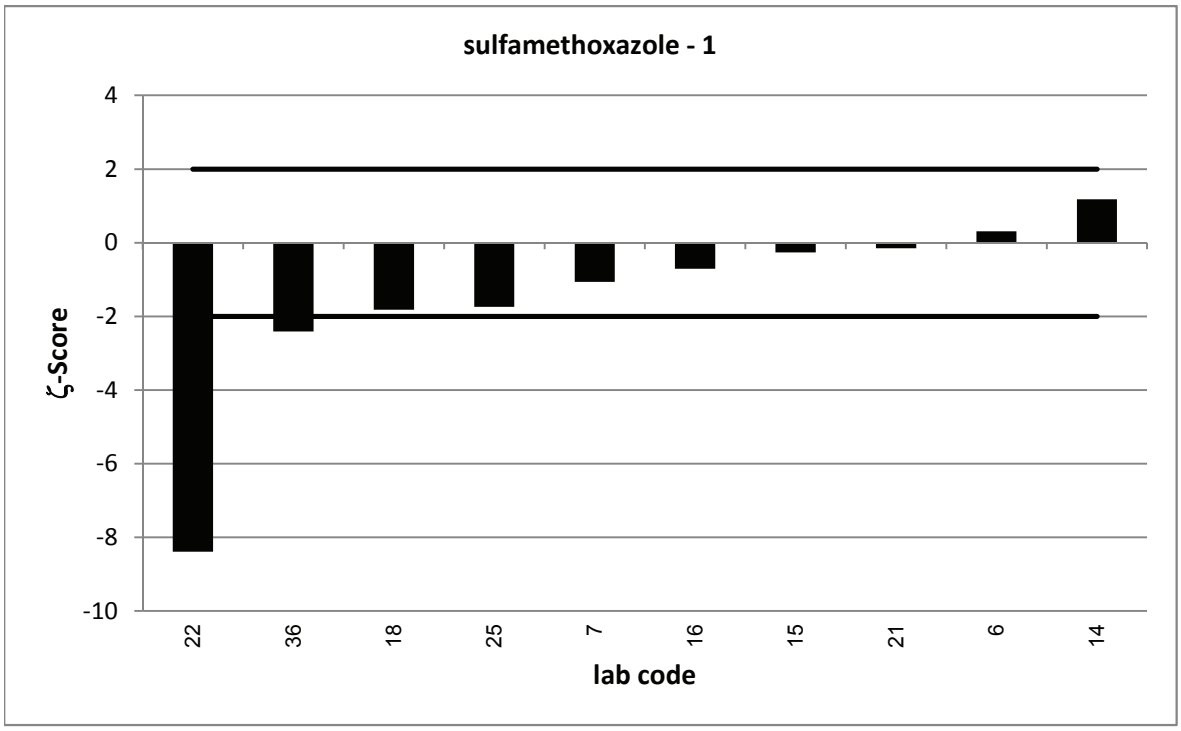
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfamethoxazole - 1
0,632
concentration in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
18 29 25 5 22 10 17 36 7 19 26 16 21 15 2 35 20 6 33 9 31 23 32 14 3
lab code


sulfamethoxazole - 1
38,2
$z_U$-score
5
4
3
2
1
0
-1
-2
-3
18 29 25 5 22 10 17 36 7 19 26 16 21 15 2 35 20 6 33 9 31 23 32 14 3
lab code

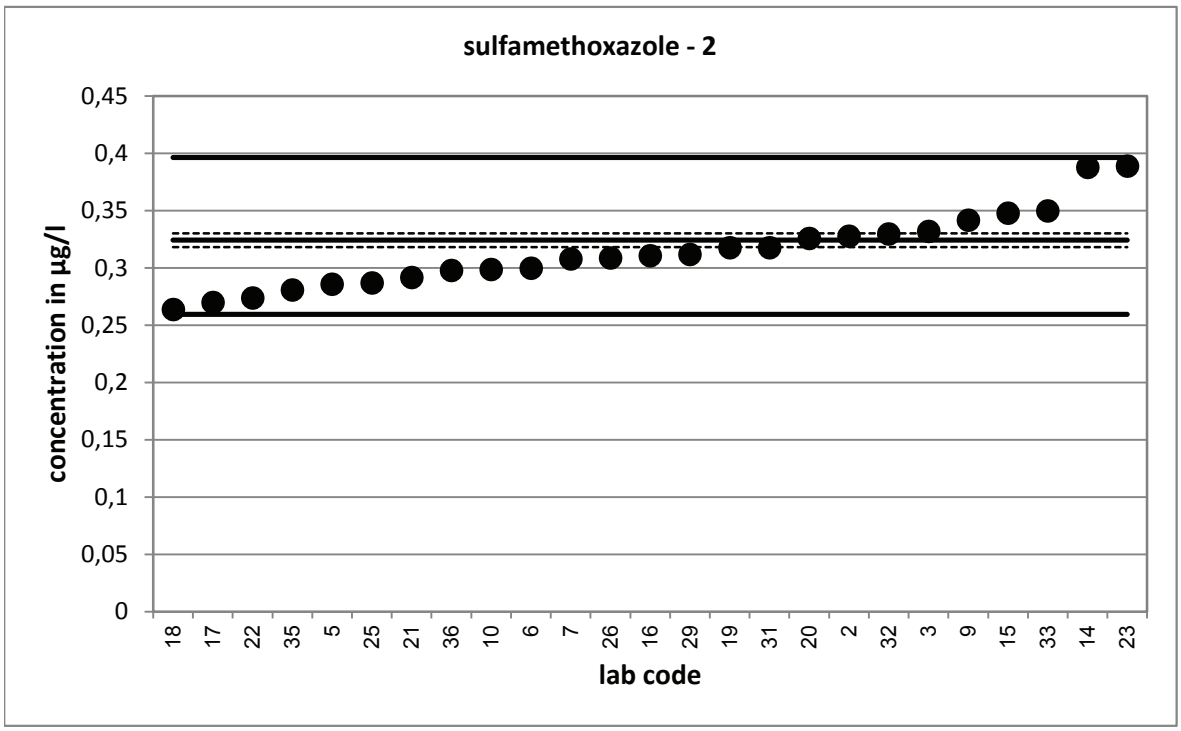

sulfamethoxazole - 1
expanded uncertainty in µg/l
0,045
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
22
36
6
15
25
7
16
18
14
21
lab code

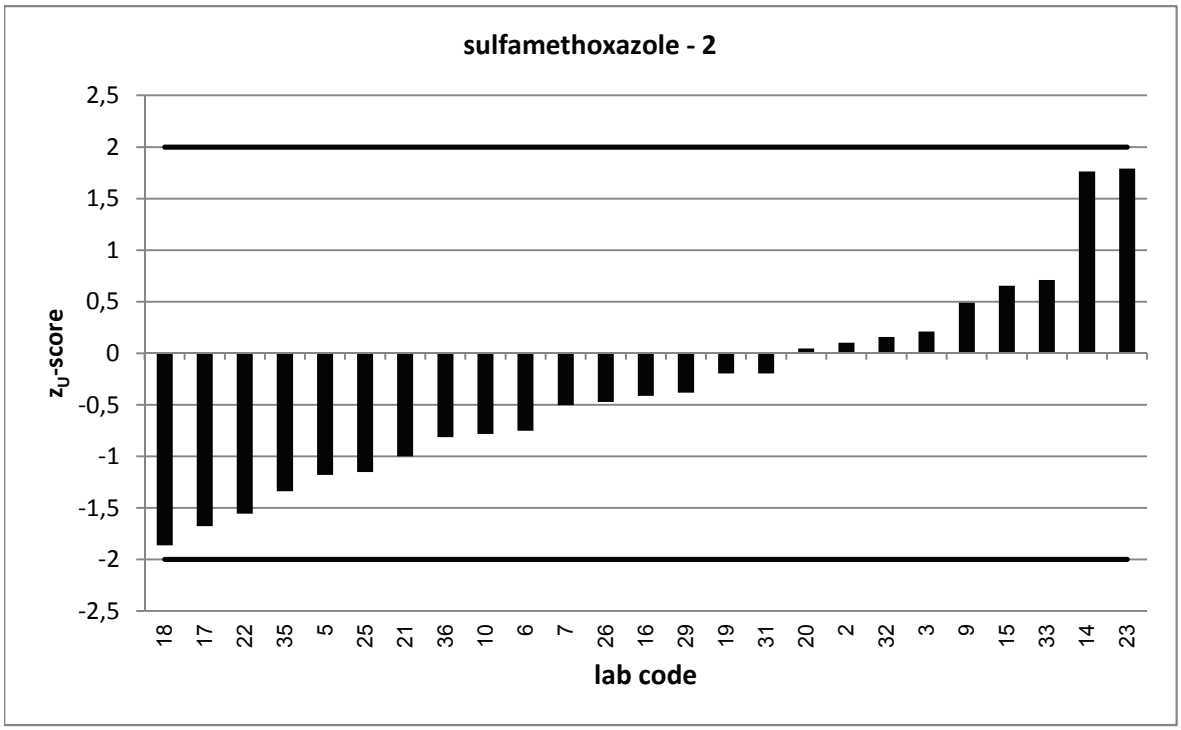

sulfamethoxazole - 1
ζ-Score
4
2
0
-2
-4
-6
-8
-10
22
36
18
25
7
16
15
21
6
14
lab code

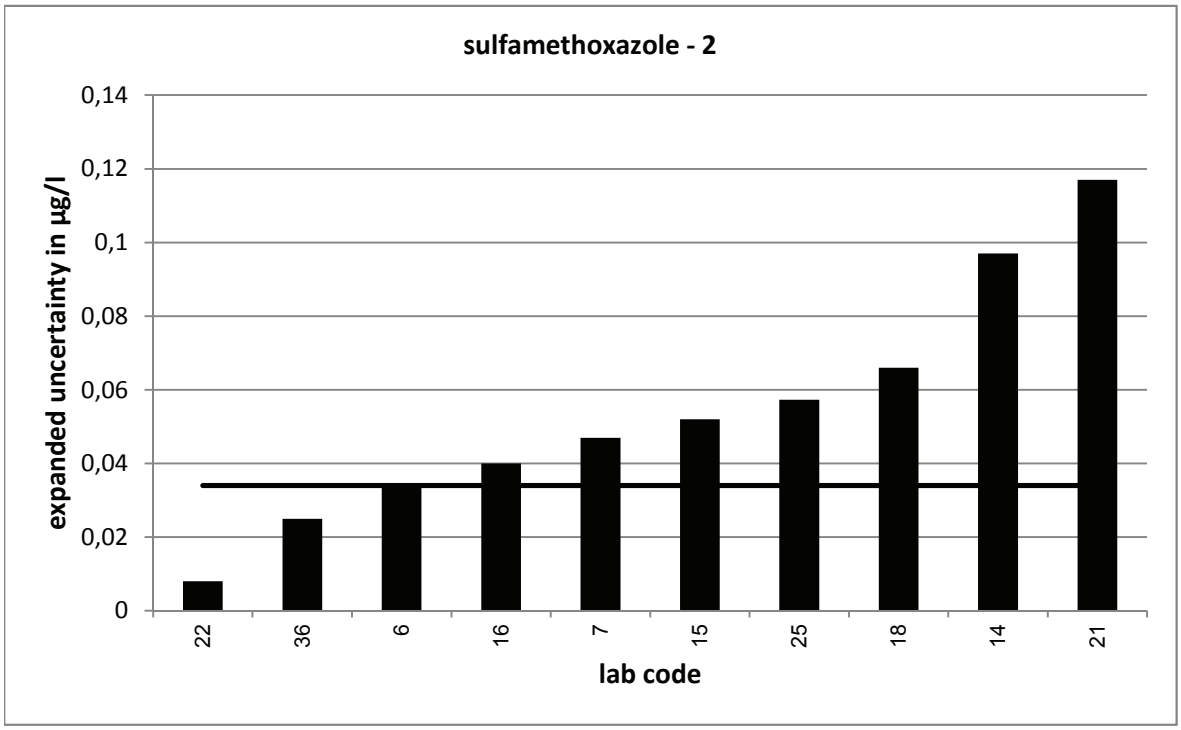
| PT 5/16 - TW S2 | | sulfamethoxazole - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,3243 | ± 0,006 | | |
| upper tolerance limit [µg/l] | | 0,3965 | | | |
| lower tolerance limit [µg/l] | | 0,2596 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,328 | | | 0,1 | s |
| 3 | 0,332 | | | 0,2 | s |
| 5 | 0,2861 | | | -1,2 | s |
| 6 | 0,3 | 0,034 | -1,4 | -0,8 | s |
| 7 | 0,308 | 0,047 | -0,7 | -0,5 | s |
| 9 | 0,342 | | | 0,5 | s |
| 10 | 0,299 | | | -0,8 | s |
| 14 | 0,388 | 0,097 | 1,3 | 1,8 | s |
| 15 | 0,348 | 0,052 | 0,9 | 0,7 | s |
| 16 | 0,311 | 0,04 | -0,7 | -0,4 | s |
| 17 | 0,27 | | | -1,7 | s |
| 18 | 0,264 | 0,066 | -1,8 | -1,9 | s |
| 19 | 0,318 | | | -0,2 | s |
| 20 | 0,326 | | | 0,0 | s |
| 21 | 0,292 | 0,117 | -0,6 | -1,0 | s |
| 22 | 0,274 | 0,008 | -10,1 | -1,6 | s |
| 23 | 0,389 | | | 1,8 | s |
| 25 | 0,287 | 0,057 | -1,3 | -1,2 | s |
| 26 | 0,309 | | | -0,5 | s |
| 29 | 0,312 | | | -0,4 | s |
| 31 | 0,318 | | | -0,2 | s |
| 32 | 0,33 | | | 0,2 | s |
| 33 | 0,35 | | | 0,7 | s |
| 35 | 0,281 | | | -1,3 | s |
| 36 | 0,298 | 0,025 | -2,0 | -0,8 | s |

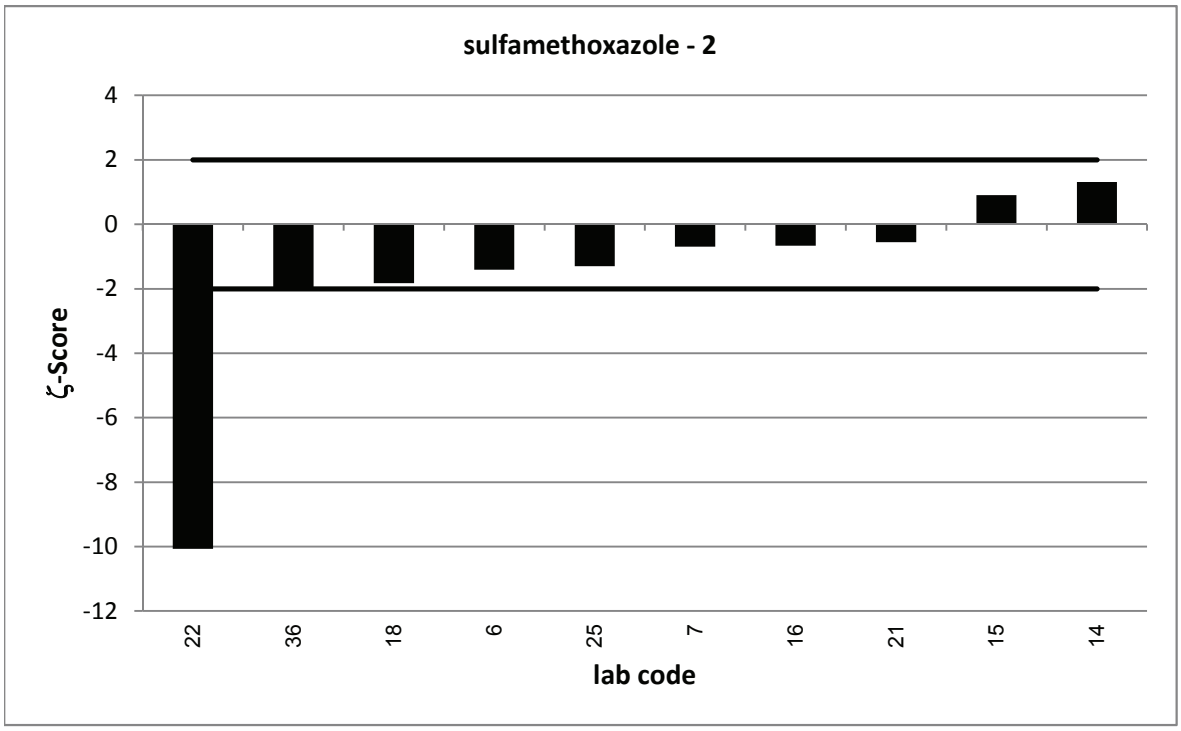
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfamethoxazole - 2
concentration in µg/l
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
18 17 22 35 5 25 21 36 10 6 7 26 16 29 19 31 20 2 32 3 9 15 33 14 23
lab code


sulfamethoxazole - 2
$z_U$-score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
18 17 22 35 5 25 21 36 10 6 7 26 16 29 19 31 20 2 32 3 9 15 33 14 23
lab code

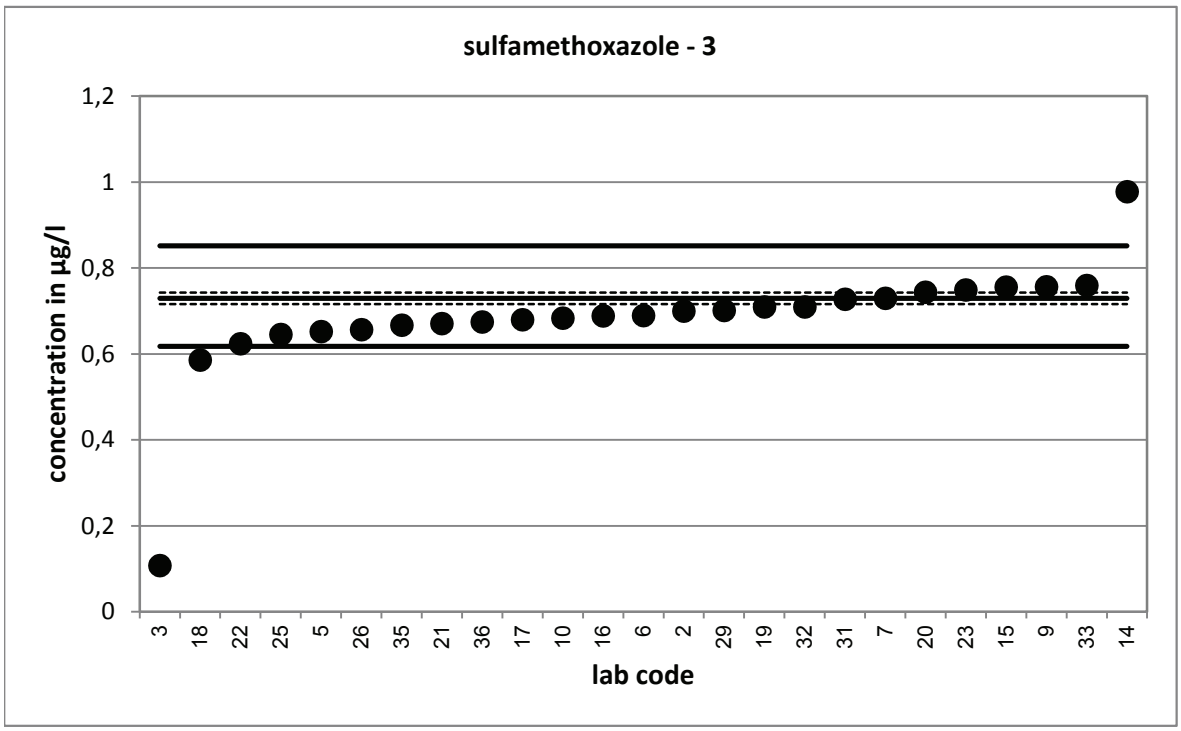

sulfamethoxazole - 2
expanded uncertainty in µg/l
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
22
36
6
16
7
15
25
18
14
21
lab code

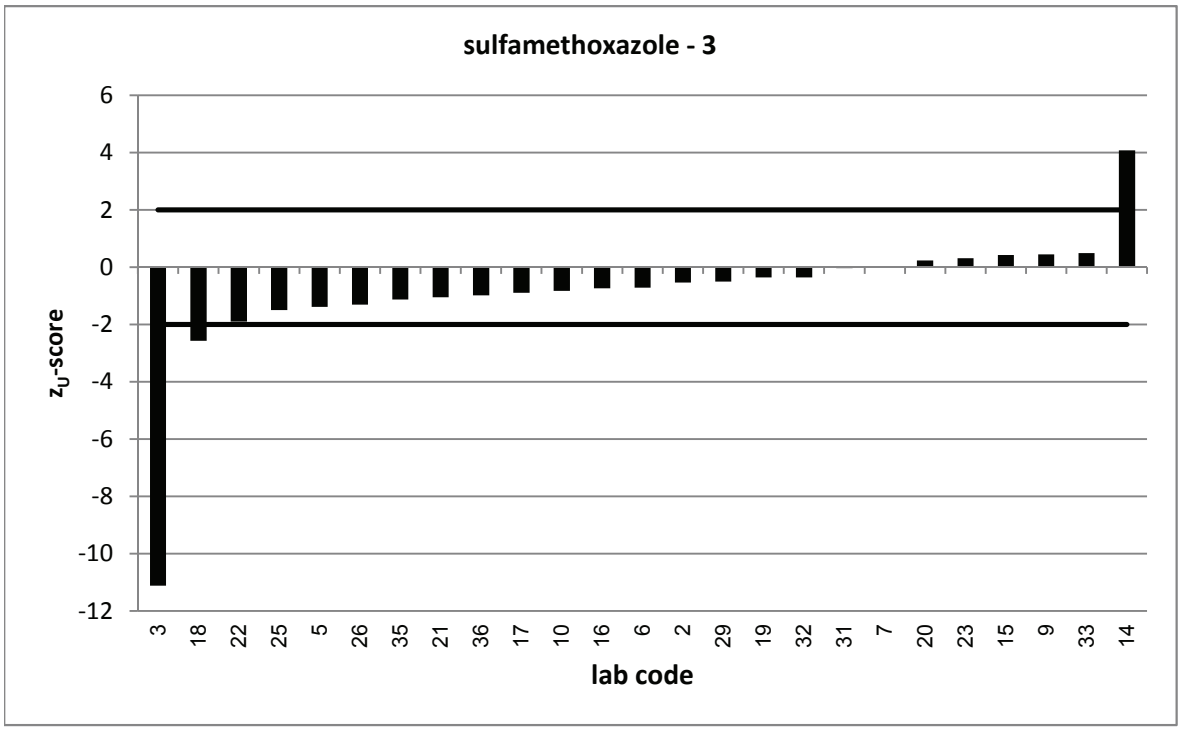

sulfamethoxazole - 2
ζ-Score
4
2
0
-2
-4
-6
-8
-10
-12
22
36
18
6
25
7
16
21
15
14
lab code

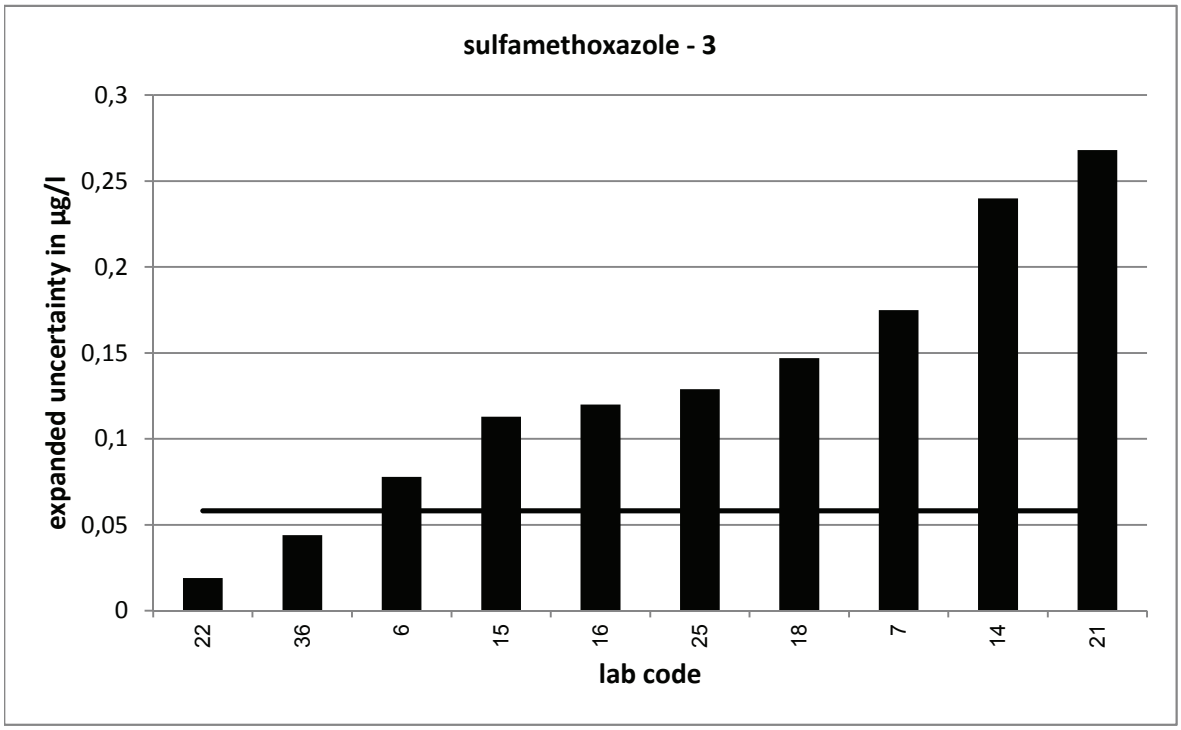
| PT 5/16 - TW S2 | | sulfamethoxazole - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,7298 | ± 0,0135 | | |
| upper tolerance limit [µg/l] | | 0,8514 | | | |
| lower tolerance limit [µg/l] | | 0,6178 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,7 | | | -0,5 | s |
| 3 | 0,108 | | | -11,1 | u |
| 5 | 0,6523 | | | -1,4 | s |
| 6 | 0,69 | 0,078 | -1,0 | -0,7 | s |
| 7 | 0,73 | 0,175 | 0,0 | 0,0 | s |
| 9 | 0,757 | | | 0,4 | s |
| 10 | 0,684 | | | -0,8 | s |
| 14 | 0,978 | 0,24 | 2,1 | 4,1 | u |
| 15 | 0,756 | 0,113 | 0,5 | 0,4 | s |
| 16 | 0,689 | 0,12 | -0,7 | -0,7 | s |
| 17 | 0,68 | | | -0,9 | s |
| 18 | 0,586 | 0,147 | -1,9 | -2,6 | q |
| 19 | 0,71 | | | -0,4 | s |
| 20 | 0,744 | | | 0,2 | s |
| 21 | 0,671 | 0,268 | -0,4 | -1,0 | s |
| 22 | 0,624 | 0,019 | -9,1 | -1,9 | s |
| 23 | 0,749 | | | 0,3 | s |
| 25 | 0,646 | 0,129 | -1,3 | -1,5 | s |
| 26 | 0,657 | | | -1,3 | s |
| 29 | 0,702 | | | -0,5 | s |
| 31 | 0,728 | | | 0,0 | s |
| 32 | 0,71 | | | -0,4 | s |
| 33 | 0,76 | | | 0,5 | s |
| 35 | 0,667 | | | -1,1 | s |
| 36 | 0,675 | 0,044 | -2,4 | -1,0 | s |

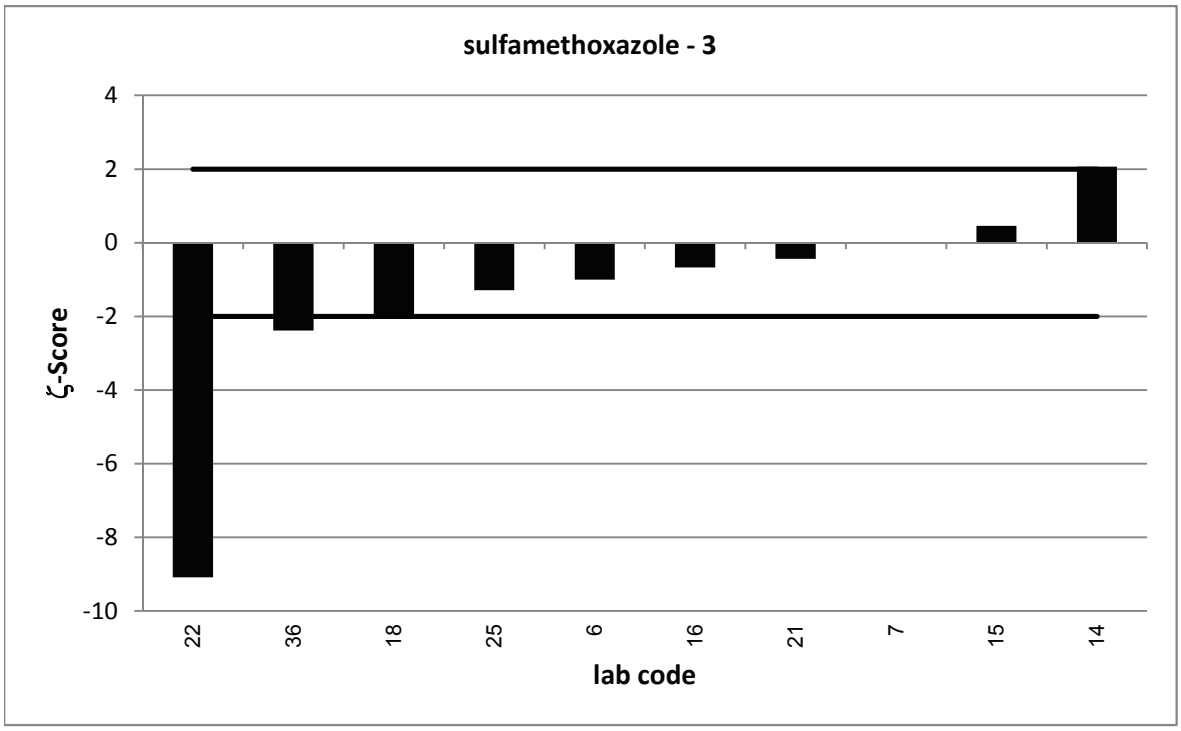
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfamethoxazole - 3
concentration in µg/l
1,2
1
0,8
0,6
0,4
0,2
0
3 18 22 25 5 26 35 21 36 17 10 16 6 2 29 19 32 31 7 20 23 15 9 33 14
lab code


sulfamethoxazole - 3
$z_U$-score
6
4
2
0
-2
-4
-6
-8
-10
-12
3 18 22 25 5 26 35 21 36 17 10 16 6 2 29 19 32 31 7 20 23 15 9 33 14
lab code

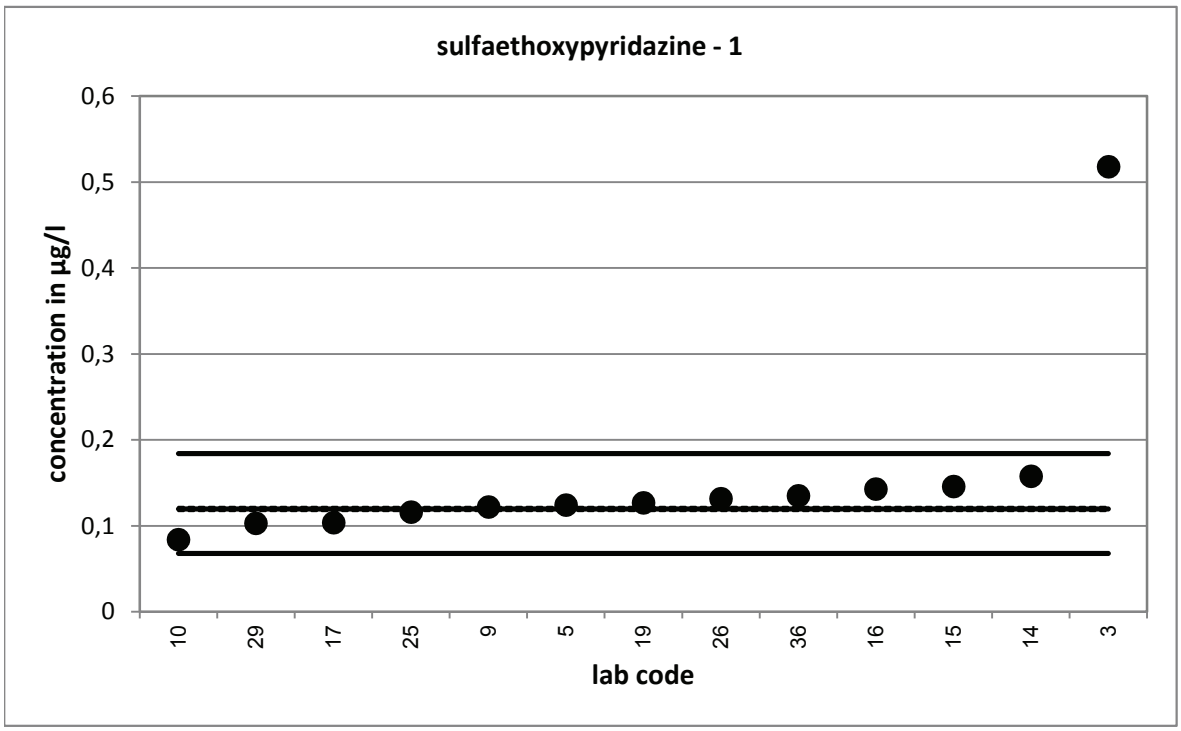

sulfamethoxazole - 3
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
22
36
6
15
16
25
18
7
14
21
lab code

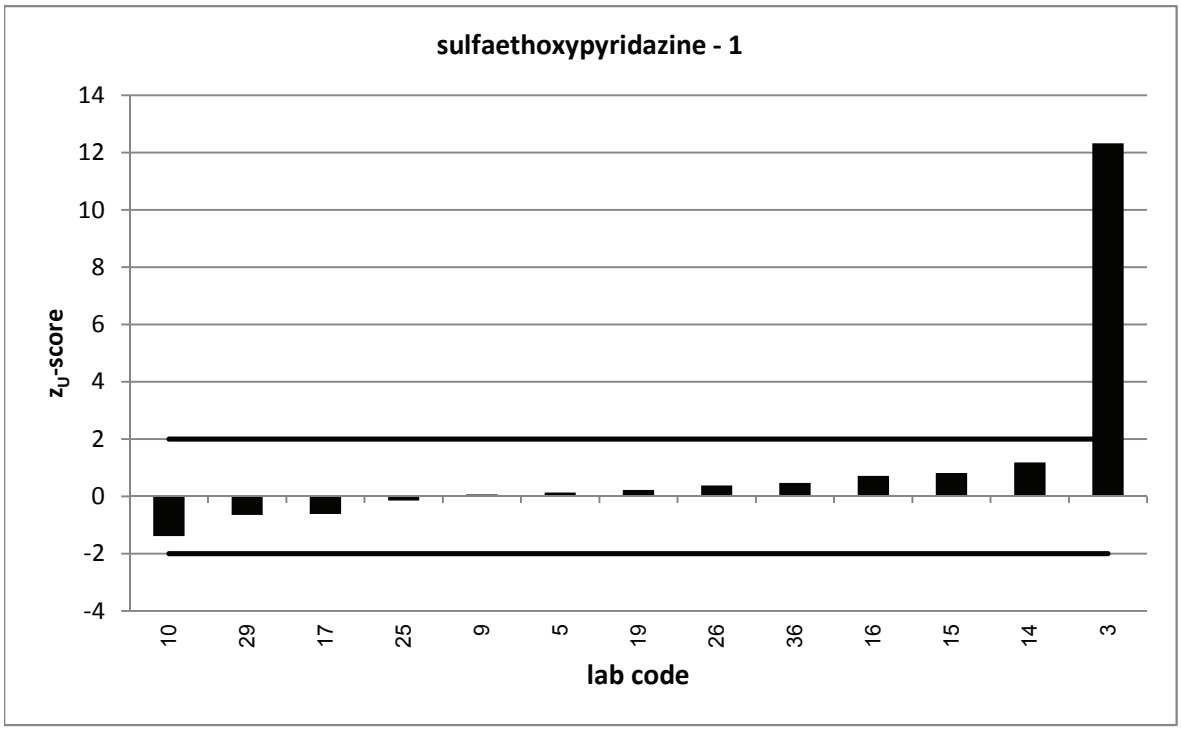

sulfamethoxazole - 3
ζ-Score
4
2
0
-2
-4
-6
-8
-10
22
36
18
25
6
16
21
7
15
14
lab code

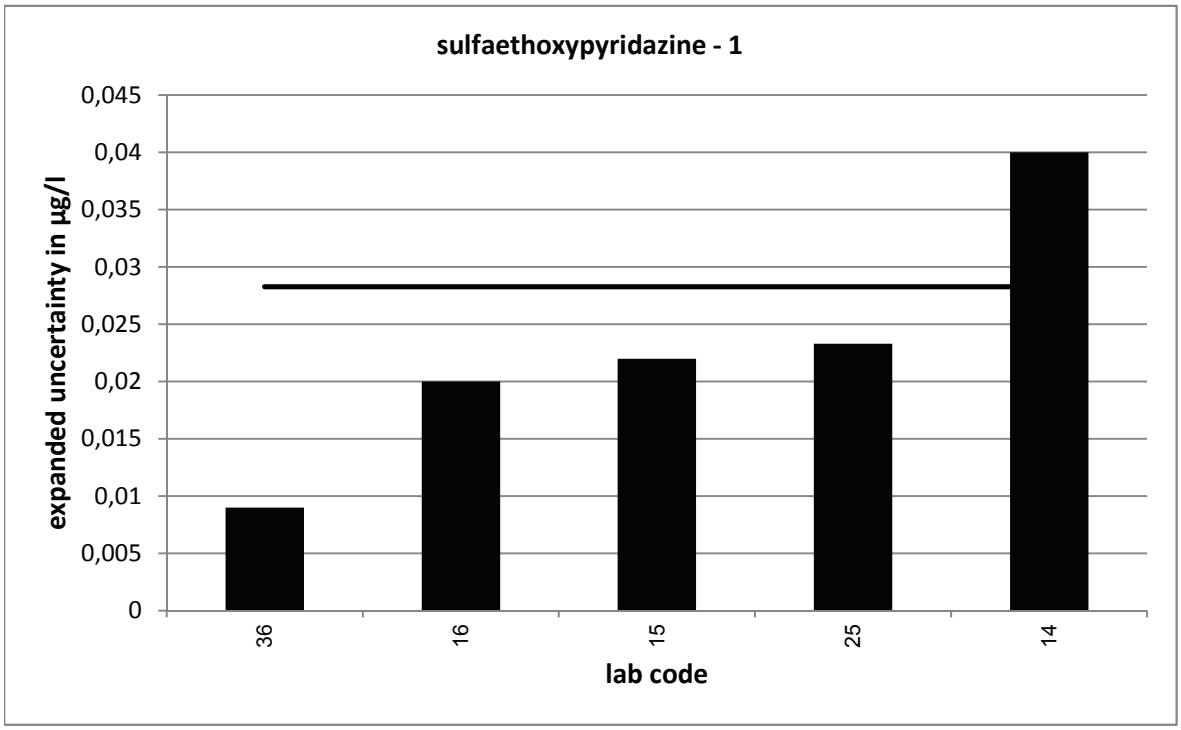
| PT 5/16 - TW S2 | | sulfaethoxypyridazine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | | 0,1196 | ± 0,0022 | |
| upper tolerance limit [µg/l] | | | 0,1843 | | |
| lower tolerance limit [µg/l] | | | 0,06813 | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,518 | | | 12,3 | u |
| 5 | 0,1242 | | | 0,1 | s |
| 9 | 0,122 | | | 0,1 | s |
| 10 | 0,084 | | | -1,4 | s |
| 14 | 0,158 | 0,04 | 1,9 | 1,2 | s |
| 15 | 0,146 | 0,022 | 2,4 | 0,8 | s |
| 16 | 0,143 | 0,02 | 2,3 | 0,7 | s |
| 17 | 0,104 | | | -0,6 | s |
| 19 | 0,127 | | | 0,2 | s |
| 25 | 0,116 | 0,023 | -0,3 | -0,1 | s |
| 26 | 0,132 | | | 0,4 | s |
| 29 | 0,103 | | | -0,6 | s |
| 36 | 0,135 | 0,009 | 3,3 | 0,5 | s |

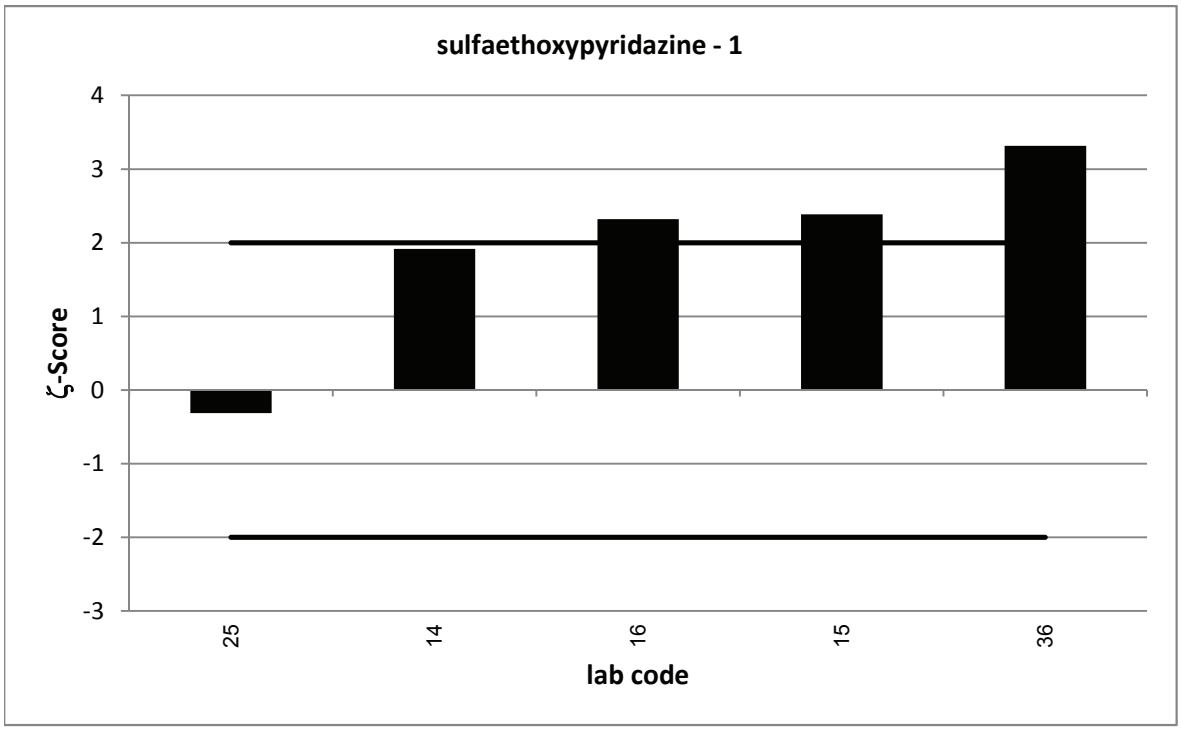
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfaethoxypyridazine - 1
concentration in µg/l
0,6
0,5
0,4
0,3
0,2
0,1
0
10
29
17
25
9
5
19
26
36
16
15
14
3
lab code


sulfaethoxypyridazine - 1
$z_U$-score
14
12
10
8
6
4
2
0
-2
-4
10
29
17
25
9
5
19
26
36
16
15
14
3
lab code

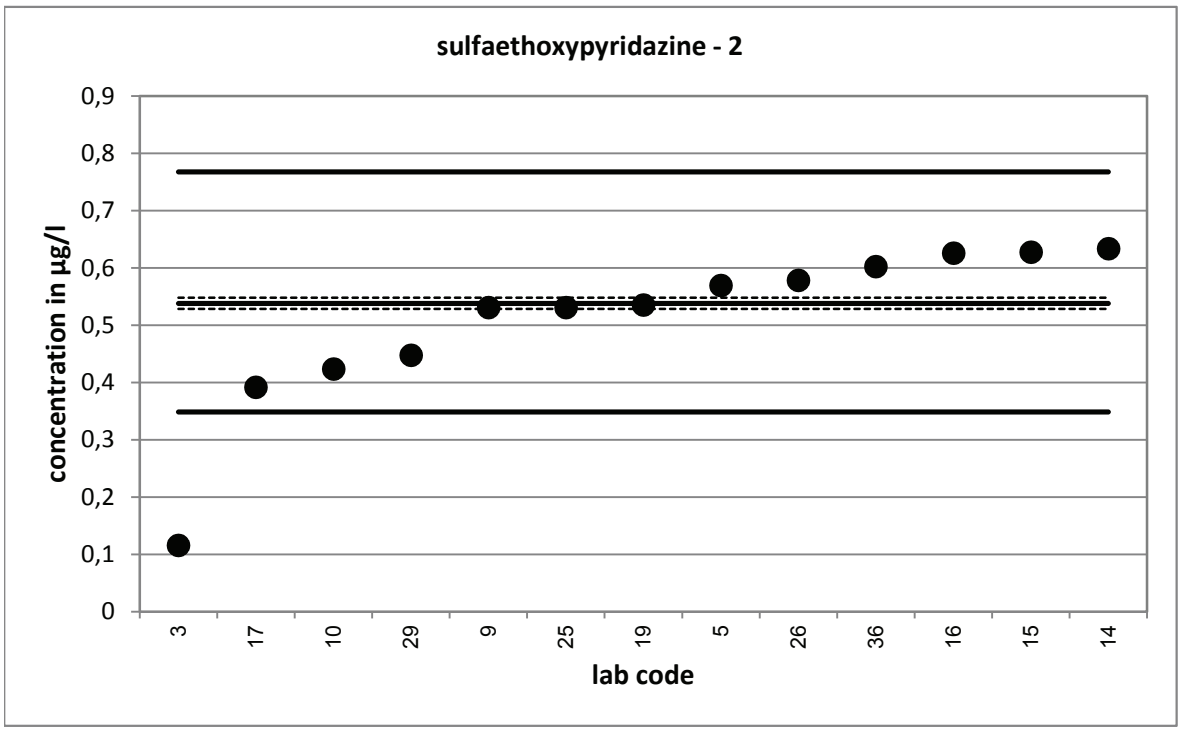

sulfaethoxypyridazine - 1
expanded uncertainty in µg/l
0,045
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
36
16
15
25
14
lab code

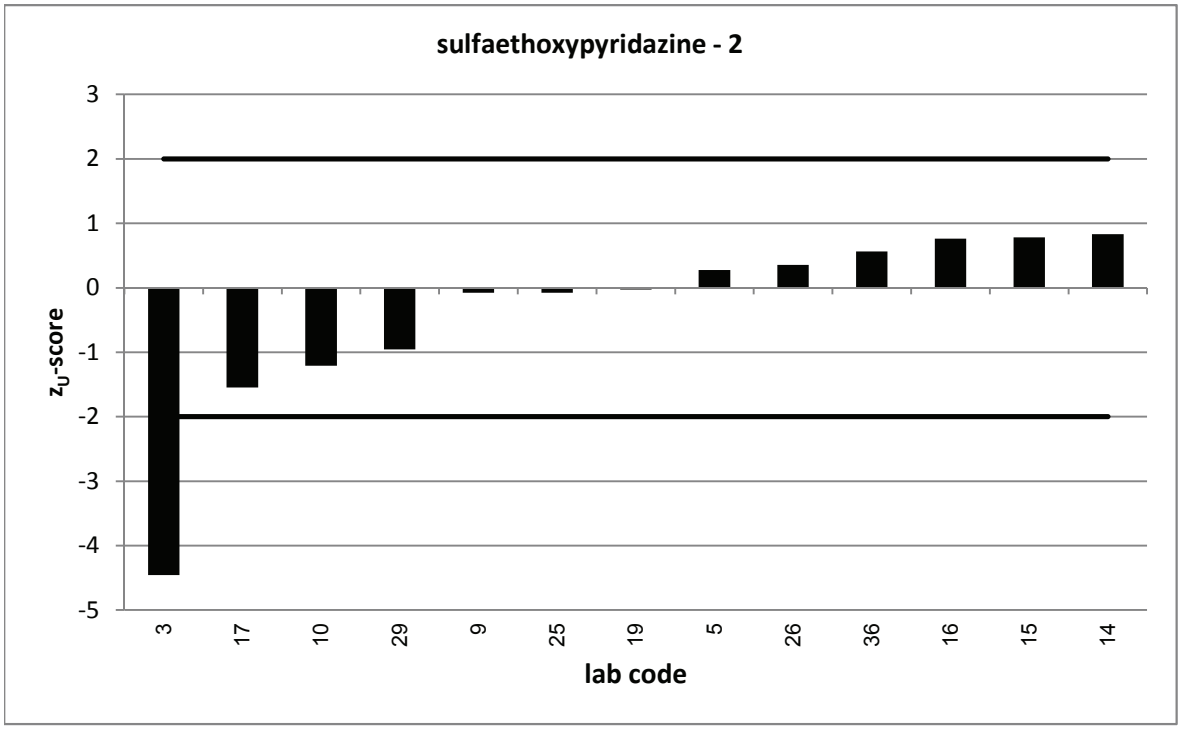

sulfaethoxypyridazine - 1
ζ-Score
4
3
2
1
0
-1
-2
-3
25
14
16
15
36
lab code

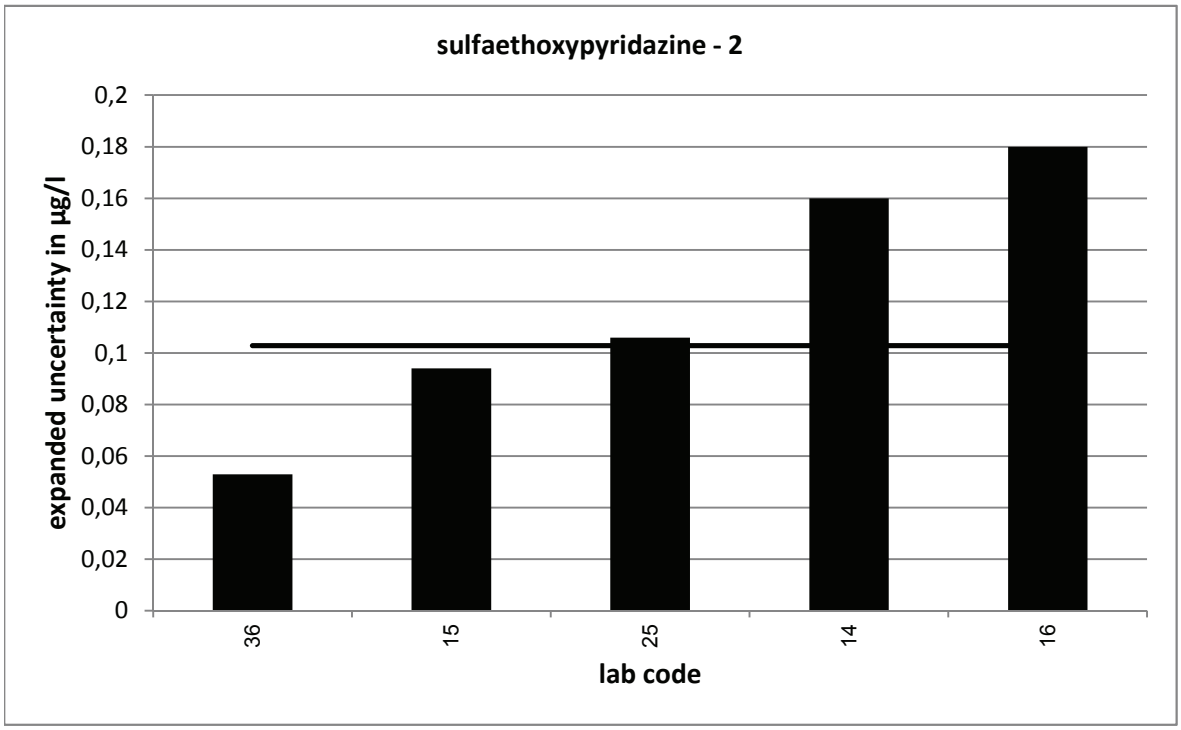
| PT 5/16 - TW S2 | | sulfaethoxypyridazine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,5384 | ± 0,0099 | | |
| upper tolerance limit [µg/l] | | 0,7676 | | | |
| lower tolerance limit [µg/l] | | 0,3489 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,116 | | | -4,5 | u |
| 5 | 0,57 | | | 0,3 | s |
| 9 | 0,531 | | | -0,1 | s |
| 10 | 0,424 | | | -1,2 | s |
| 14 | 0,634 | 0,16 | 1,2 | 0,8 | s |
| 15 | 0,628 | 0,094 | 1,9 | 0,8 | s |
| 16 | 0,626 | 0,18 | 1,0 | 0,8 | s |
| 17 | 0,392 | | | -1,5 | s |
| 19 | 0,536 | | | 0,0 | s |
| 25 | 0,531 | 0,106 | -0,1 | -0,1 | s |
| 26 | 0,579 | | | 0,4 | s |
| 29 | 0,448 | | | -1,0 | s |
| 36 | 0,603 | 0,053 | 2,4 | 0,6 | s |

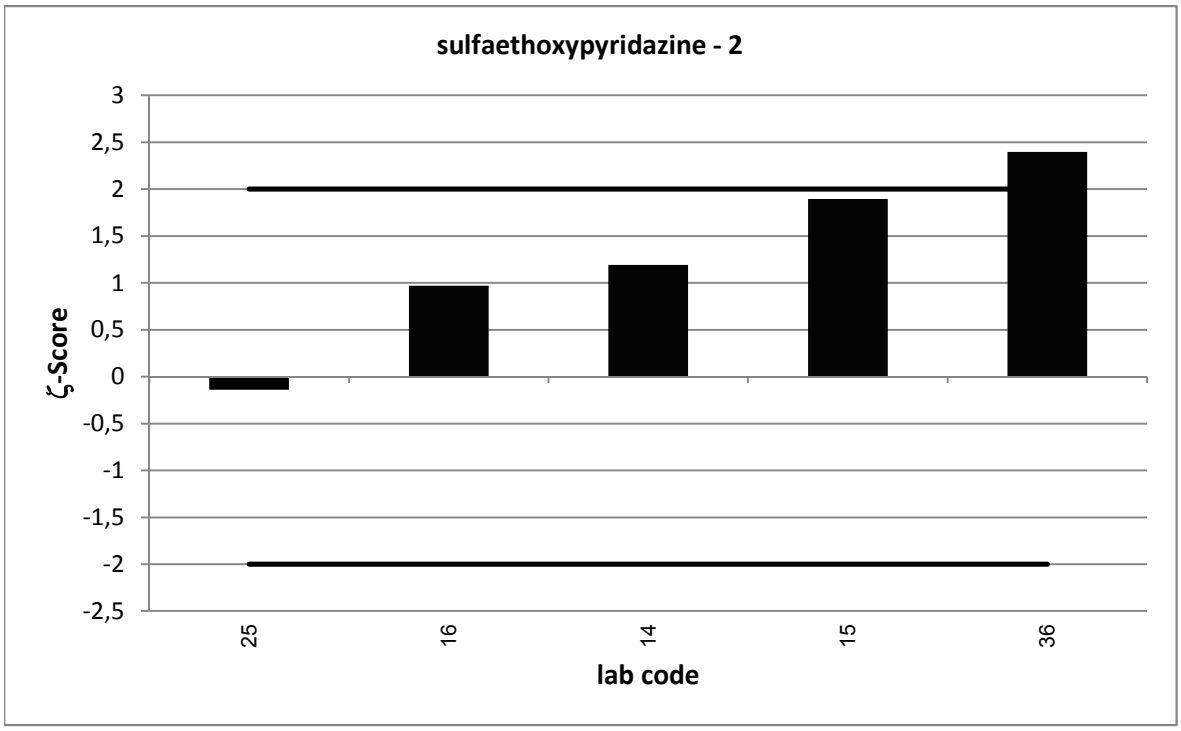
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfaethoxypyridazine - 2
concentration in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
17
10
29
9
25
19
5
26
36
16
15
14
lab code


sulfaethoxypyridazine - 2
$z_U$-score
3
2
1
0
-1
-2
-3
-4
-5
3
17
10
29
9
25
19
5
26
36
16
15
14
lab code

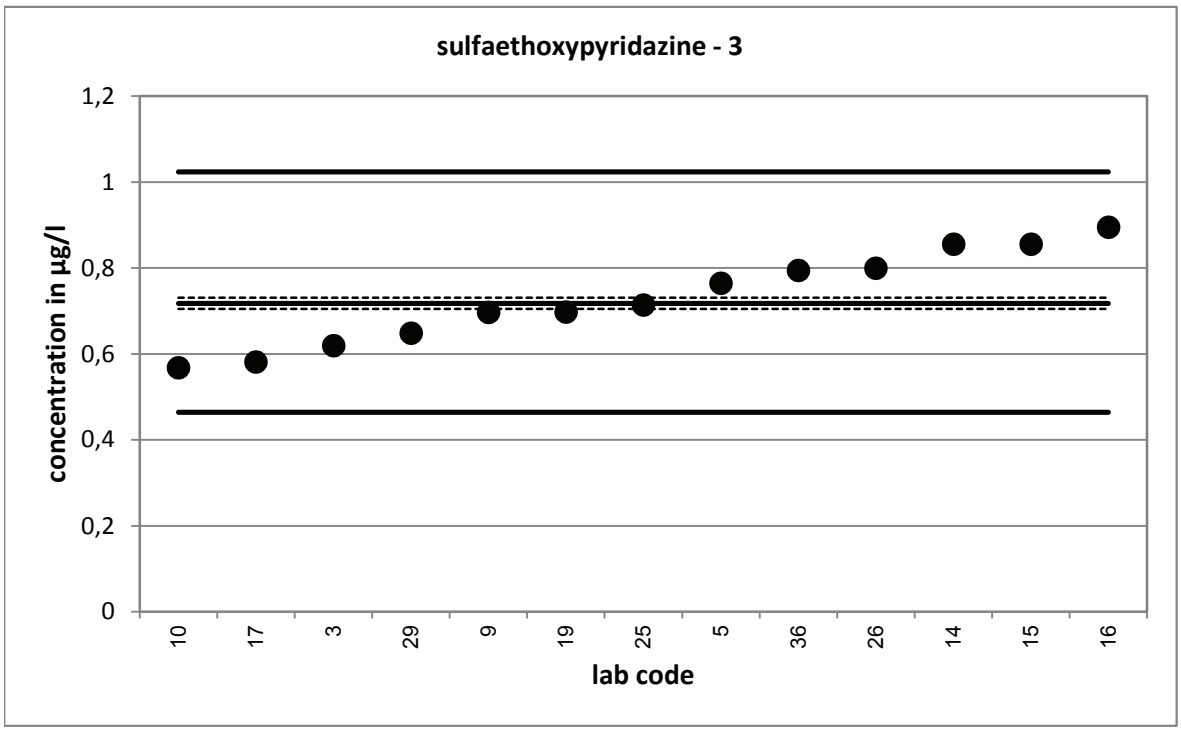

sulfaethoxypyridazine - 2
expanded uncertainty in µg/l
0,2
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36
15
25
14
16
lab code

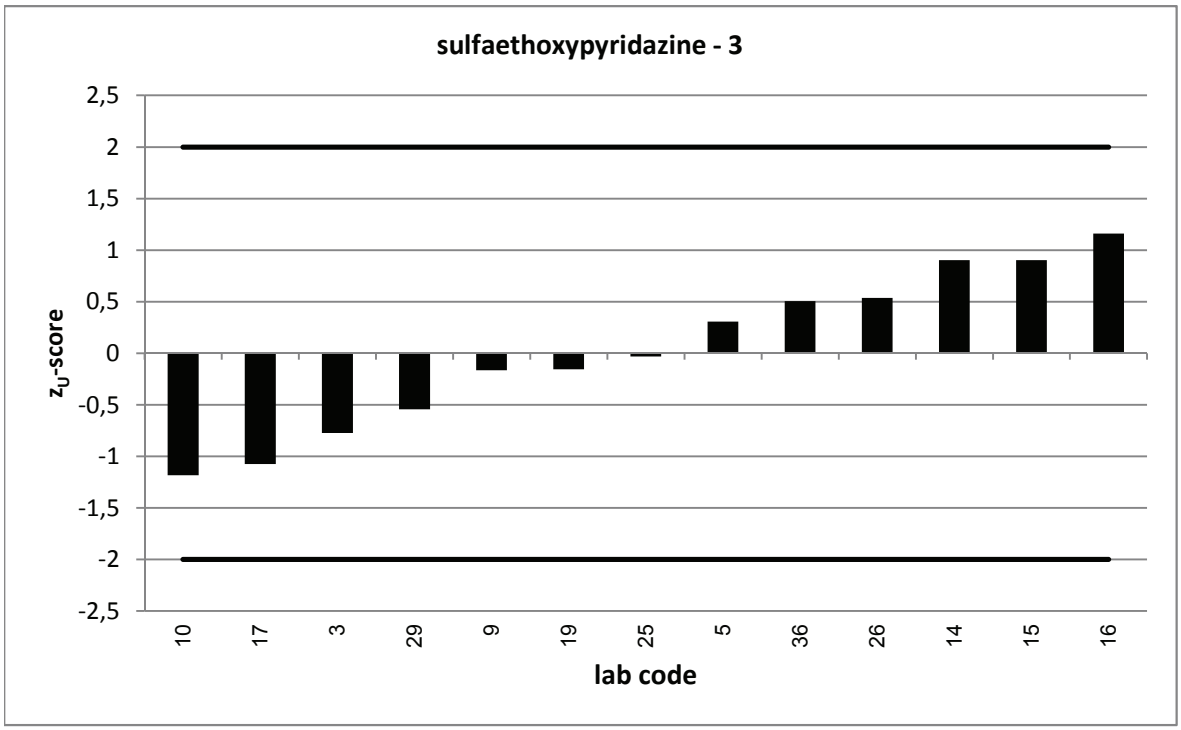

sulfaethoxypyridazine - 2
ζ-Score
3
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
16
14
15
36
lab code

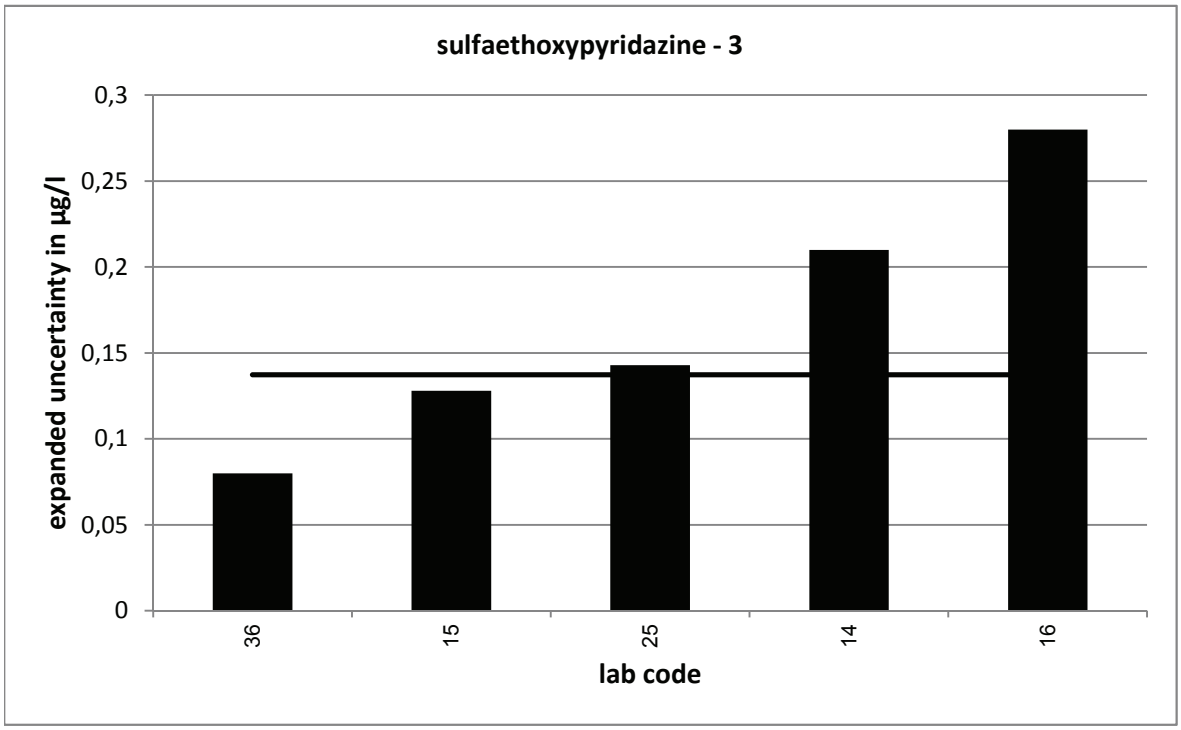
| PT 5/16 - TW S2 | | sulfaethoxypyridazine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,7179 | ± 0,0131 | | |
| upper tolerance limit [µg/l] | | 1,023 | | | |
| lower tolerance limit [µg/l] | | 0,4645 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,62 | | | -0,8 | s |
| 5 | 0,7647 | | | 0,3 | s |
| 9 | 0,697 | | | -0,2 | s |
| 10 | 0,568 | | | -1,2 | s |
| 14 | 0,856 | 0,21 | 1,3 | 0,9 | s |
| 15 | 0,856 | 0,128 | 2,1 | 0,9 | s |
| 16 | 0,895 | 0,28 | 1,3 | 1,2 | s |
| 17 | 0,582 | | | -1,1 | s |
| 19 | 0,698 | | | -0,2 | s |
| 25 | 0,714 | 0,143 | -0,1 | 0,0 | s |
| 26 | 0,8 | | | 0,5 | s |
| 29 | 0,649 | | | -0,5 | s |
| 36 | 0,795 | 0,08 | 1,9 | 0,5 | s |

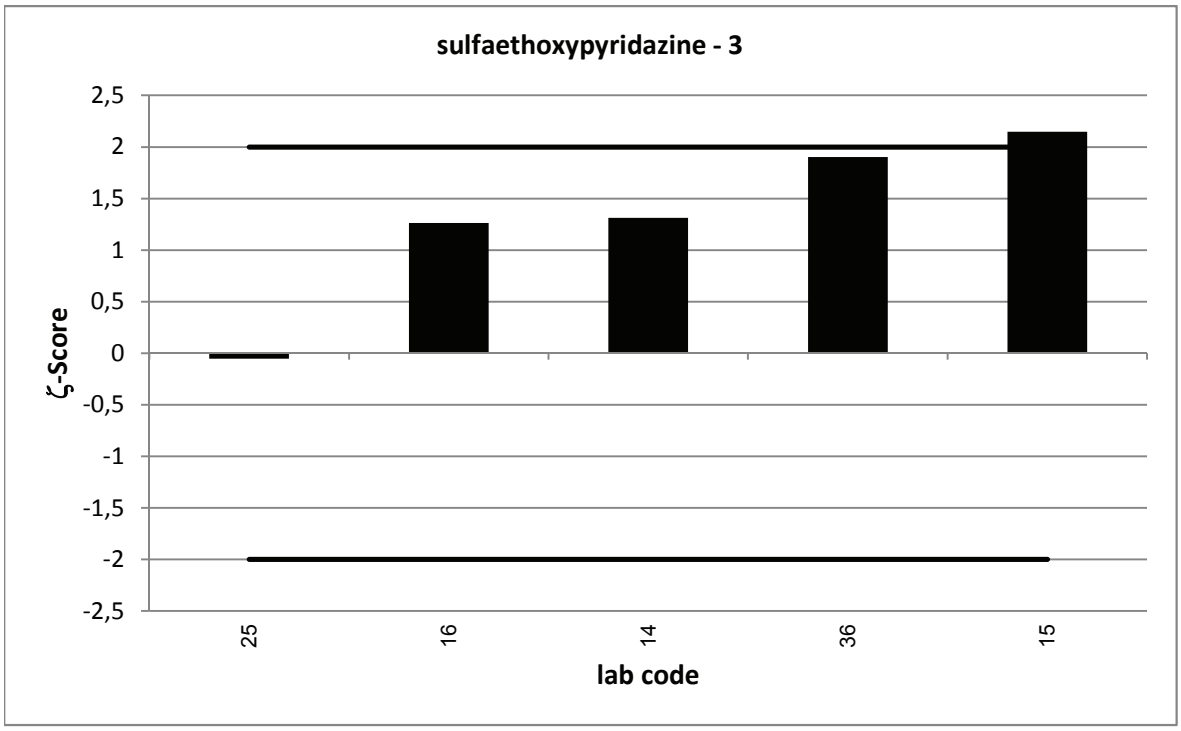
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfaethoxypyridazine - 3
concentration in µg/l
1,2
1
0,8
0,6
0,4
0,2
0
10
17
3
29
9
19
25
5
36
26
14
15
16
lab code

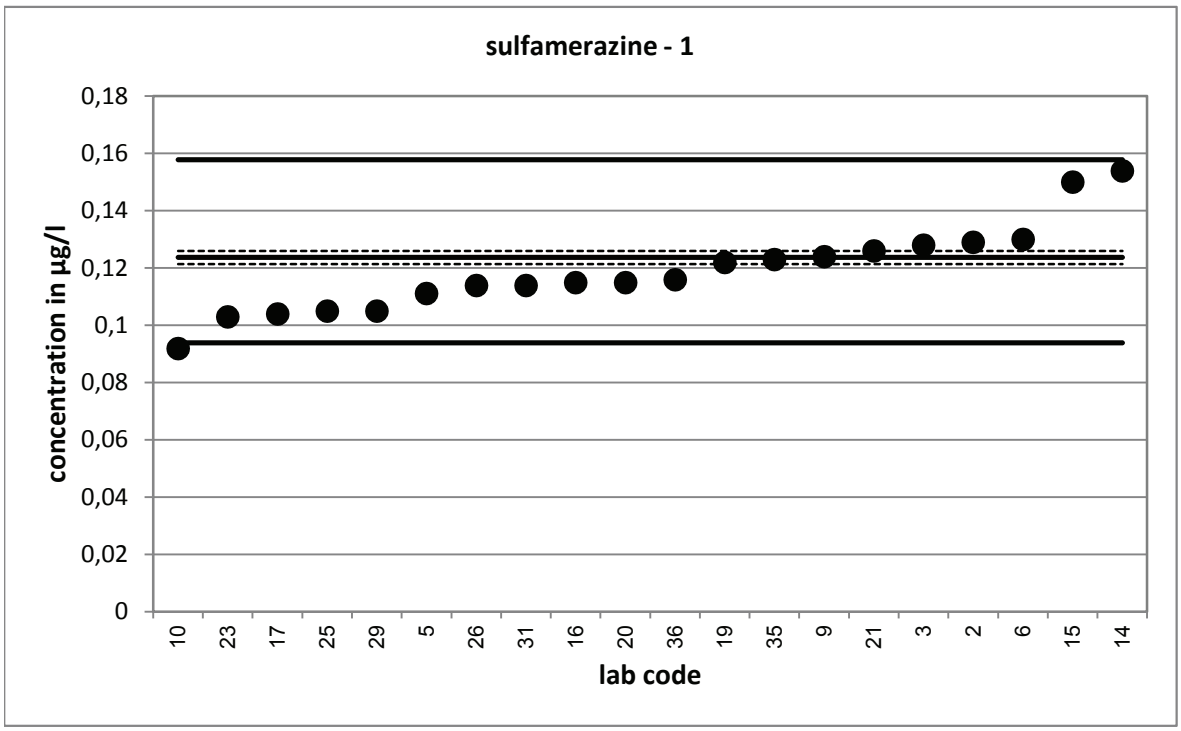

sulfaethoxypyridazine - 3
$z_U$-score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
10
17
3
29
9
19
25
5
36
26
14
15
16
lab code

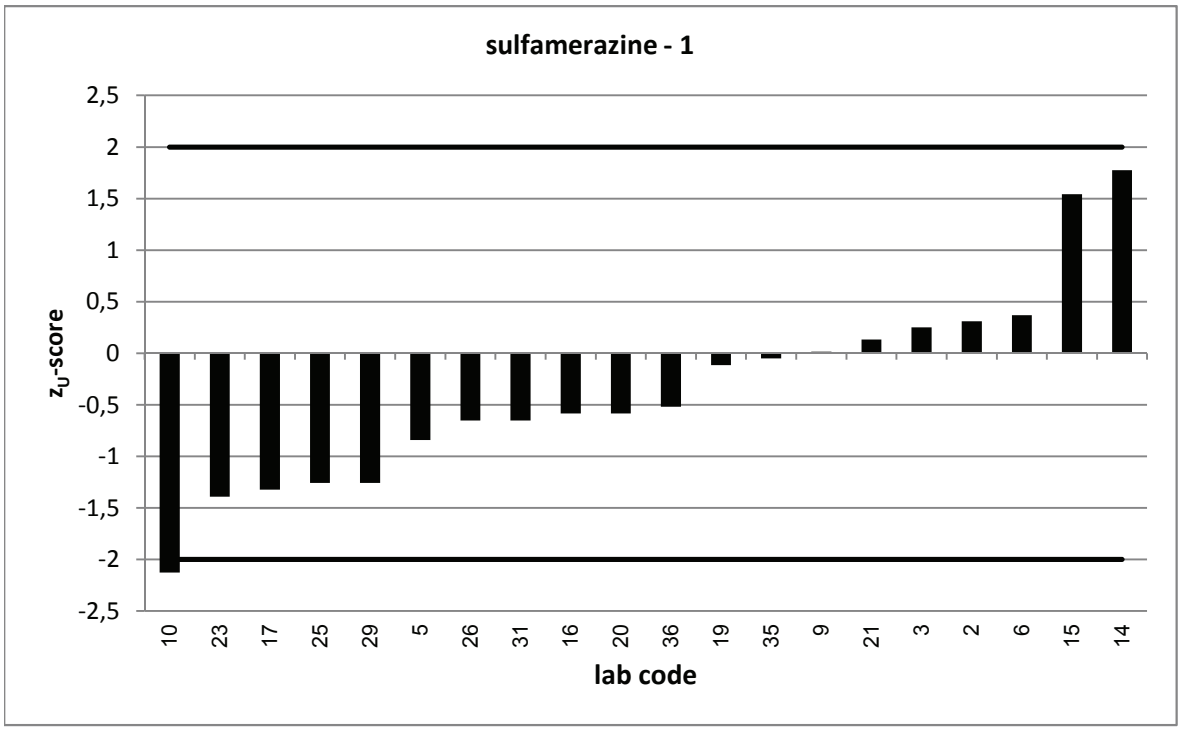

sulfaethoxypyridazine - 3
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
36
15
25
14
16
lab code

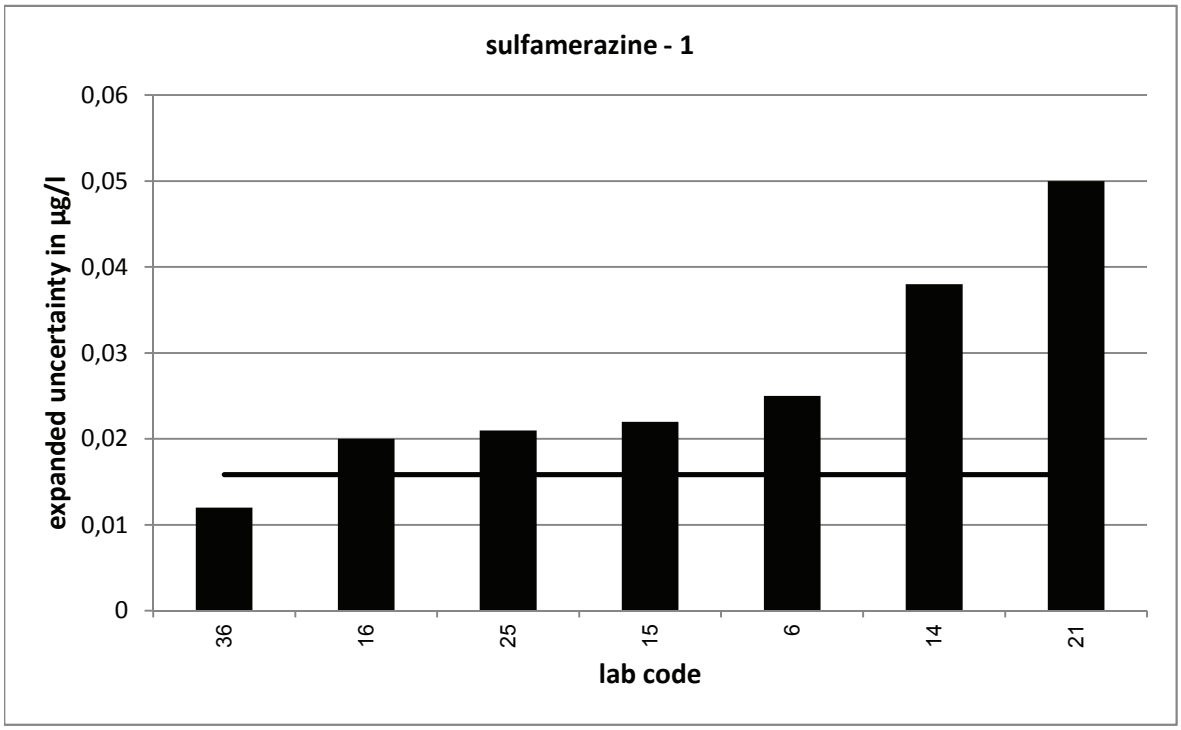

sulfaethoxypyridazine - 3
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
16
14
36
15
lab code

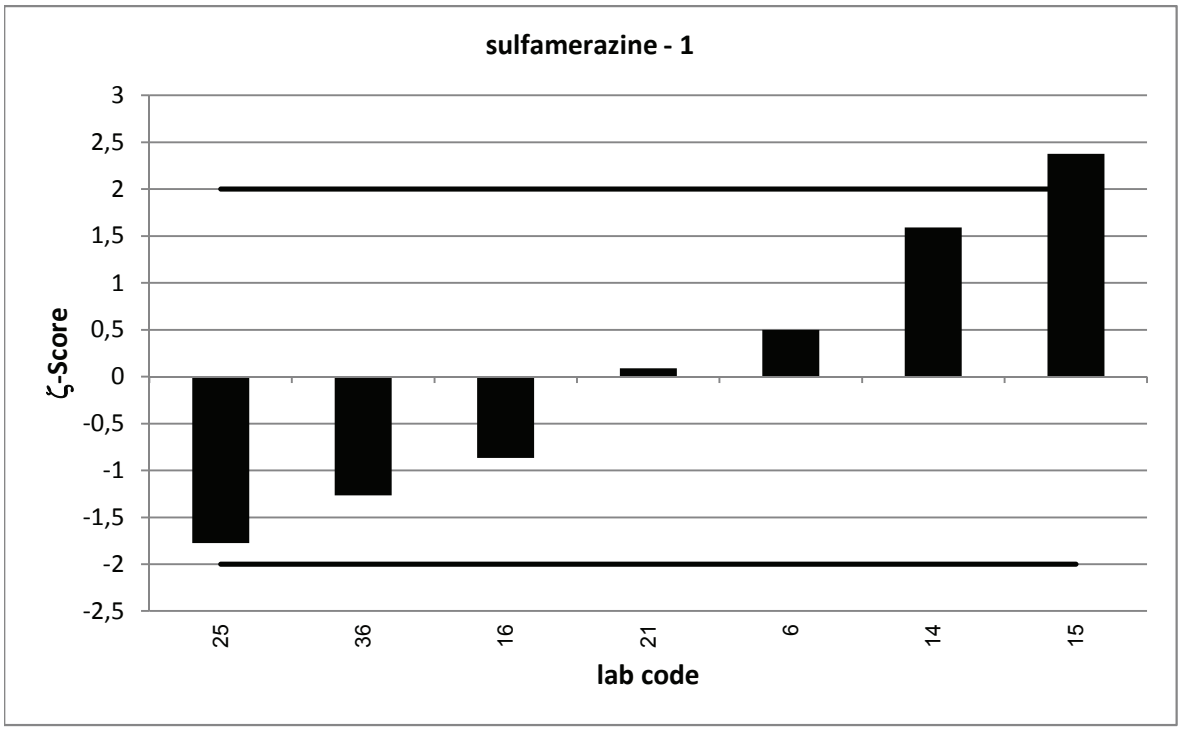
| PT 5/16 - TW S2 | | sulfamerazine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1237 | ± 0,0023 | | |
| upper tolerance limit [µg/l] | | 0,1578 | | | |
| lower tolerance limit [µg/l] | | 0,0939 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,129 | | | 0,3 | s |
| 3 | 0,128 | | | 0,3 | s |
| 5 | 0,1112 | | | -0,8 | s |
| 6 | 0,13 | 0,025 | 0,5 | 0,4 | s |
| 9 | 0,124 | | | 0,0 | s |
| 10 | 0,092 | | | -2,1 | q |
| 14 | 0,154 | 0,038 | 1,6 | 1,8 | s |
| 15 | 0,15 | 0,022 | 2,4 | 1,5 | s |
| 16 | 0,115 | 0,02 | -0,9 | -0,6 | s |
| 17 | 0,104 | | | -1,3 | s |
| 19 | 0,122 | | | -0,1 | s |
| 20 | 0,115 | | | -0,6 | s |
| 21 | 0,126 | 0,05 | 0,1 | 0,1 | s |
| 23 | 0,103 | | | -1,4 | s |
| 25 | 0,105 | 0,021 | -1,8 | -1,3 | s |
| 26 | 0,114 | | | -0,7 | s |
| 29 | 0,105 | | | -1,3 | s |
| 31 | 0,114 | | | -0,7 | s |
| 35 | 0,123 | | | 0,0 | s |
| 36 | 0,116 | 0,012 | -1,3 | -0,5 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfamerazine - 1
concentration in µg/l
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
10 23 17 25 29 5 26 31 16 20 36 19 35 9 21 3 2 6 15 14
lab code

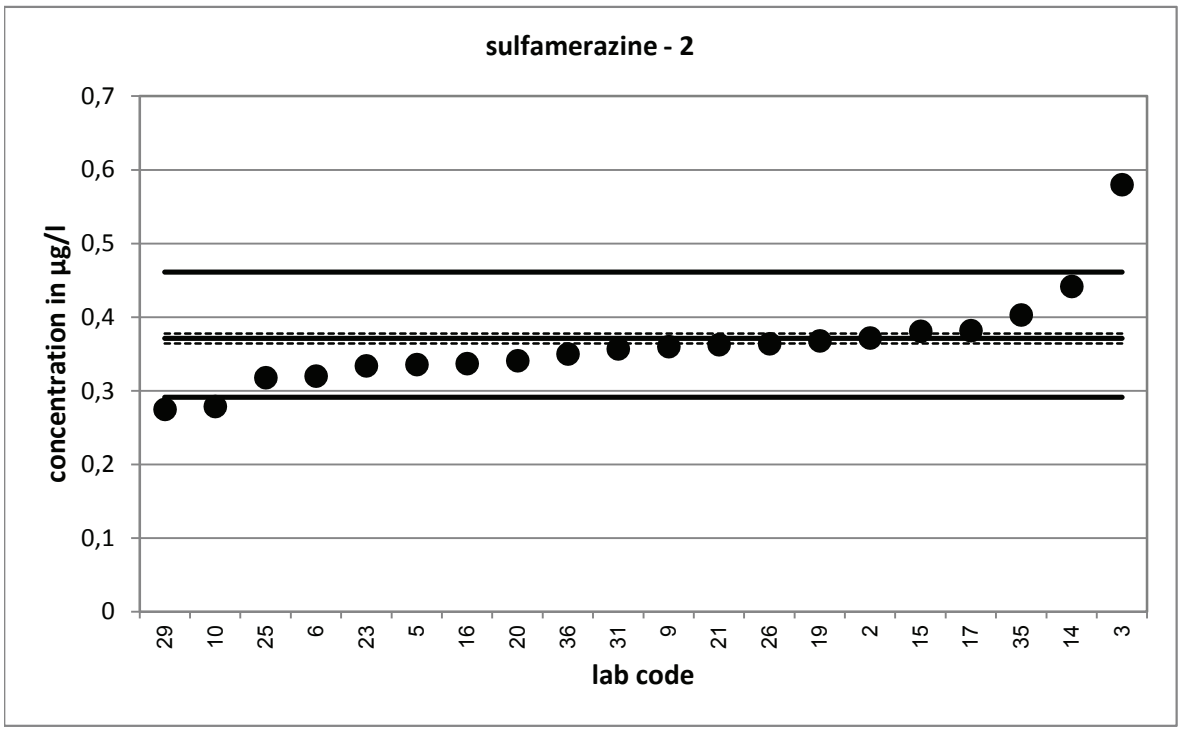

sulfamerazine - 1
$z_U$-score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
10 23 17 25 29 5 26 31 16 20 36 19 35 9 21 3 2 6 15 14
lab code

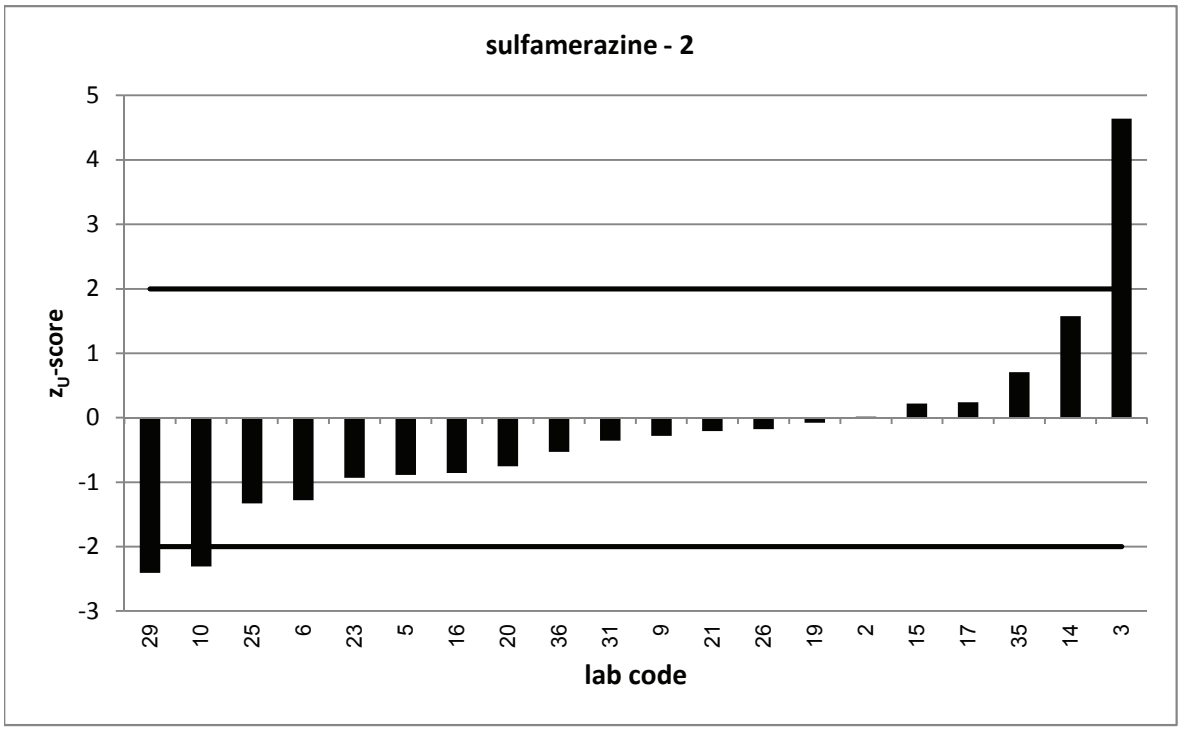

sulfamerazine - 1
expanded uncertainty in µg/l
0,06
0,05
0,04
0,03
0,02
0,01
0
36
16
25
15
6
14
21
lab code

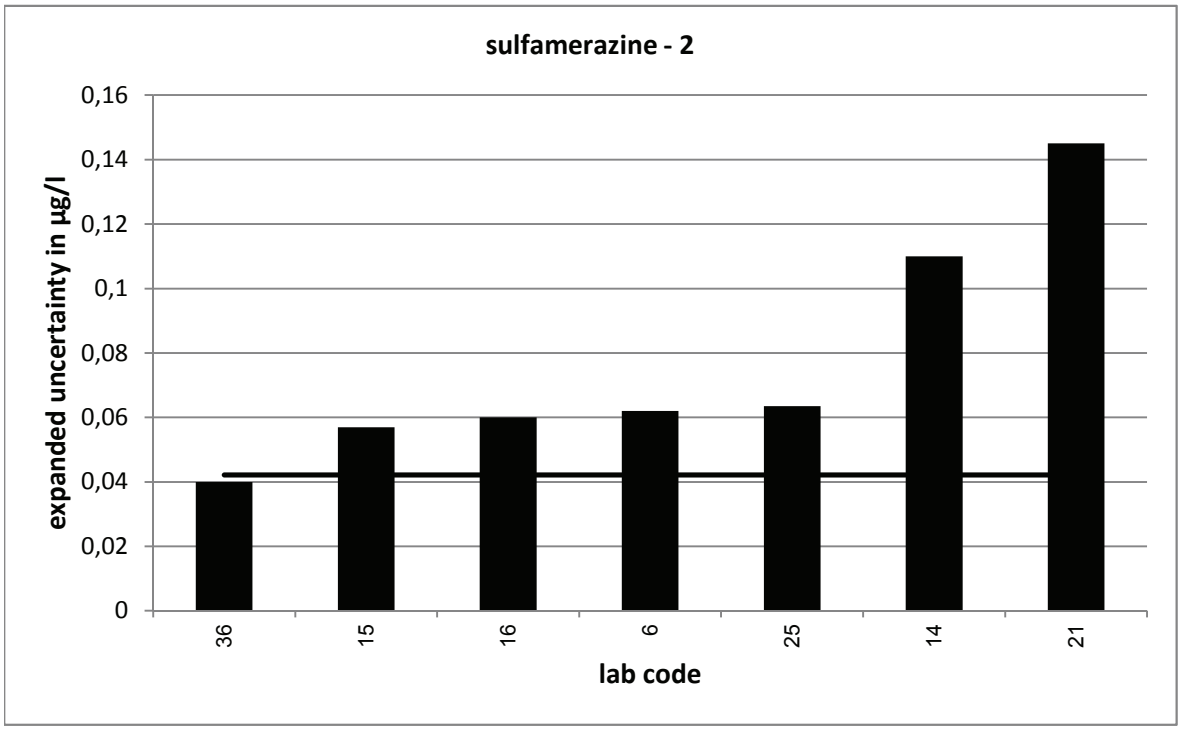

sulfamerazine - 1
ζ-Score
3
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
36
16
21
6
14
15
lab code

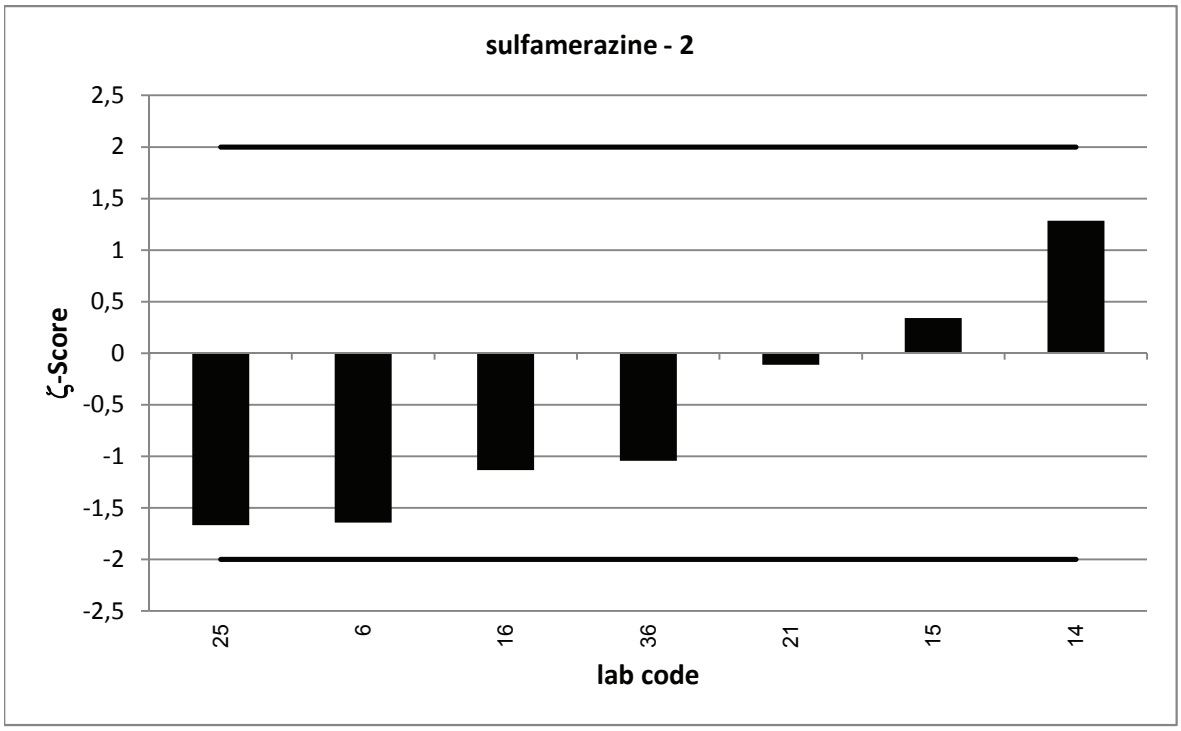
| PT 5/16 - TW S2 | | sulfamerazine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,3712 | ± 0,0068 | | |
| upper tolerance limit [µg/l] | | 0,4612 | | | |
| lower tolerance limit [µg/l] | | 0,2913 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,372 | | | 0,0 | s |
| 3 | 0,58 | | | 4,6 | u |
| 5 | 0,3358 | | | -0,9 | s |
| 6 | 0,32 | 0,062 | -1,6 | -1,3 | s |
| 9 | 0,36 | | | -0,3 | s |
| 10 | 0,279 | | | -2,3 | q |
| 14 | 0,442 | 0,11 | 1,3 | 1,6 | s |
| 15 | 0,381 | 0,057 | 0,3 | 0,2 | s |
| 16 | 0,337 | 0,06 | -1,1 | -0,9 | s |
| 17 | 0,382 | | | 0,2 | s |
| 19 | 0,368 | | | -0,1 | s |
| 20 | 0,341 | | | -0,8 | s |
| 21 | 0,363 | 0,145 | -0,1 | -0,2 | s |
| 23 | 0,334 | | | -0,9 | s |
| 25 | 0,318 | 0,064 | -1,7 | -1,3 | s |
| 26 | 0,364 | | | -0,2 | s |
| 29 | 0,275 | | | -2,4 | q |
| 31 | 0,357 | | | -0,4 | s |
| 35 | 0,403 | | | 0,7 | s |
| 36 | 0,35 | 0,04 | -1,0 | -0,5 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfamerazine - 2
concentration in µg/l
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
29 10 25 6 23 5 16 20 36 31 9 21 26 19 2 15 17 35 14 3
lab code

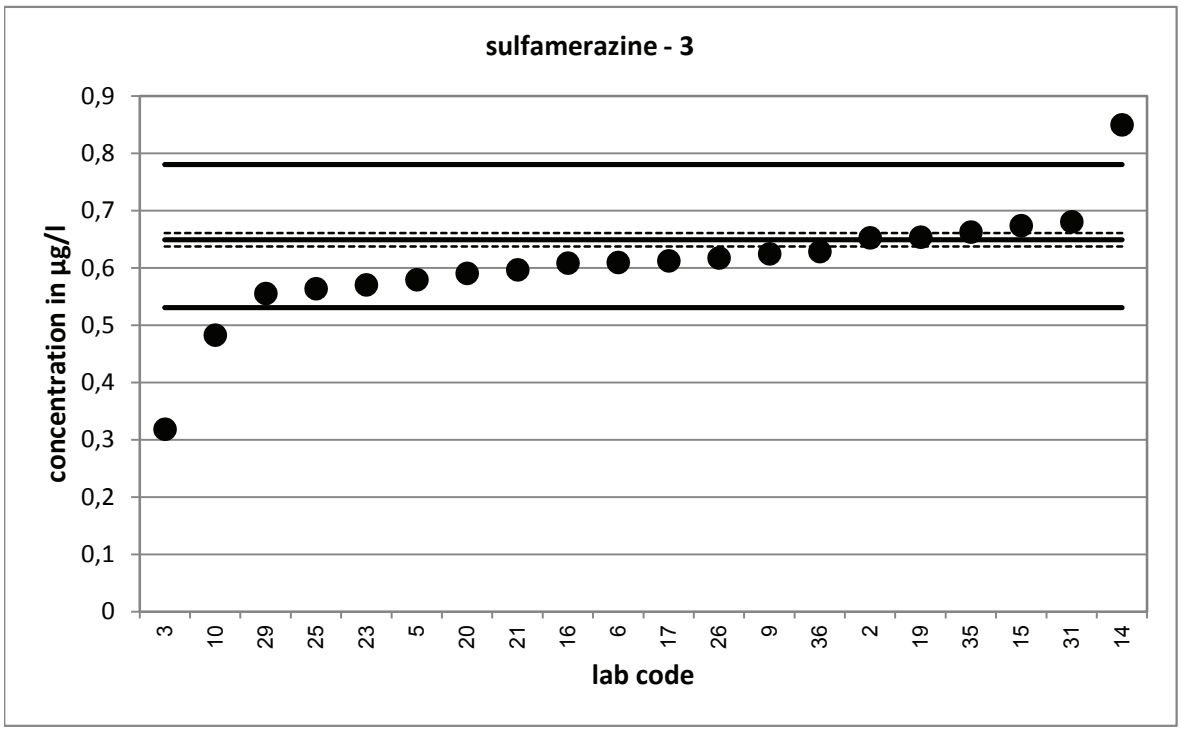

sulfamerazine - 2
$z_U$-score
5
4
3
2
1
0
-1
-2
-3
29 10 25 6 23 5 16 20 36 31 9 21 26 19 2 15 17 35 14 3
lab code

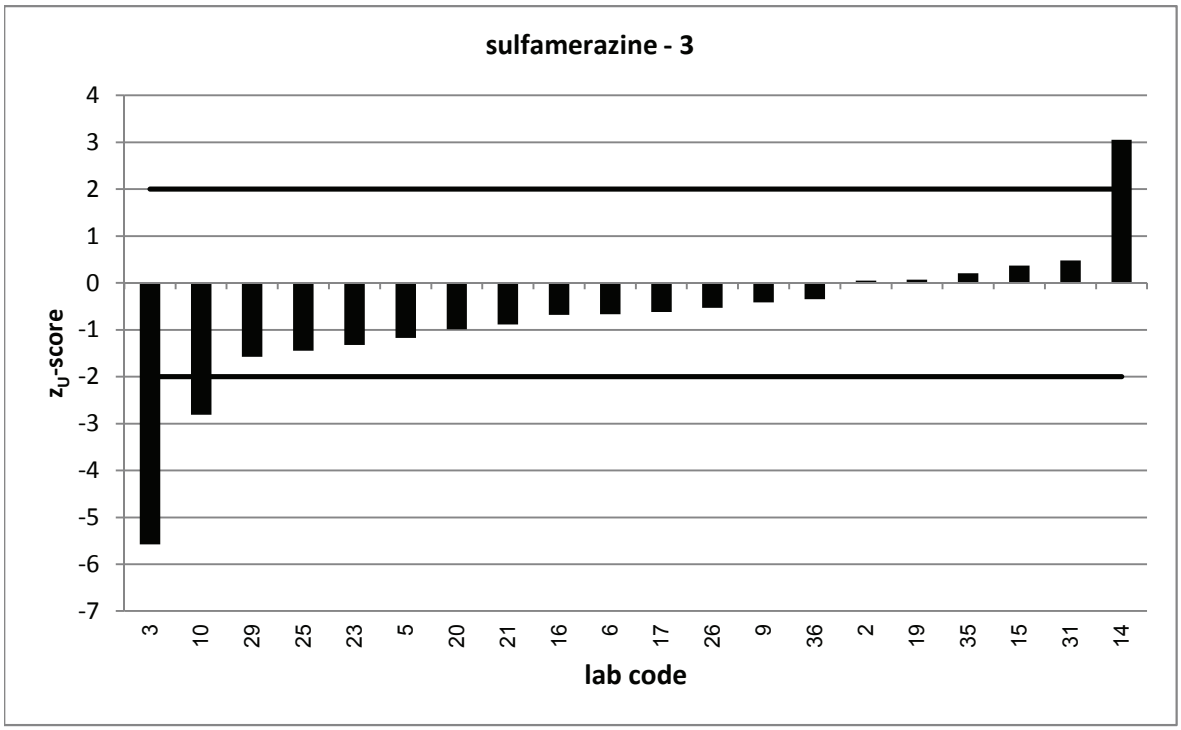

sulfamerazine - 2
expanded uncertainty in µg/l
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36
15
16
6
25
14
21
lab code

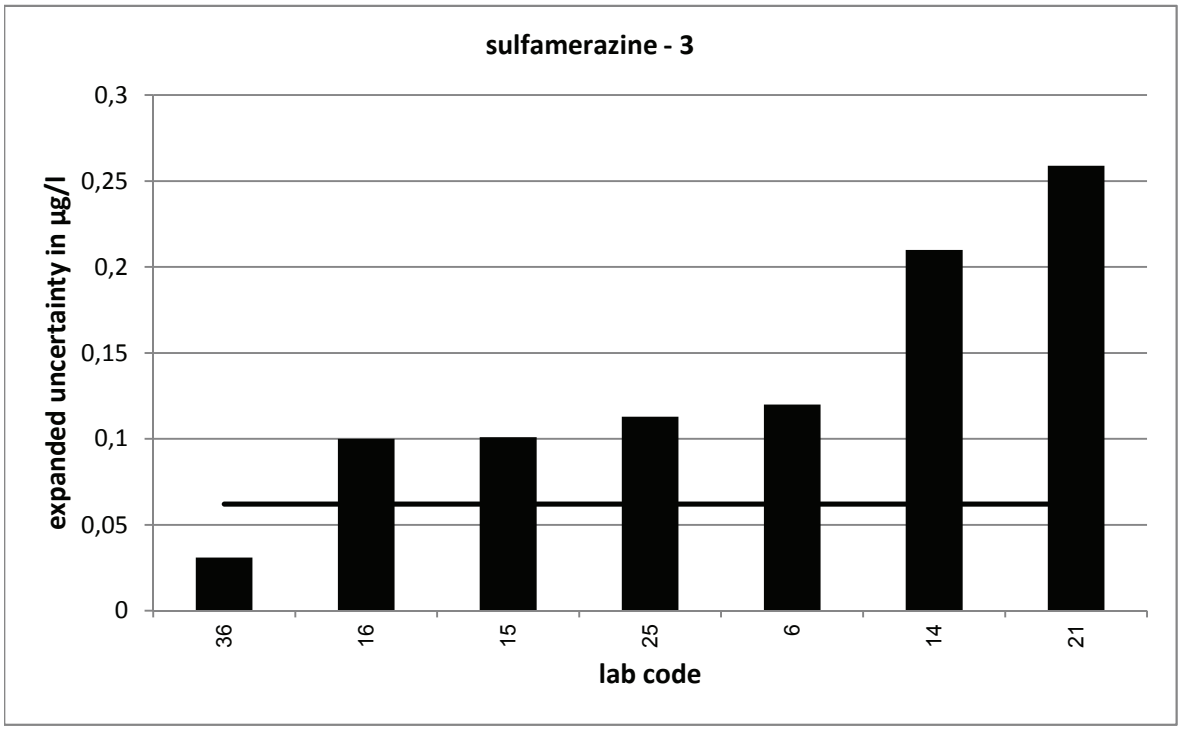

sulfamerazine - 2
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
6
16
36
21
15
14
lab code

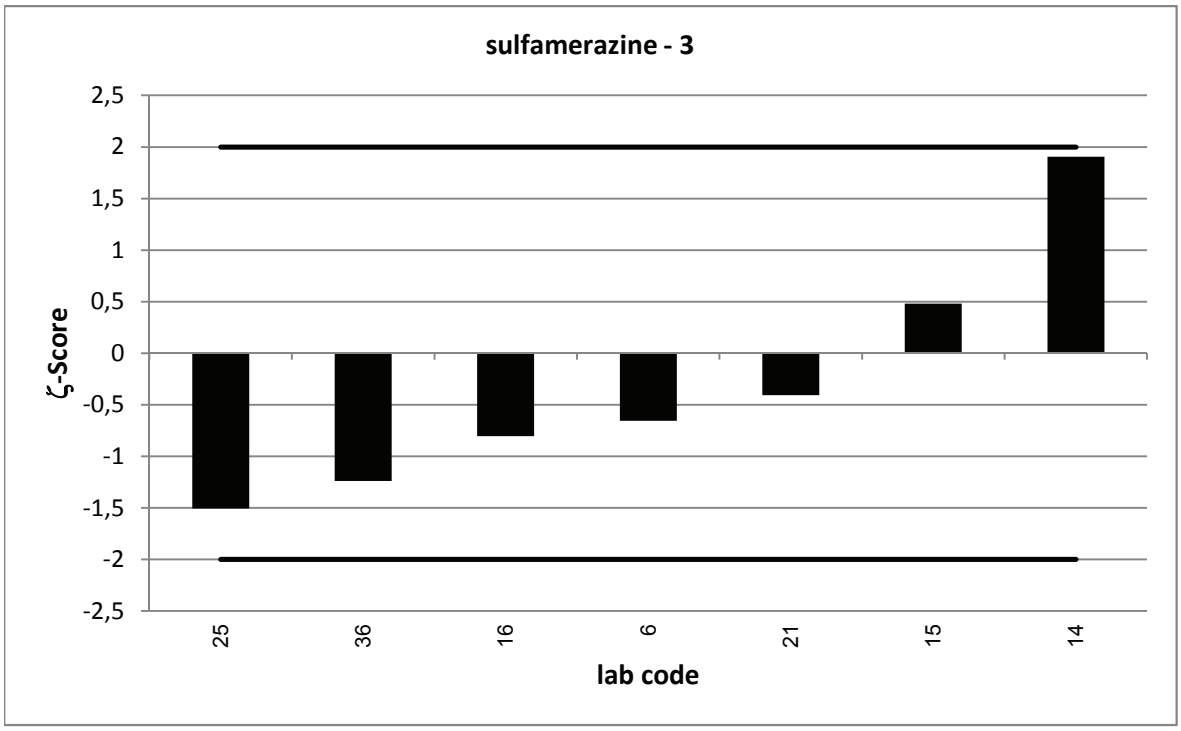
| PT 5/16 - TW S2 | | sulfamerazine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,6496 | ± 0,0118 | | |
| upper tolerance limit [µg/l] | | 0,7808 | | | |
| lower tolerance limit [µg/l] | | 0,5309 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,653 | | | 0,1 | s |
| 3 | 0,319 | | | -5,6 | u |
| 5 | 0,5799 | | | -1,2 | s |
| 6 | 0,61 | 0,12 | -0,7 | -0,7 | s |
| 9 | 0,625 | | | -0,4 | s |
| 10 | 0,483 | | | -2,8 | q |
| 14 | 0,85 | 0,21 | 1,9 | 3,1 | u |
| 15 | 0,674 | 0,101 | 0,5 | 0,4 | s |
| 16 | 0,609 | 0,1 | -0,8 | -0,7 | s |
| 17 | 0,613 | | | -0,6 | s |
| 19 | 0,654 | | | 0,1 | s |
| 20 | 0,591 | | | -1,0 | s |
| 21 | 0,597 | 0,259 | -0,4 | -0,9 | s |
| 23 | 0,571 | | | -1,3 | s |
| 25 | 0,564 | 0,113 | -1,5 | -1,4 | s |
| 26 | 0,618 | | | -0,5 | s |
| 29 | 0,556 | | | -1,6 | s |
| 31 | 0,681 | | | 0,5 | s |
| 35 | 0,663 | | | 0,2 | s |
| 36 | 0,629 | 0,031 | -1,2 | -0,3 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfamerazine - 3
concentration in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3 10 29 25 23 5 20 21 16 6 17 26 9 36 2 19 35 15 31 14
lab code

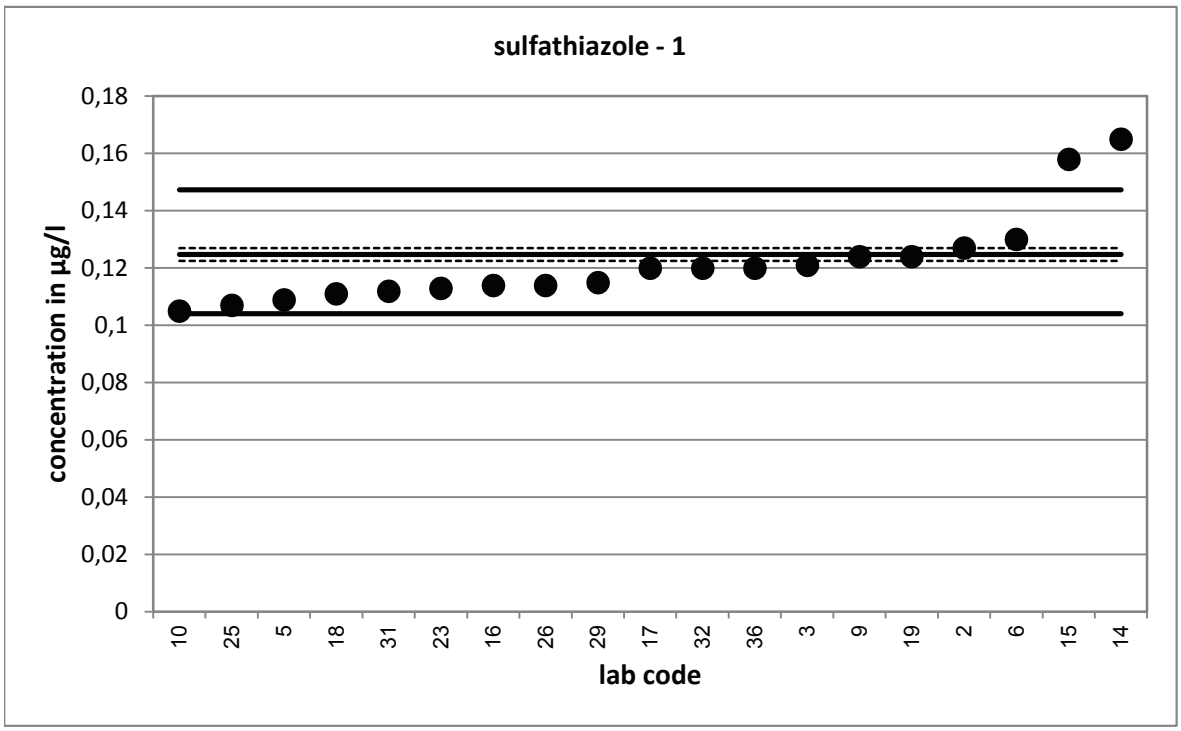

sulfamerazine - 3
$z_U$-score
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
3 10 29 25 23 5 20 21 16 6 17 26 9 36 2 19 35 15 31 14
lab code

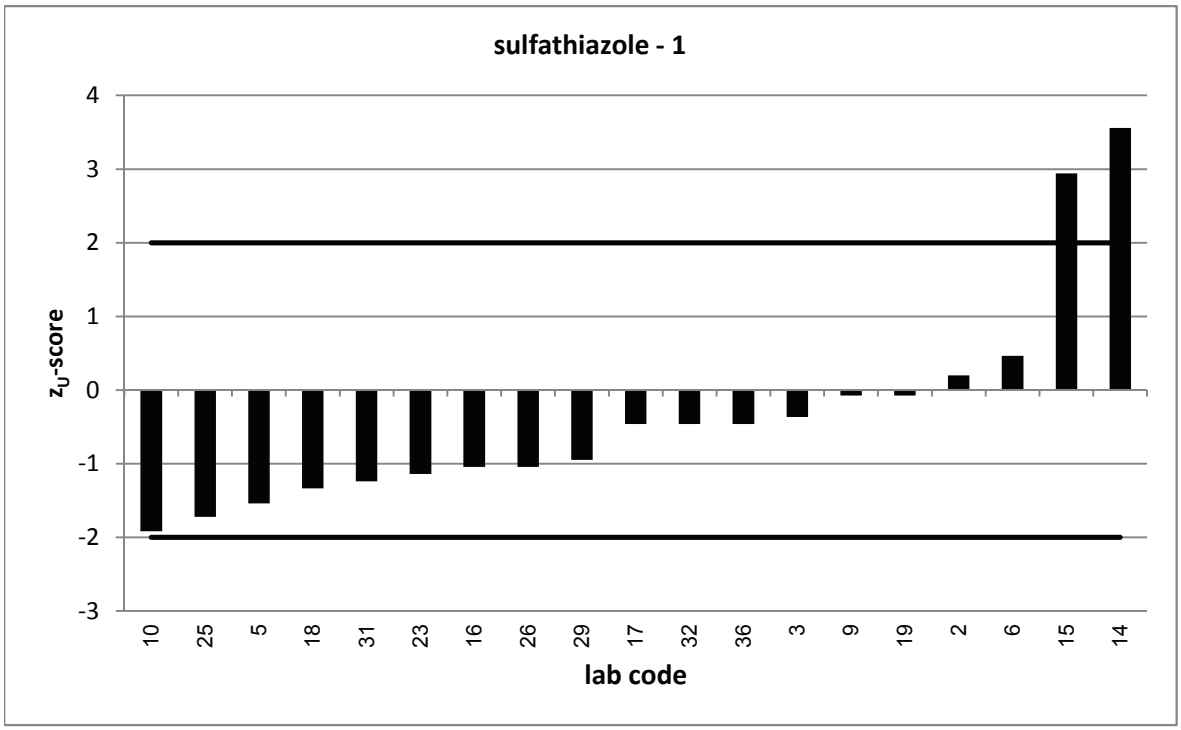

sulfamerazine - 3
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
36
16
15
25
6
14
21
lab code

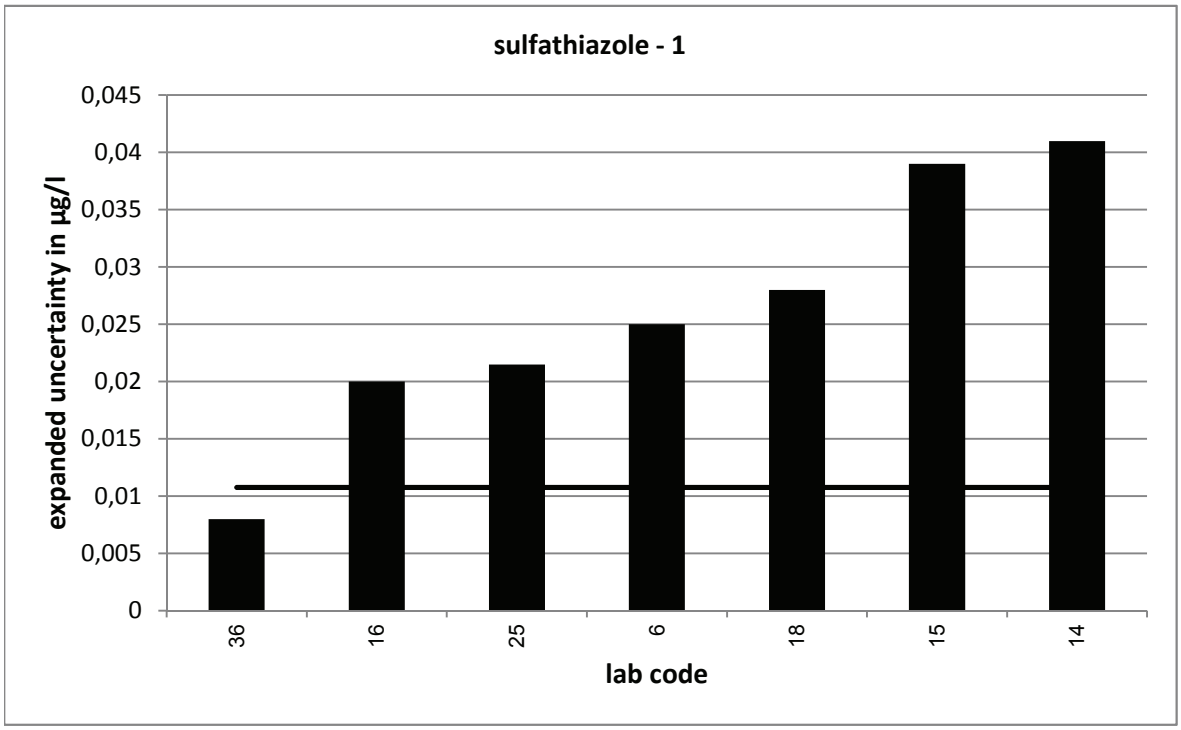

sulfamerazine - 3
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
36
16
6
21
15
14
lab code

| PT 5/16 - TW S2 | | sulfathiazole - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1248 | ± 0,0022 | | |
| upper tolerance limit [µg/l] | | 0,1474 | | | |
| lower tolerance limit [µg/l] | | 0,1041 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,127 | | | 0,2 | s |
| 3 | 0,121 | | | -0,4 | s |
| 5 | 0,1089 | | | -1,5 | s |
| 6 | 0,13 | 0,025 | 0,4 | 0,5 | s |
| 9 | 0,124 | | | -0,1 | s |
| 10 | 0,105 | | | -1,9 | s |
| 14 | 0,165 | 0,041 | 2,0 | 3,6 | u |
| 15 | 0,158 | 0,039 | 1,7 | 2,9 | q |
| 16 | 0,114 | 0,02 | -1,1 | -1,0 | s |
| 17 | 0,12 | | | -0,5 | s |
| 18 | 0,111 | 0,028 | -1,0 | -1,3 | s |
| 19 | 0,124 | | | -0,1 | s |
| 23 | 0,113 | | | -1,1 | s |
| 25 | 0,107 | 0,022 | -1,6 | -1,7 | s |
| 26 | 0,114 | | | -1,0 | s |
| 29 | 0,115 | | | -0,9 | s |
| 31 | 0,112 | | | -1,2 | s |
| 32 | 0,12 | | | -0,5 | s |
| 36 | 0,12 | 0,008 | -1,1 | -0,5 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfathiazole - 1
concentration in µg/l
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
10 25 5 18 31 23 16 26 29 17 32 36 3 9 19 2 6 15 14
lab code


sulfathiazole - 1
$z_U$-score
4
3
2
1
0
-1
-2
-3
10 25 5 18 31 23 16 26 29 17 32 36 3 9 19 2 6 15 14
lab code

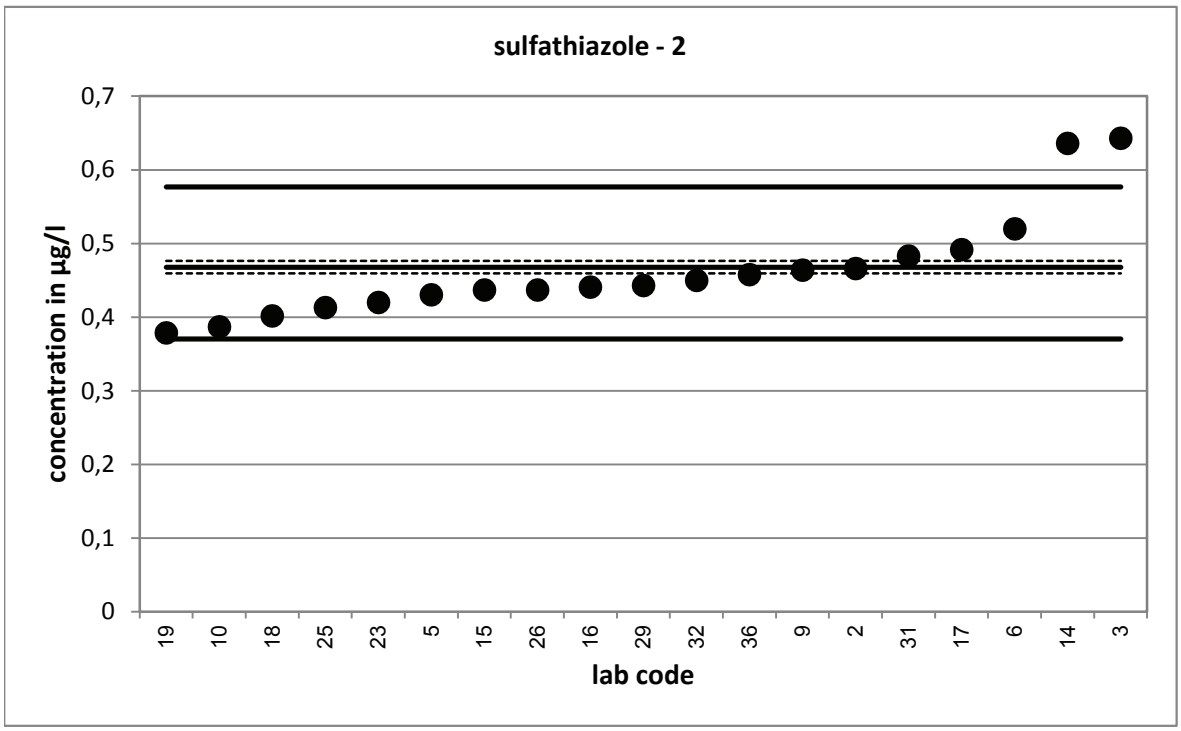

sulfathiazole - 1
expanded uncertainty in µg/l
0,045
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
36
16
25
6
18
15
14
lab code

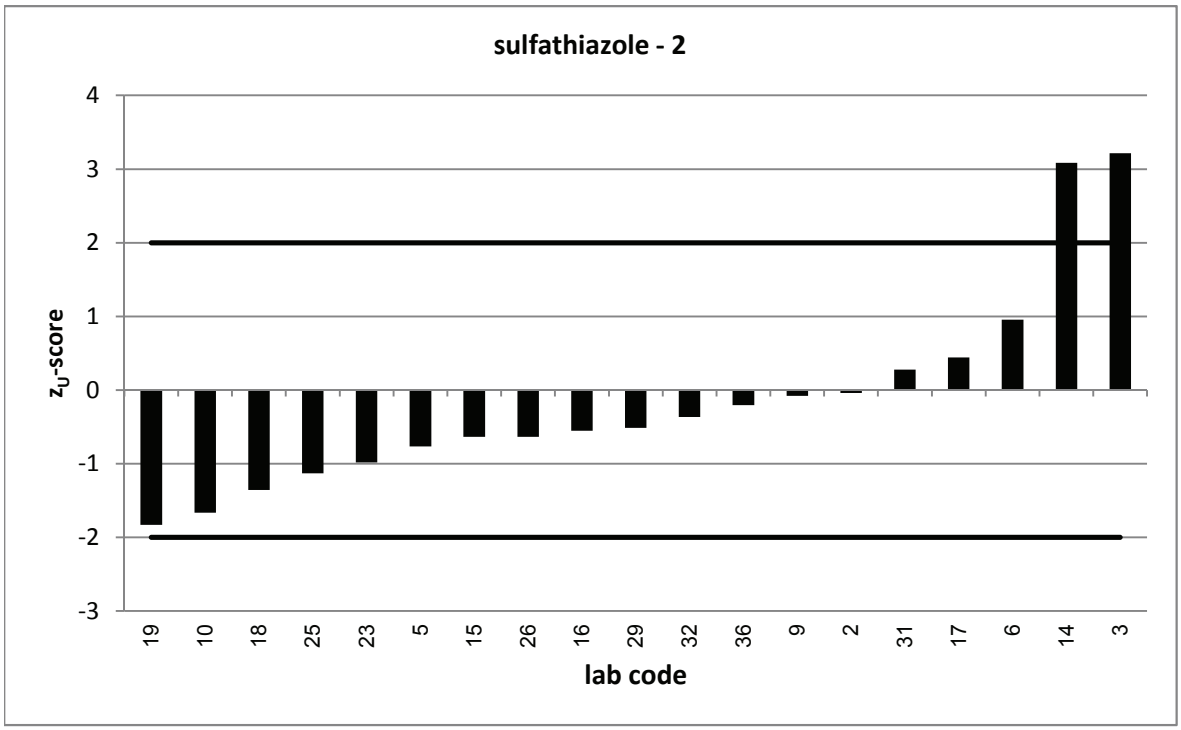

sulfathiazole - 1
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
36
16
18
6
15
14
lab code

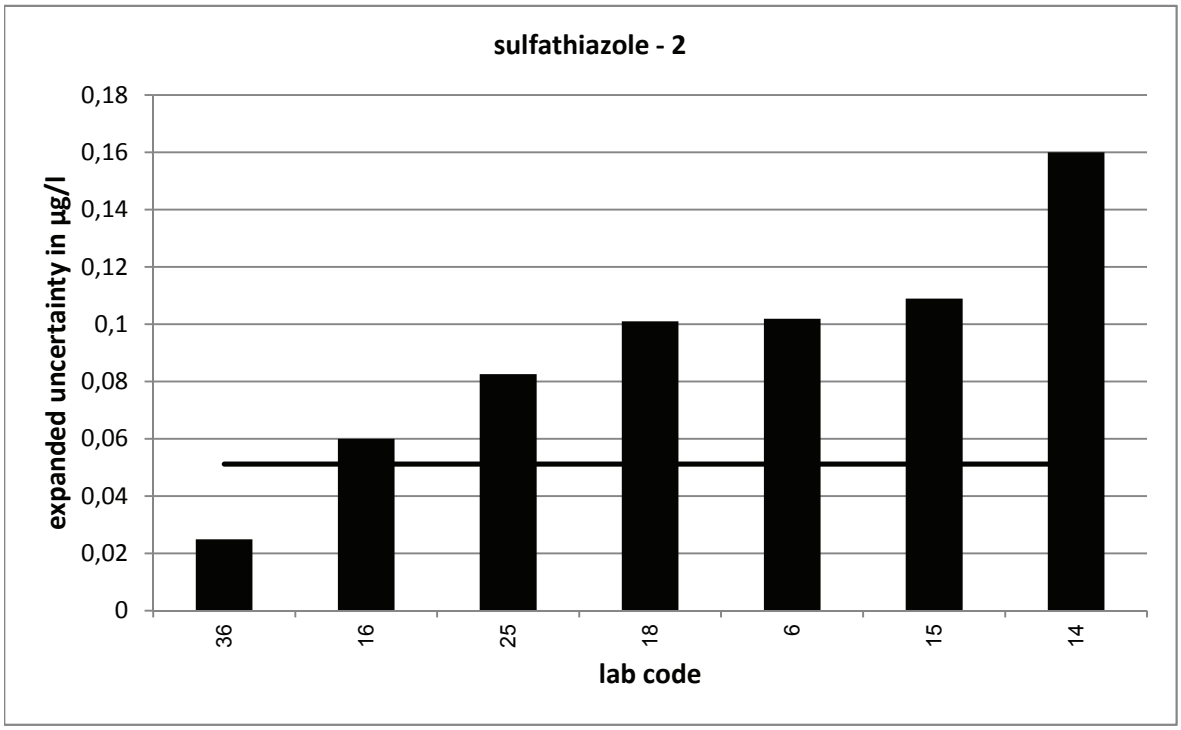
| PT 5/16 - TW S2 | | sulfathiazole - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,4678 | ± 0,0084 | | |
| upper tolerance limit [µg/l] | | 0,5768 | | | |
| lower tolerance limit [µg/l] | | 0,3706 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,466 | | | 0,0 | s |
| 3 | 0,643 | | | 3,2 | u |
| 5 | 0,4307 | | | -0,8 | s |
| 6 | 0,52 | 0,102 | 1,0 | 1,0 | s |
| 9 | 0,464 | | | -0,1 | s |
| 10 | 0,387 | | | -1,7 | s |
| 14 | 0,636 | 0,16 | 2,1 | 3,1 | u |
| 15 | 0,437 | 0,109 | -0,6 | -0,6 | s |
| 16 | 0,441 | 0,06 | -0,9 | -0,6 | s |
| 17 | 0,492 | | | 0,4 | s |
| 18 | 0,402 | 0,101 | -1,3 | -1,4 | s |
| 19 | 0,379 | | | -1,8 | s |
| 23 | 0,42 | | | -1,0 | s |
| 25 | 0,413 | 0,083 | -1,3 | -1,1 | s |
| 26 | 0,437 | | | -0,6 | s |
| 29 | 0,443 | | | -0,5 | s |
| 31 | 0,483 | | | 0,3 | s |
| 32 | 0,45 | | | -0,4 | s |
| 36 | 0,458 | 0,025 | -0,7 | -0,2 | s |

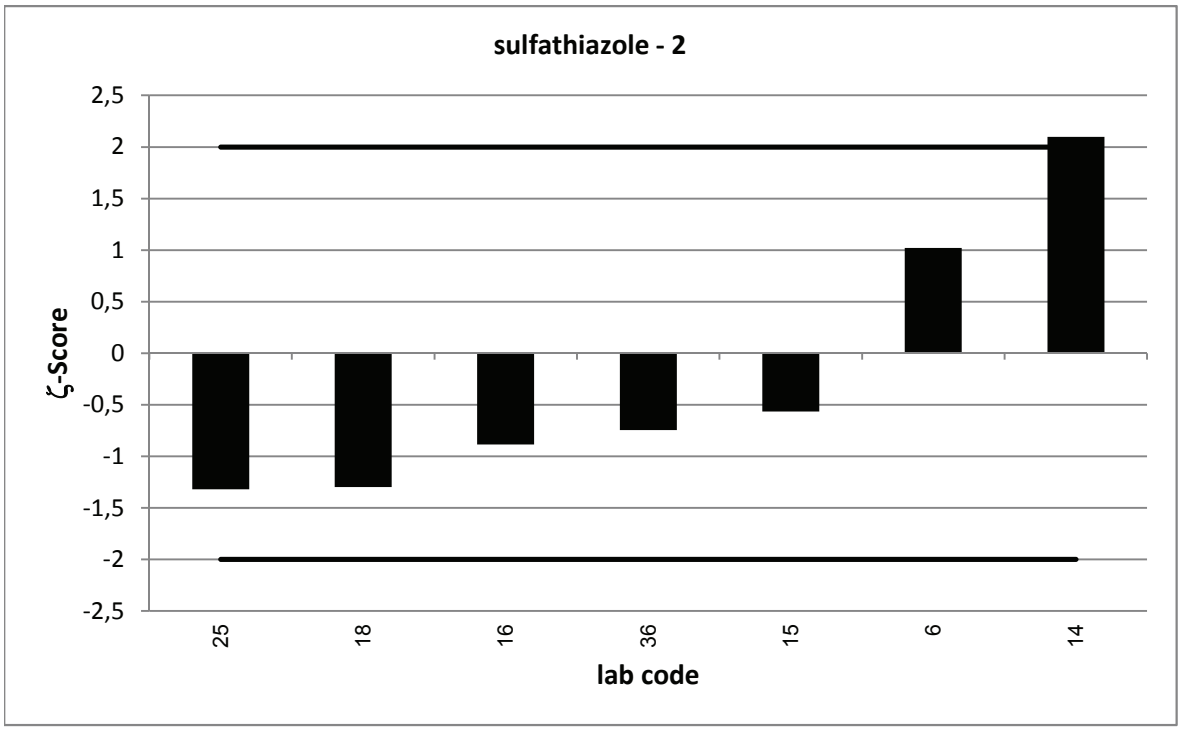
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfathiazole - 2
concentration in µg/l
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
19 10 18 25 23 5 15 26 16 29 32 36 9 2 31 17 6 14 3
lab code

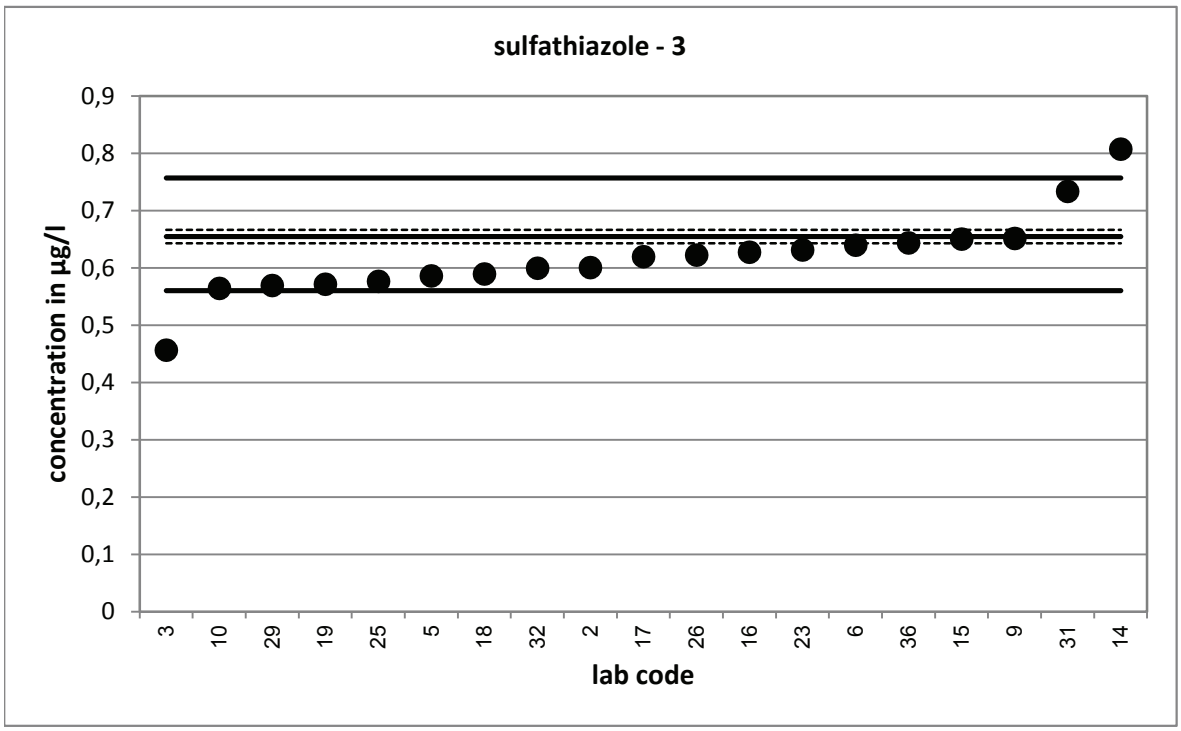

sulfathiazole - 2
$z_U$-score
4
3
2
1
0
-1
-2
-3
19 10 18 25 23 5 15 26 16 29 32 36 9 2 31 17 6 14 3
lab code

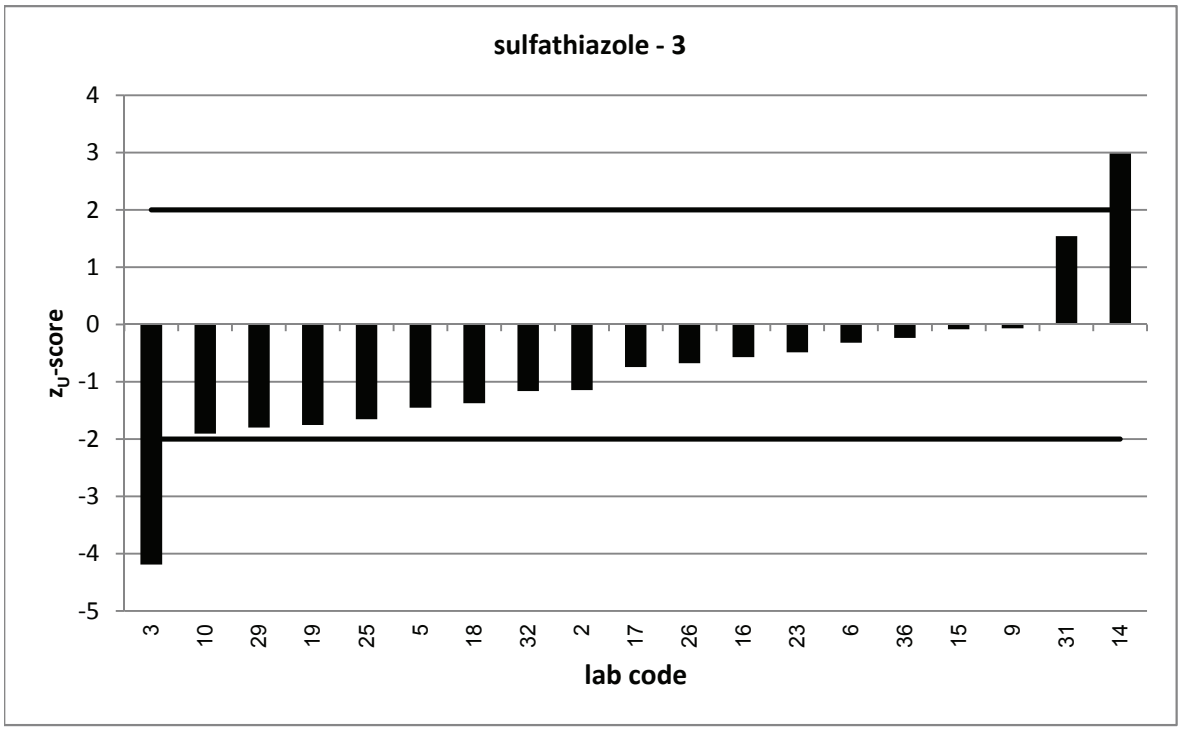

sulfathiazole - 2
expanded uncertainty in µg/l
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36
16
25
18
6
15
14
lab code

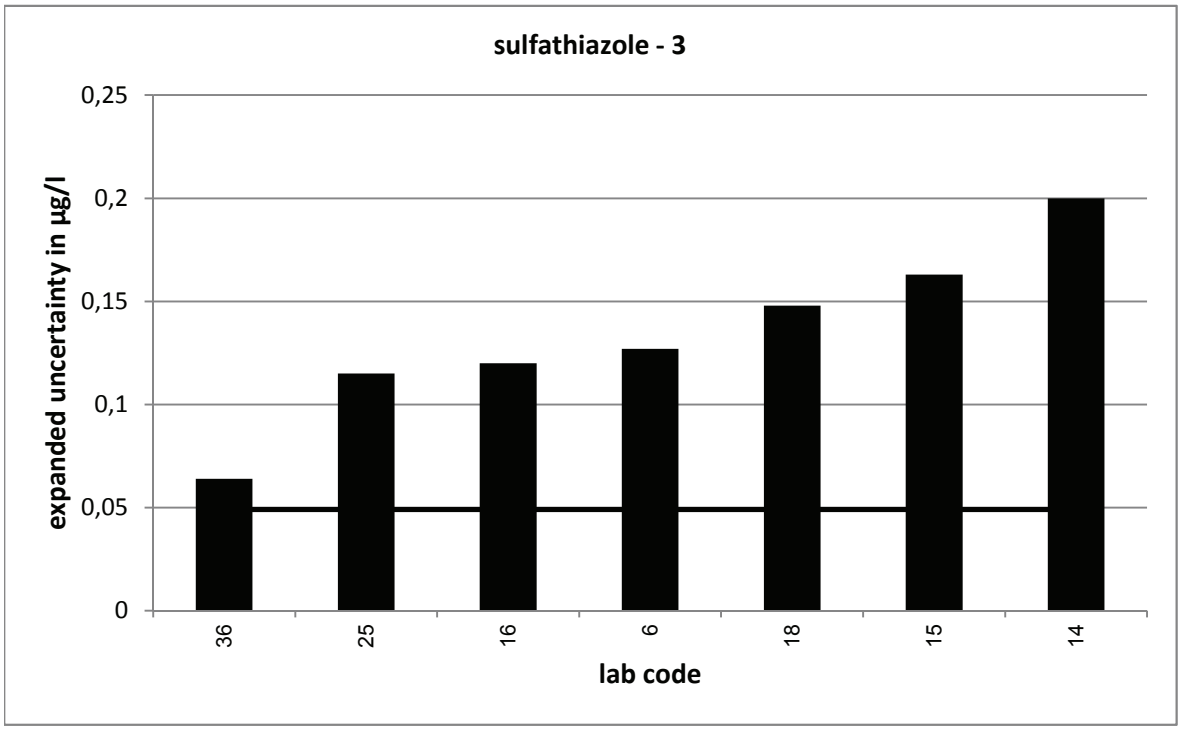

sulfathiazole - 2
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
18
16
36
15
6
14
lab code

| PT 5/16 - TW S2 | | sulfathiazole - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,655 | ± 0,0117 | | |
| upper tolerance limit [µg/l] | | 0,7574 | | | |
| lower tolerance limit [µg/l] | | 0,5604 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,601 | | | -1,1 | s |
| 3 | 0,457 | | | -4,2 | u |
| 5 | 0,5863 | | | -1,5 | s |
| 6 | 0,64 | 0,127 | -0,2 | -0,3 | s |
| 9 | 0,652 | | | -0,1 | s |
| 10 | 0,565 | | | -1,9 | s |
| 14 | 0,808 | 0,2 | 1,5 | 3,0 | u |
| 15 | 0,651 | 0,163 | 0,0 | -0,1 | s |
| 16 | 0,628 | 0,12 | -0,4 | -0,6 | s |
| 17 | 0,62 | | | -0,7 | s |
| 18 | 0,59 | 0,148 | -0,9 | -1,4 | s |
| 19 | 0,572 | | | -1,8 | s |
| 23 | 0,632 | | | -0,5 | s |
| 25 | 0,577 | 0,115 | -1,3 | -1,6 | s |
| 26 | 0,623 | | | -0,7 | s |
| 29 | 0,57 | | | -1,8 | s |
| 31 | 0,734 | | | 1,5 | s |
| 32 | 0,6 | | | -1,2 | s |
| 36 | 0,644 | 0,064 | -0,3 | -0,2 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfathiazole - 3
concentration in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
10
29
19
25
5
18
32
2
17
26
16
23
6
36
15
9
31
14
lab code


sulfathiazole - 3
$z_U$-score
4
3
2
1
0
-1
-2
-3
-4
-5
3
10
29
19
25
5
18
32
2
17
26
16
23
6
36
15
9
31
14
lab code

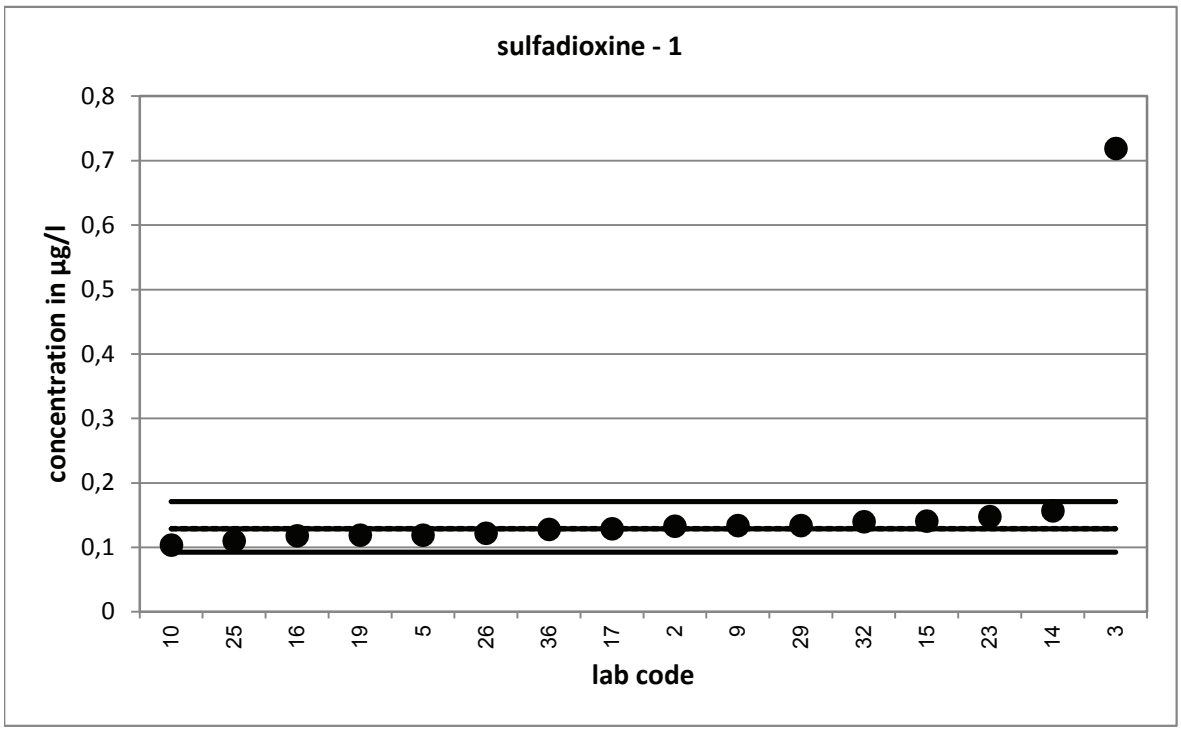

sulfathiazole - 3
expanded uncertainty in µg/l
0,25
0,2
0,15
0,1
0,05
0
36
25
16
6
18
15
14
lab code

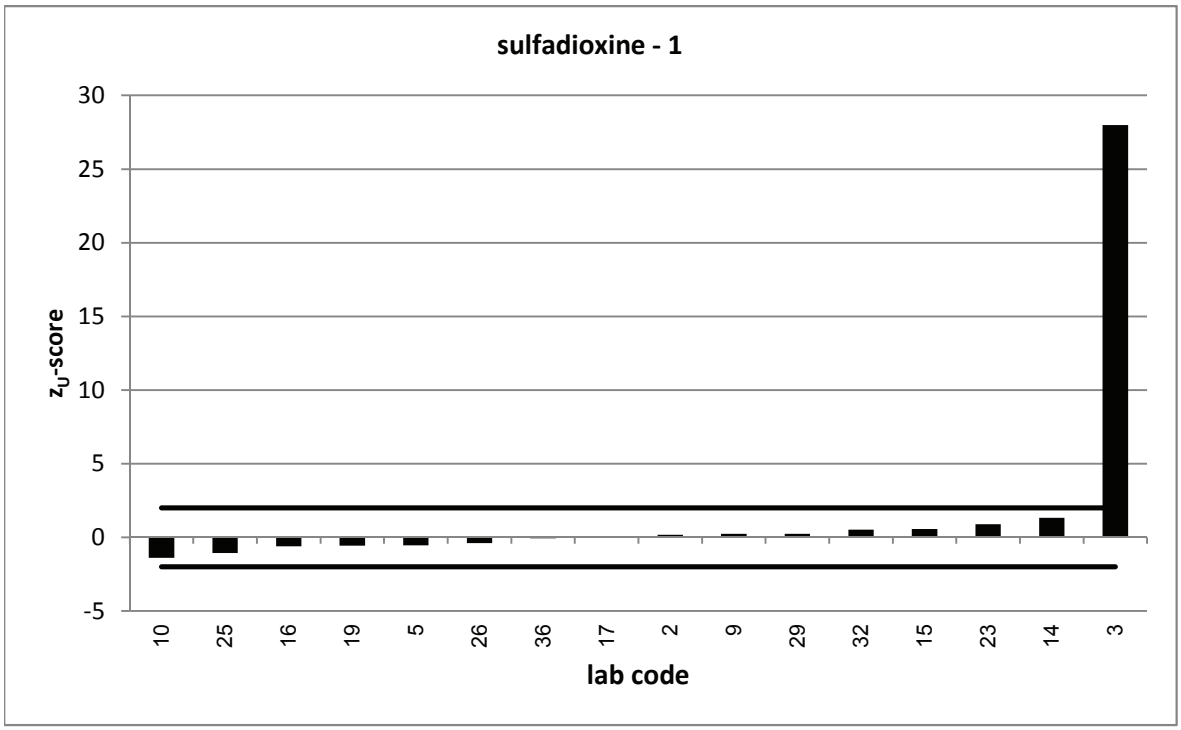

sulfathiazole - 3
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
18
16
36
6
15
14
lab code

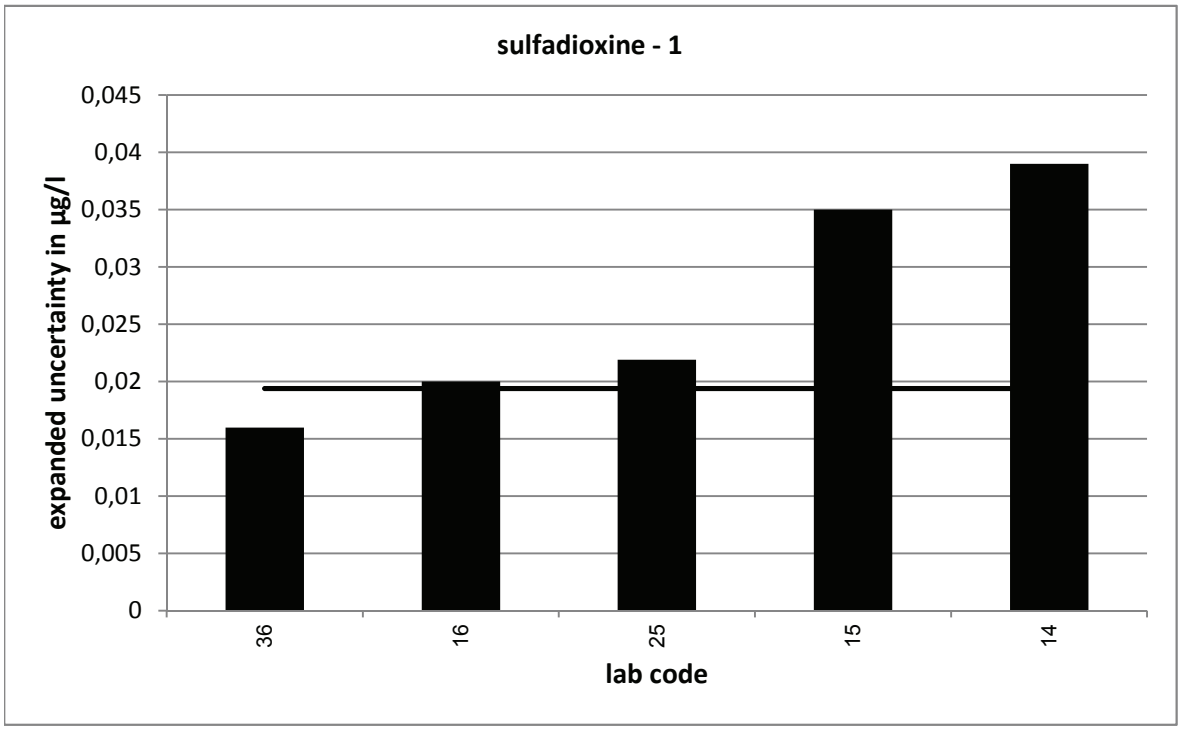
| PT 5/16 - TW S2 | | sulfadioxine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,129 | ± 0,0023 | | |
| upper tolerance limit [µg/l] | | 0,1712 | | | |
| lower tolerance limit [µg/l] | | 0,09274 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,133 | | | 0,2 | s |
| 3 | 0,719 | | | 28,0 | u |
| 5 | 0,1191 | | | -0,5 | s |
| 9 | 0,134 | | | 0,2 | s |
| 10 | 0,104 | | | -1,4 | s |
| 14 | 0,157 | 0,039 | 1,4 | 1,3 | s |
| 15 | 0,141 | 0,035 | 0,7 | 0,6 | s |
| 16 | 0,118 | 0,02 | -1,1 | -0,6 | s |
| 17 | 0,129 | | | 0,0 | s |
| 19 | 0,119 | | | -0,6 | s |
| 23 | 0,148 | | | 0,9 | s |
| 25 | 0,11 | 0,022 | -1,7 | -1,0 | s |
| 26 | 0,122 | | | -0,4 | s |
| 29 | 0,134 | | | 0,2 | s |
| 32 | 0,14 | | | 0,5 | s |
| 36 | 0,128 | 0,016 | -0,1 | -0,1 | s |

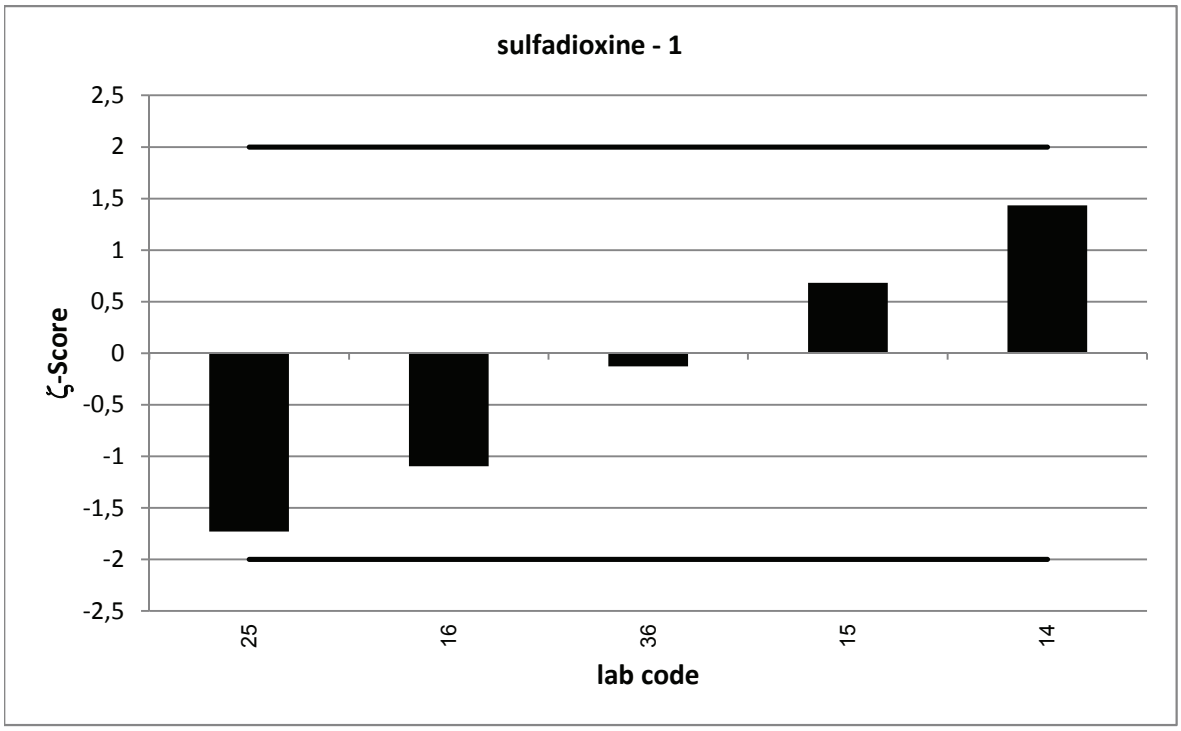
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadioxine - 1
concentration in µg/l
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
10
25
16
19
5
26
36
17
2
9
29
32
15
23
14
3
lab code


sulfadioxine - 1
$z_U$-score
30
25
20
15
10
5
0
-5
10
25
16
19
5
26
36
17
2
9
29
32
15
23
14
3
lab code

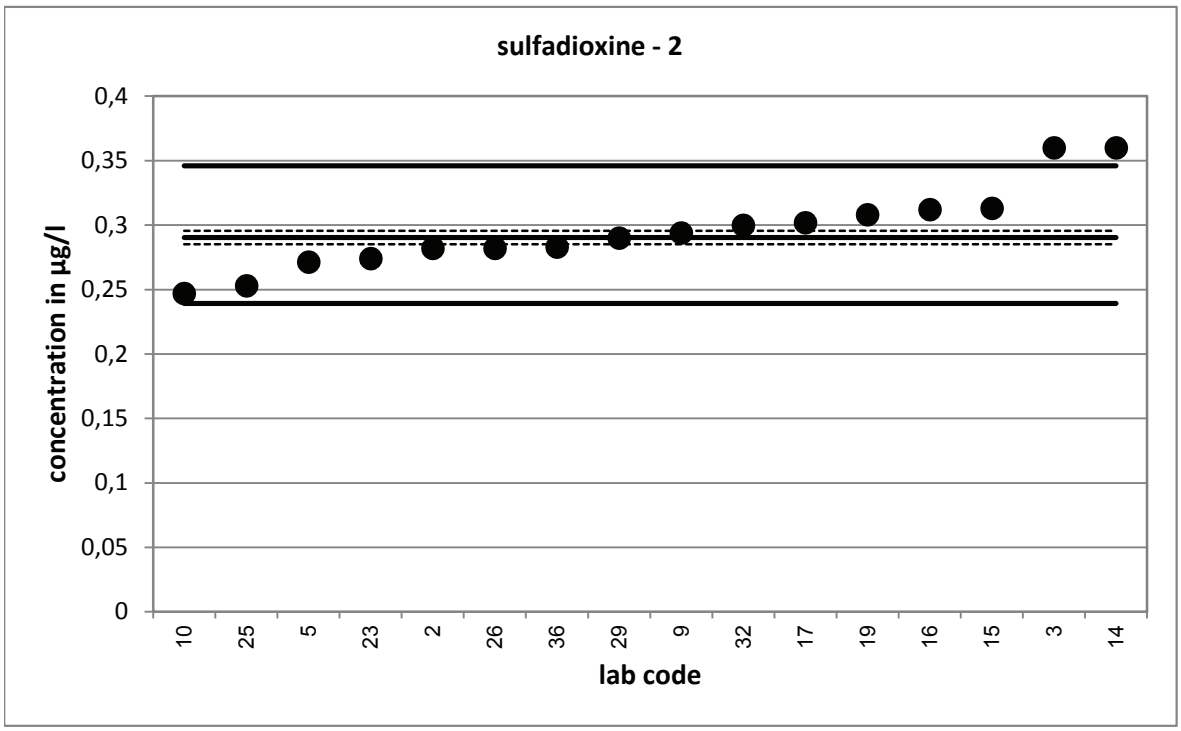

sulfadioxine - 1
expanded uncertainty in µg/l
0,045
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
36
16
25
15
14
lab code

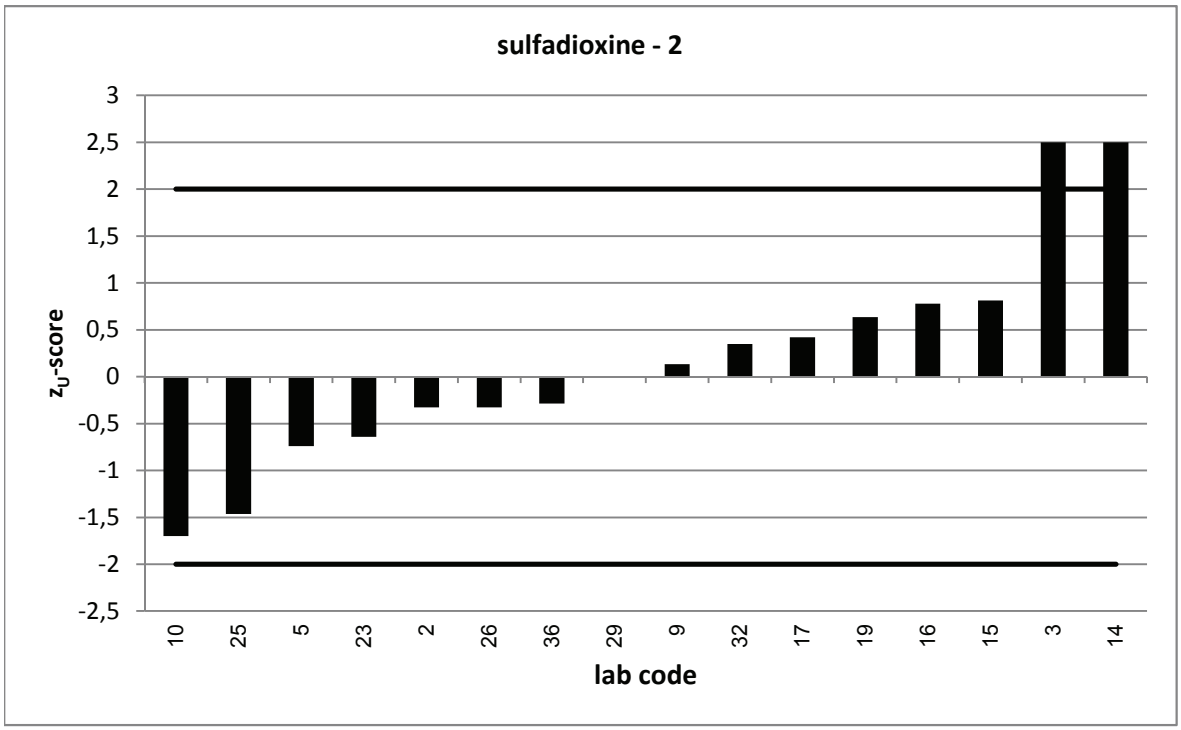

sulfadioxine - 1
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
16
36
15
14
lab code

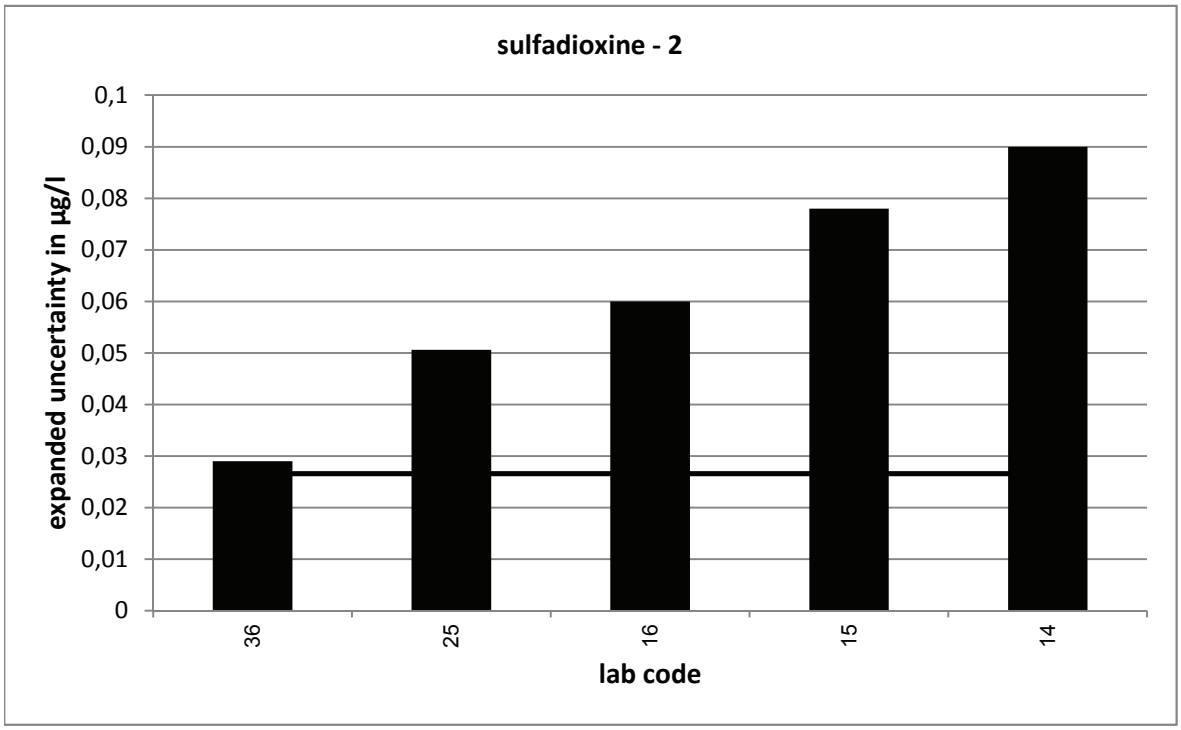
| PT 5/16 - TW S2 | | sulfadioxine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,2903 | ± 0,0052 | | |
| upper tolerance limit [µg/l] | | 0,3461 | | | |
| lower tolerance limit [µg/l] | | 0,2393 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,282 | | | -0,3 | s |
| 3 | 0,36 | | | 2,5 | q |
| 5 | 0,2714 | | | -0,7 | s |
| 9 | 0,294 | | | 0,1 | s |
| 10 | 0,247 | | | -1,7 | s |
| 14 | 0,36 | 0,09 | 1,5 | 2,5 | q |
| 15 | 0,313 | 0,078 | 0,6 | 0,8 | s |
| 16 | 0,312 | 0,06 | 0,7 | 0,8 | s |
| 17 | 0,302 | | | 0,4 | s |
| 19 | 0,308 | | | 0,6 | s |
| 23 | 0,274 | | | -0,6 | s |
| 25 | 0,253 | 0,051 | -1,5 | -1,5 | s |
| 26 | 0,282 | | | -0,3 | s |
| 29 | 0,29 | | | 0,0 | s |
| 32 | 0,3 | | | 0,3 | s |
| 36 | 0,283 | 0,029 | -0,5 | -0,3 | s |

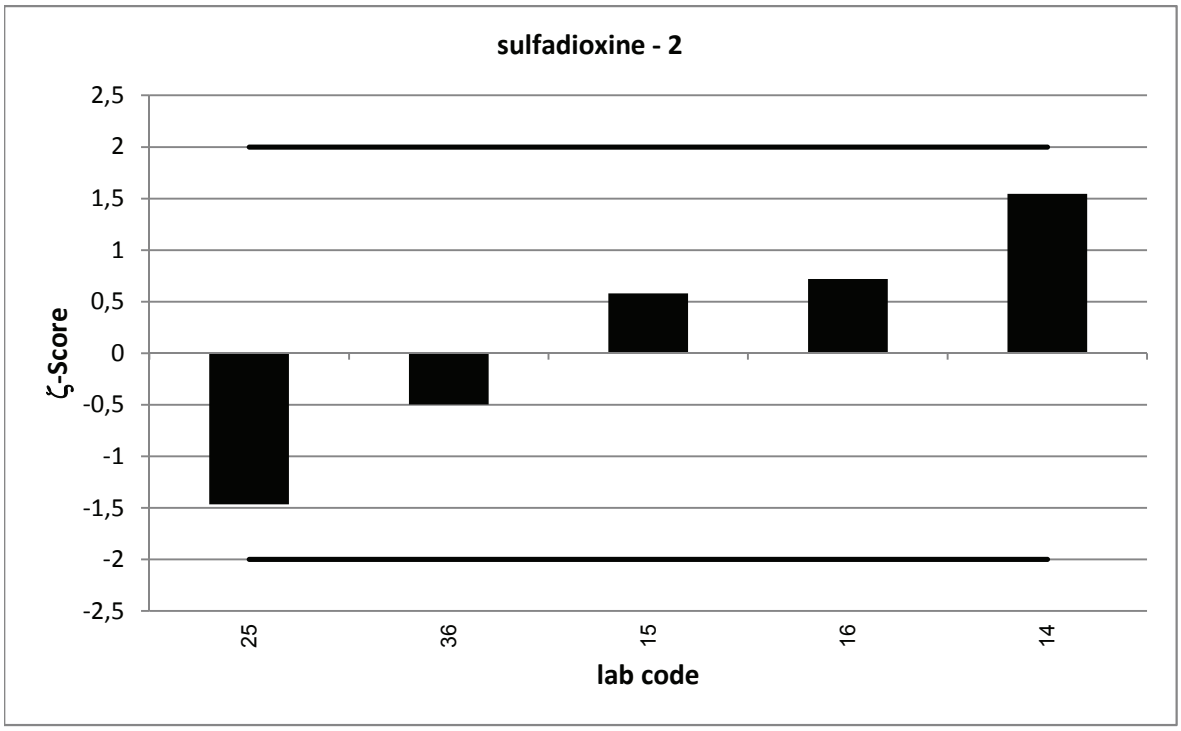
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadioxine - 2
concentration in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
10
25
5
23
2
26
36
29
9
32
17
19
16
15
3
14
lab code


sulfadioxine - 2
$z_U$-score
3
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
10
25
5
23
2
26
36
29
9
32
17
19
16
15
3
14
lab code

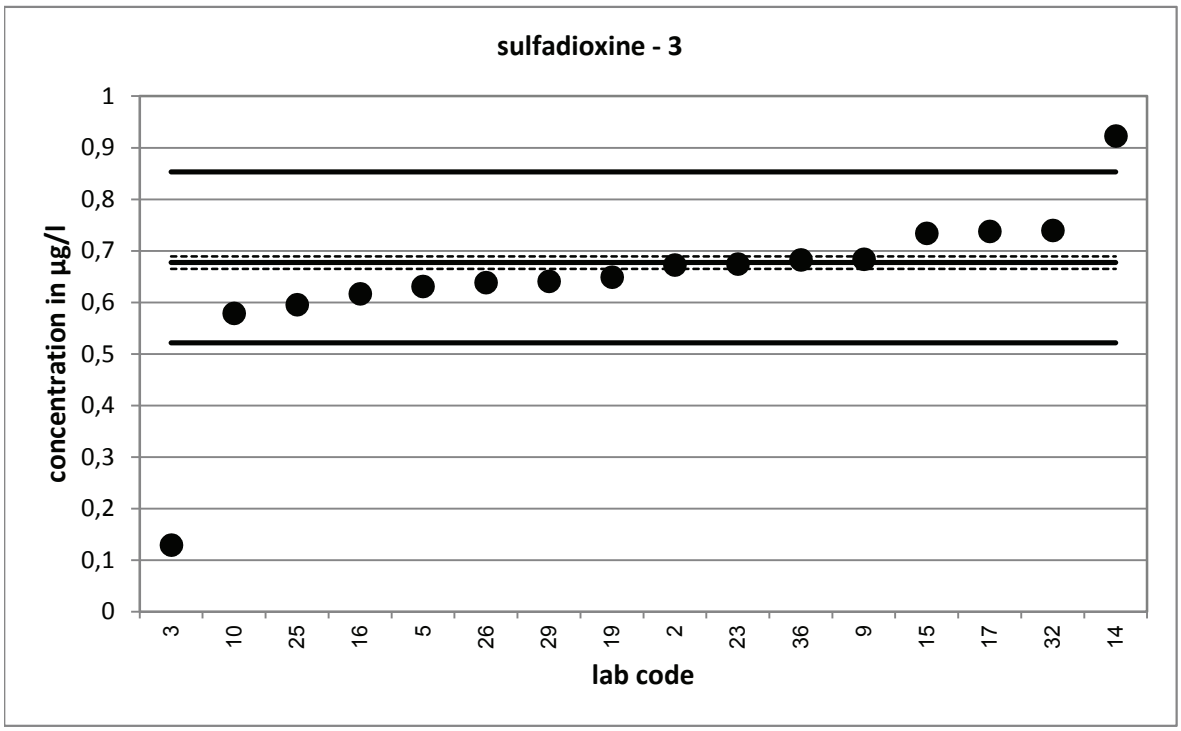

sulfadioxine - 2
expanded uncertainty in µg/l
0,1
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0
36
25
16
15
14
lab code

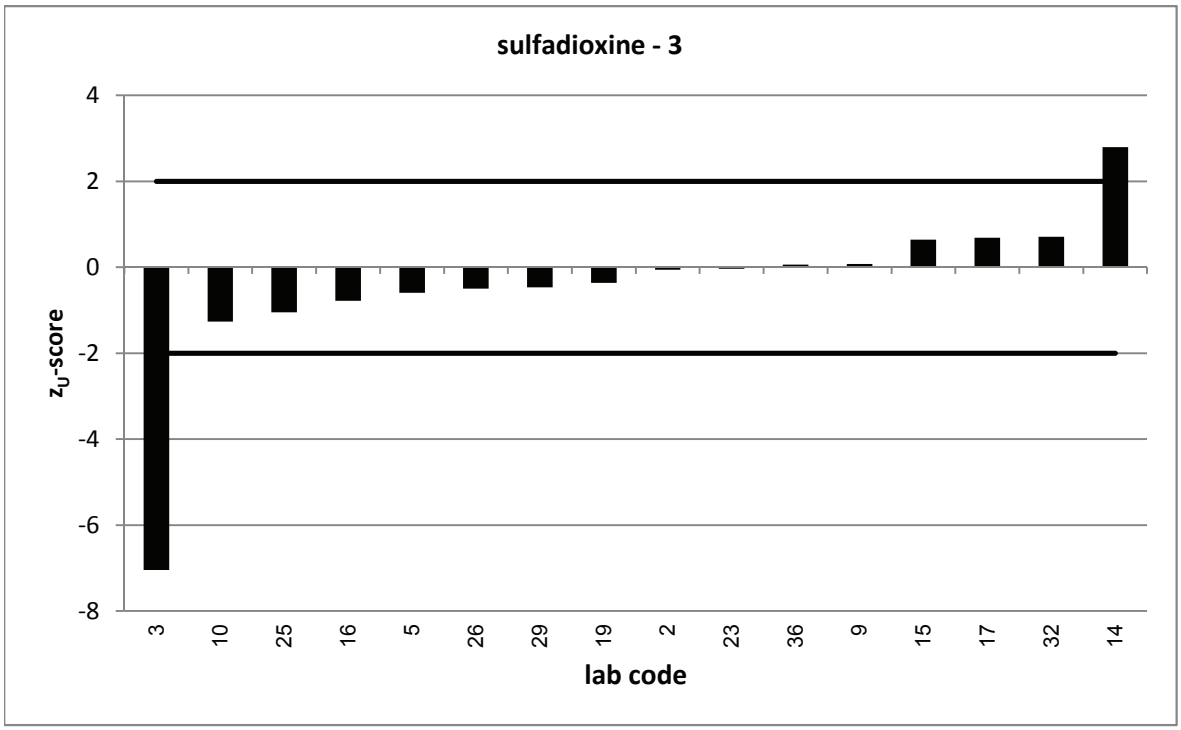

sulfadioxine - 2
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
36
15
16
14
lab code

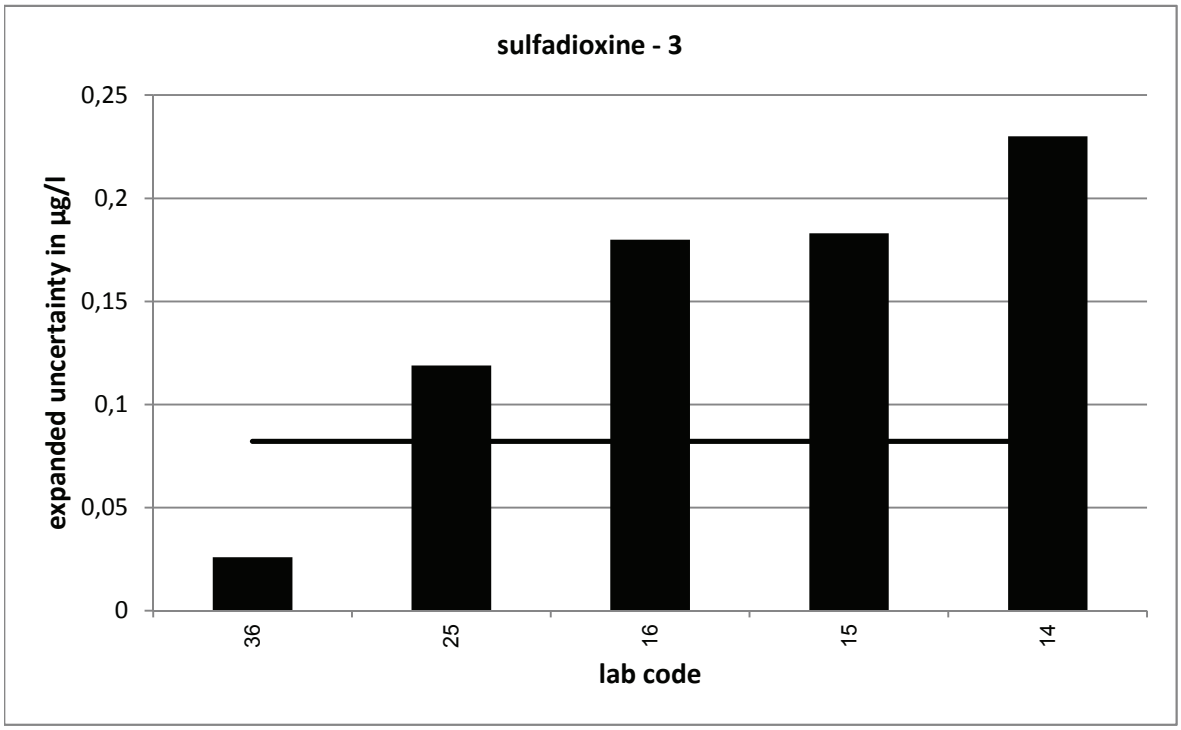
| PT 5/16 - TW S2 | | sulfadioxine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | | 0,6774 | ± 0,0121 | |
| upper tolerance limit [µg/l] | | | 0,8529 | | |
| lower tolerance limit [µg/l] | | | 0,522 | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,673 | | | -0,1 | s |
| 3 | 0,13 | | | -7,0 | u |
| 5 | 0,6313 | | | -0,6 | s |
| 9 | 0,684 | | | 0,1 | s |
| 10 | 0,579 | | | -1,3 | s |
| 14 | 0,923 | 0,23 | 2,1 | 2,8 | q |
| 15 | 0,734 | 0,183 | 0,6 | 0,6 | s |
| 16 | 0,617 | 0,18 | -0,7 | -0,8 | s |
| 17 | 0,738 | | | 0,7 | s |
| 19 | 0,649 | | | -0,4 | s |
| 23 | 0,675 | | | 0,0 | s |
| 25 | 0,596 | 0,119 | -1,4 | -1,0 | s |
| 26 | 0,639 | | | -0,5 | s |
| 29 | 0,641 | | | -0,5 | s |
| 32 | 0,74 | | | 0,7 | s |
| 36 | 0,683 | 0,026 | 0,4 | 0,1 | s |

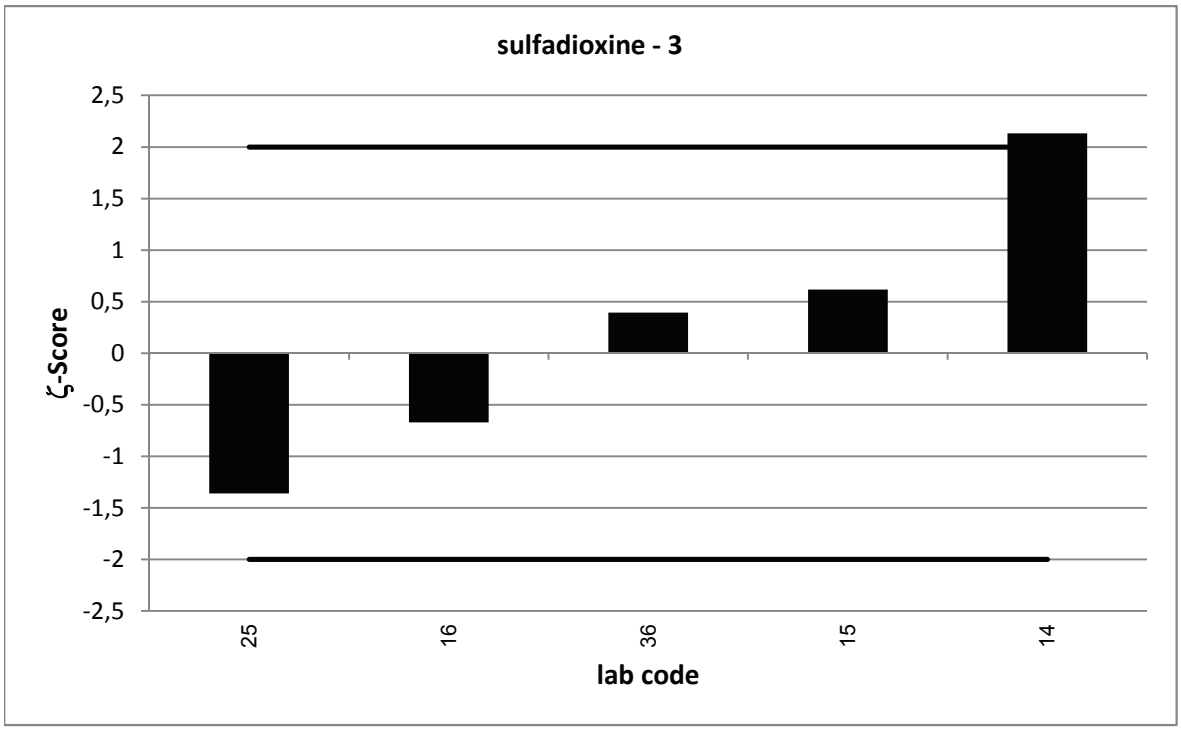
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadioxine - 3
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
10
25
16
5
26
29
19
2
23
36
9
15
17
32
14
lab code

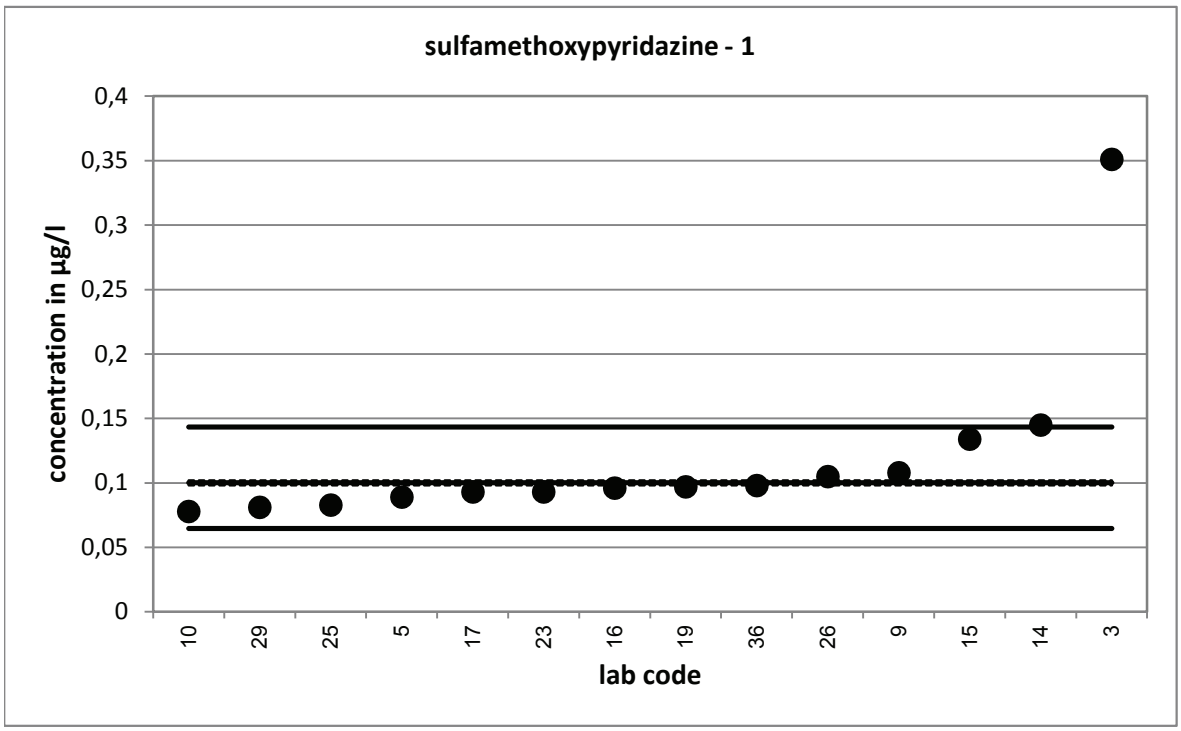

sulfadioxine - 3
$z_U$-score
4
2
0
-2
-4
-6
-8
3
10
25
16
5
26
29
19
2
23
36
9
15
17
32
14
lab code

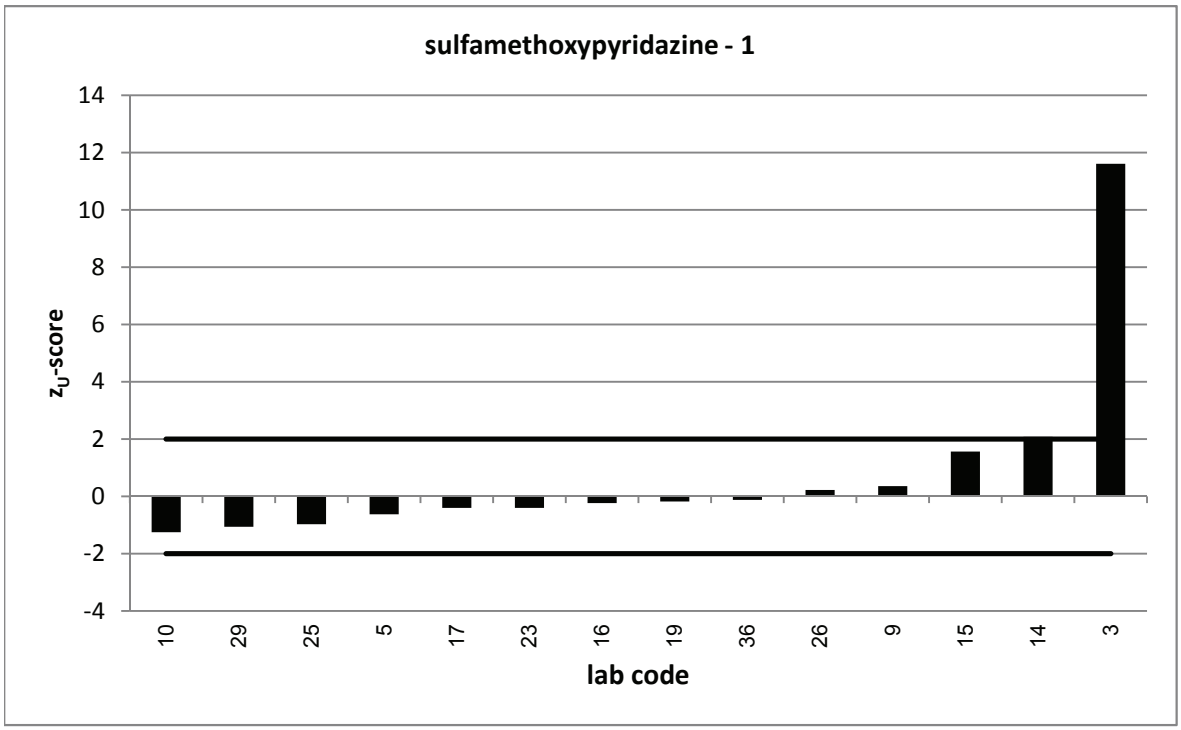

sulfadioxine - 3
expanded uncertainty in µg/l
0,25
0,2
0,15
0,1
0,05
0
36
25
16
15
14
lab code

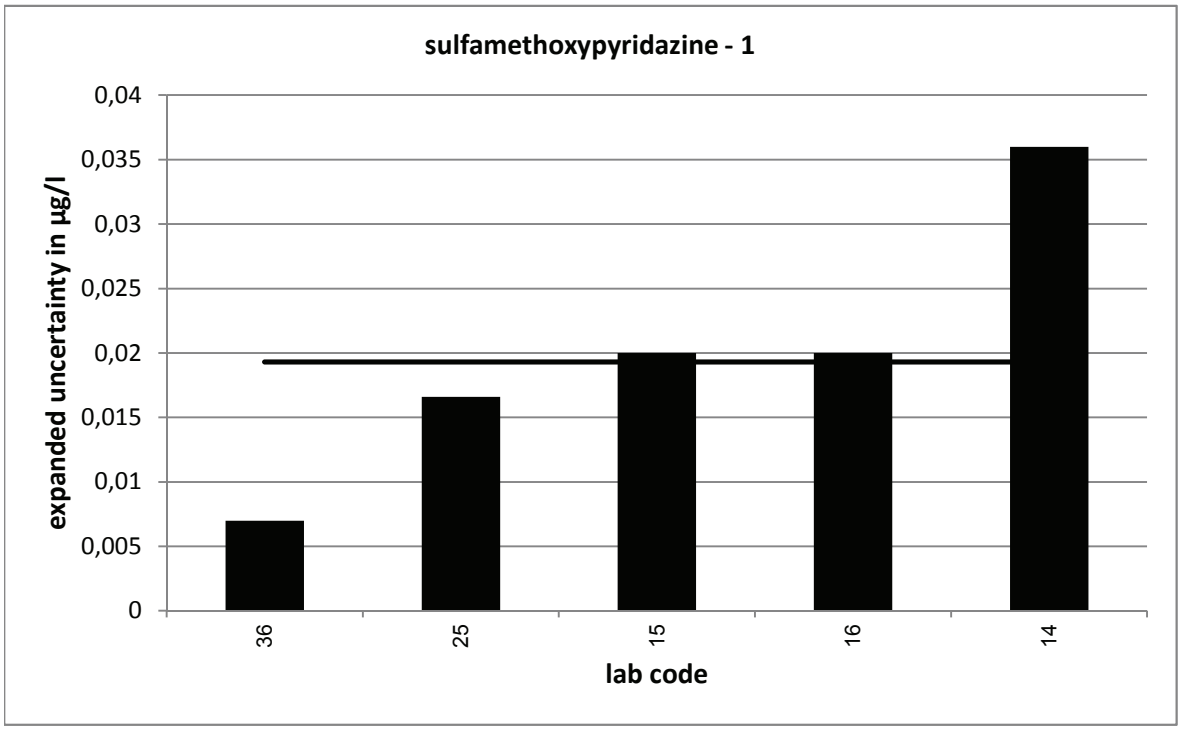

sulfadioxine - 3
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
16
36
15
14
lab code

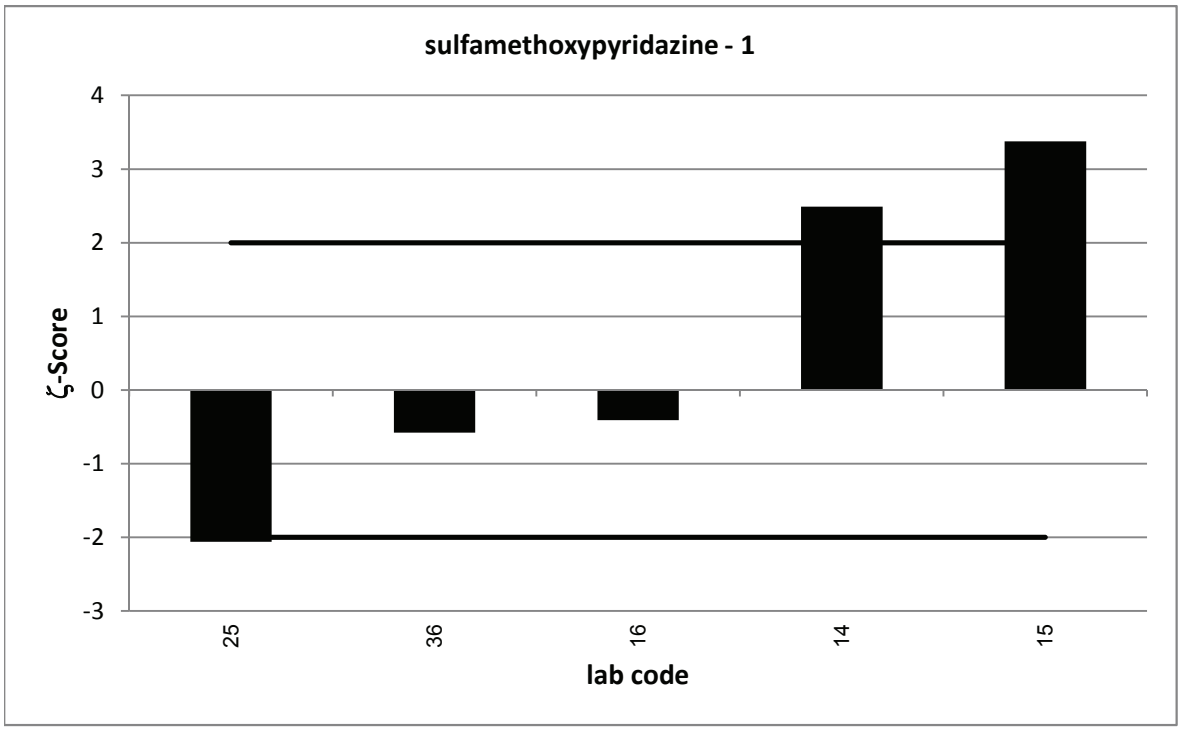
| PT 5/16 - TW S2 | | sulfamethoxypyridazine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1001 | ± 0,0019 | | |
| upper tolerance limit [µg/l] | | 0,1433 | | | |
| lower tolerance limit [µg/l] | | 0,06456 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,351 | | | 11,6 | u |
| 5 | 0,0891 | | | -0,6 | s |
| 9 | 0,108 | | | 0,4 | s |
| 10 | 0,078 | | | -1,2 | s |
| 14 | 0,145 | 0,036 | 2,5 | 2,1 | q |
| 15 | 0,134 | 0,02 | 3,4 | 1,6 | s |
| 16 | 0,096 | 0,02 | -0,4 | -0,2 | s |
| 17 | 0,093 | | | -0,4 | s |
| 19 | 0,097 | | | -0,2 | s |
| 23 | 0,093 | | | -0,4 | s |
| 25 | 0,0829 | 0,017 | -2,1 | -1,0 | s |
| 26 | 0,105 | | | 0,2 | s |
| 29 | 0,0813 | | | -1,1 | s |
| 36 | 0,098 | 0,007 | -0,6 | -0,1 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfamethoxypyridazine - 1
concentration in µg/l
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
10
29
25
5
17
23
16
19
36
26
9
15
14
3
lab code


sulfamethoxypyridazine - 1
$z_U$-score
14
12
10
8
6
4
2
0
-2
-4
10
29
25
5
17
23
16
19
36
26
9
15
14
3
lab code

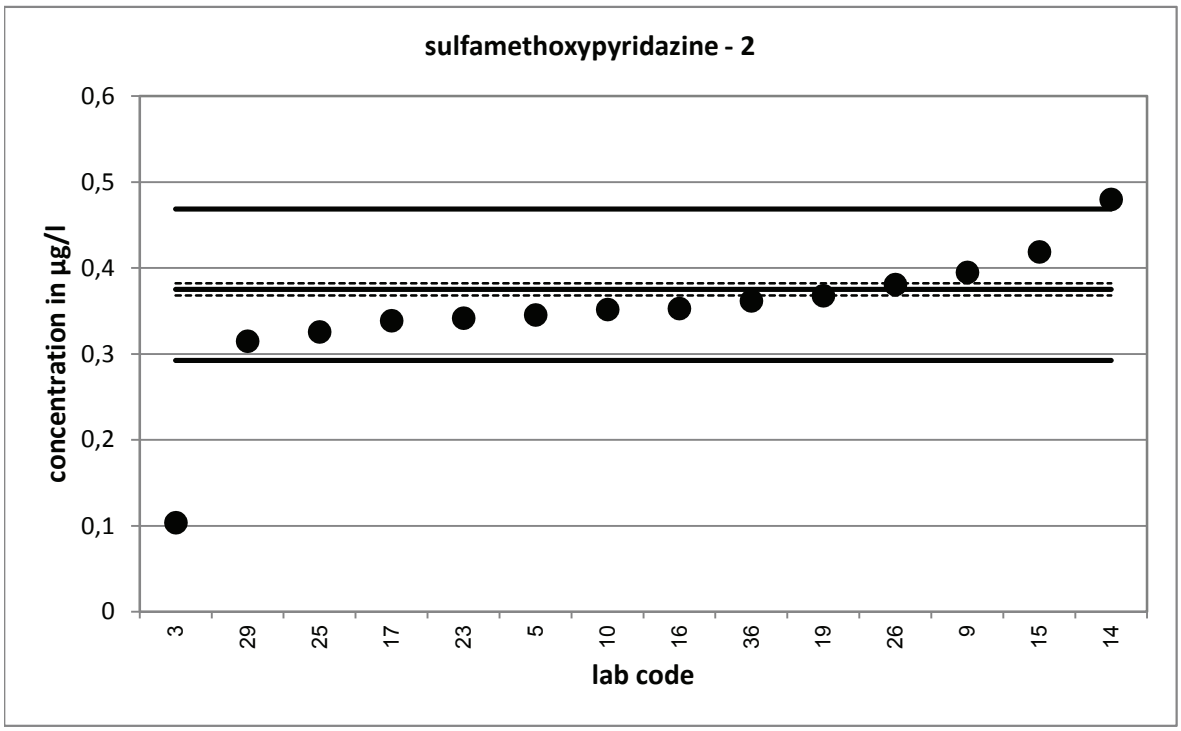

sulfamethoxypyridazine - 1
expanded uncertainty in µg/l
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
36
25
15
16
14
lab code

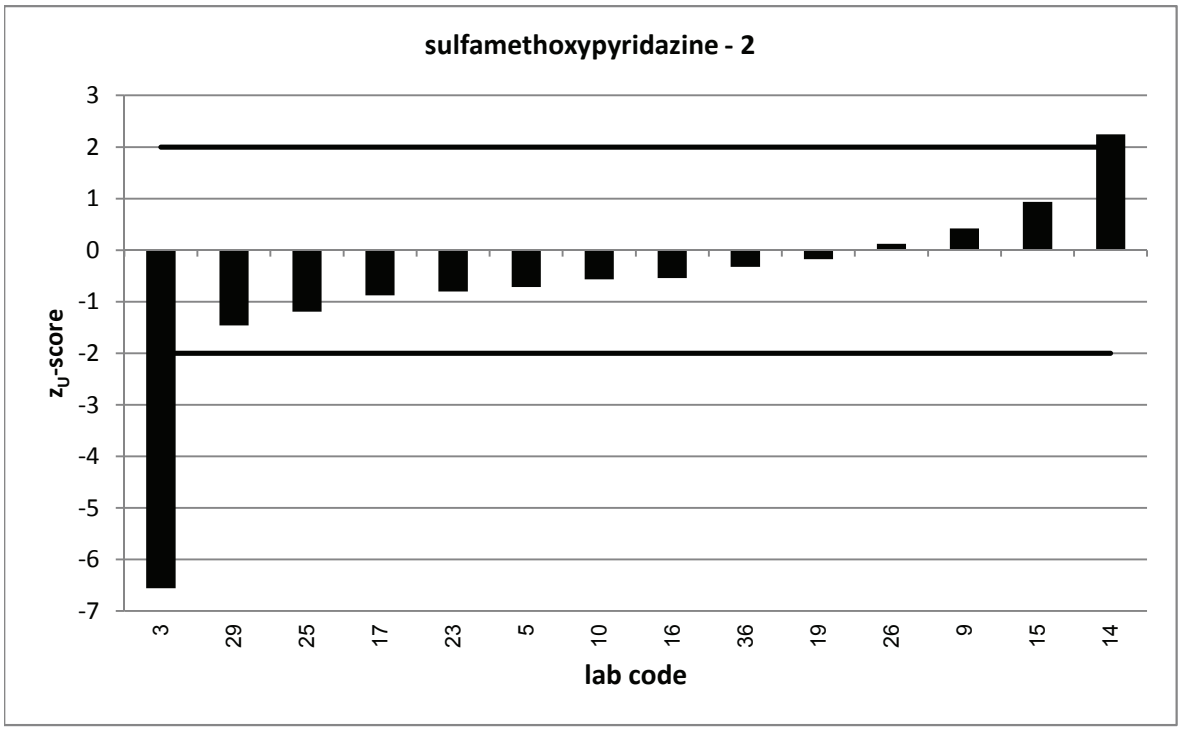

sulfamethoxypyridazine - 1
ζ-Score
4
3
2
1
0
-1
-2
-3
25
36
16
14
15
lab code

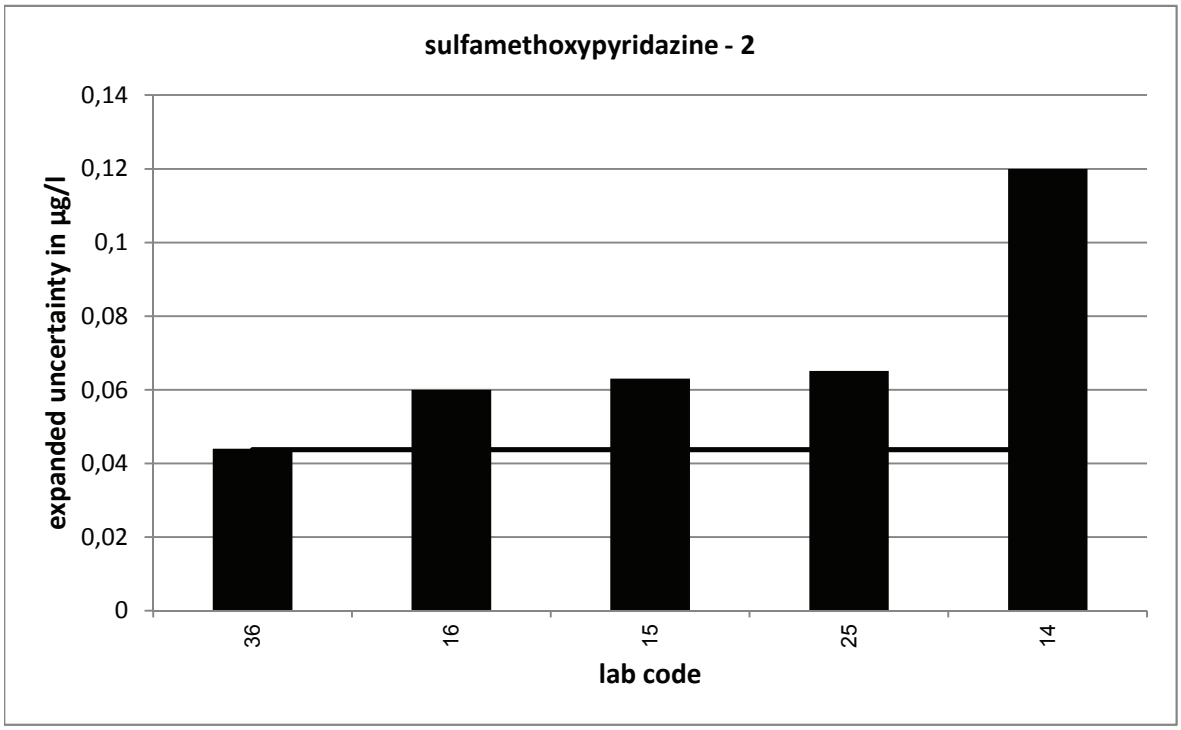
| PT 5/16 - TW S2 | | sulfamethoxypyridazine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,3753 | ± 0,0071 | | |
| upper tolerance limit [µg/l] | | 0,4687 | | | |
| lower tolerance limit [µg/l] | | 0,2925 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,104 | | | -6,6 | u |
| 5 | 0,3456 | | | -0,7 | s |
| 9 | 0,395 | | | 0,4 | s |
| 10 | 0,352 | | | -0,6 | s |
| 14 | 0,48 | 0,12 | 1,7 | 2,2 | q |
| 15 | 0,419 | 0,063 | 1,4 | 0,9 | s |
| 16 | 0,353 | 0,06 | -0,7 | -0,5 | s |
| 17 | 0,339 | | | -0,9 | s |
| 19 | 0,368 | | | -0,2 | s |
| 23 | 0,342 | | | -0,8 | s |
| 25 | 0,326 | 0,065 | -1,5 | -1,2 | s |
| 26 | 0,381 | | | 0,1 | s |
| 29 | 0,315 | | | -1,5 | s |
| 36 | 0,362 | 0,044 | -0,6 | -0,3 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfamethoxypyridazine - 2
concentration in µg/l
0,6
0,5
0,4
0,3
0,2
0,1
0
3
29
25
17
23
5
10
16
36
19
26
9
15
14
lab code

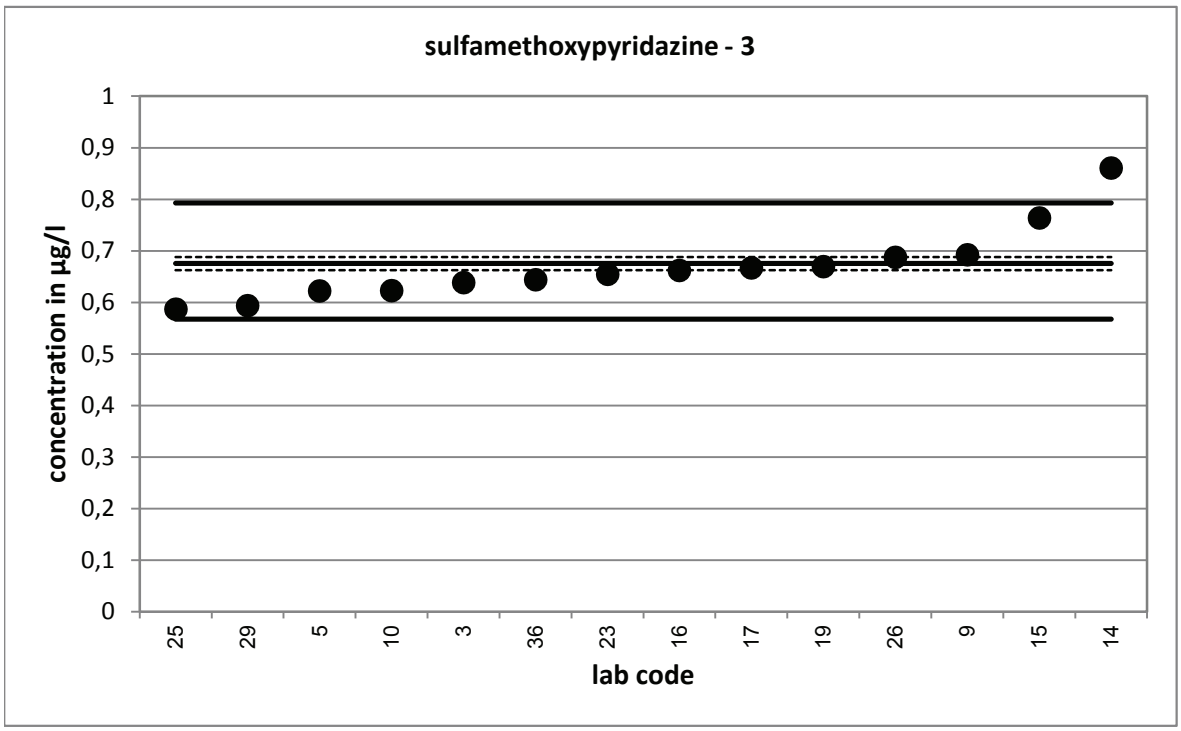

sulfamethoxypyridazine - 2
$z_U$-score
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
3
29
25
17
23
5
10
16
36
19
26
9
15
14
lab code

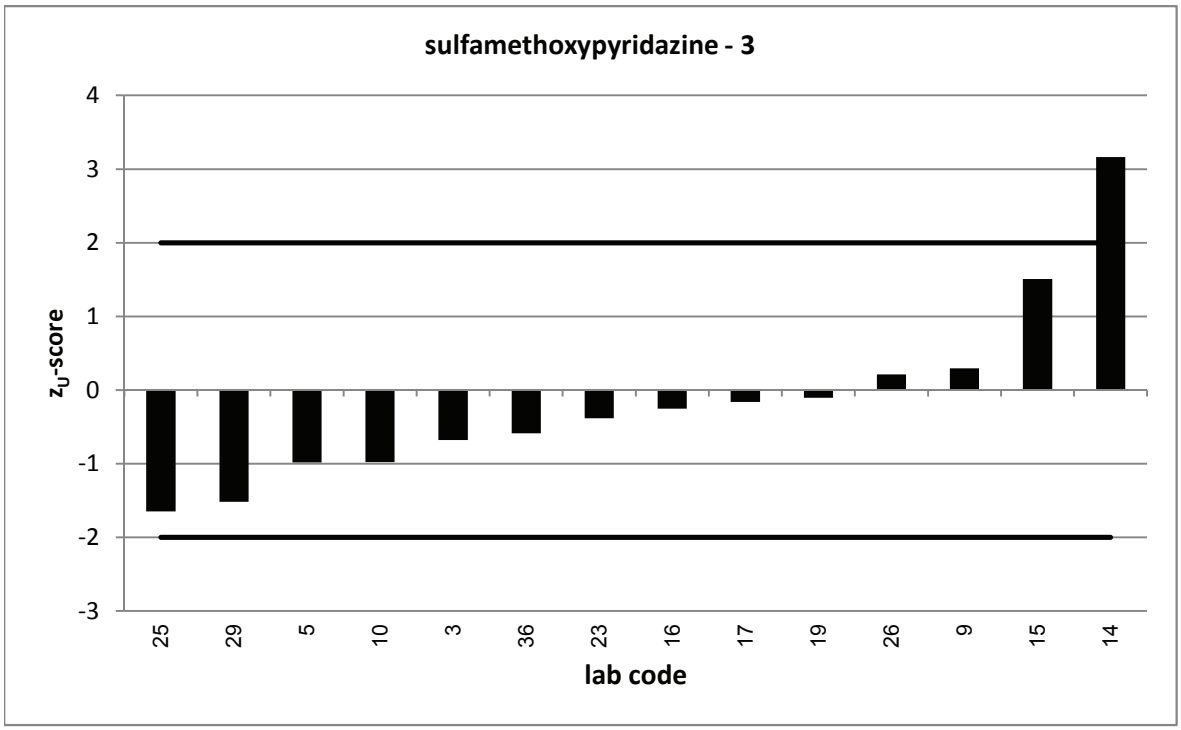

sulfamethoxypyridazine - 2
expanded uncertainty in µg/l
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36
16
15
25
14
lab code

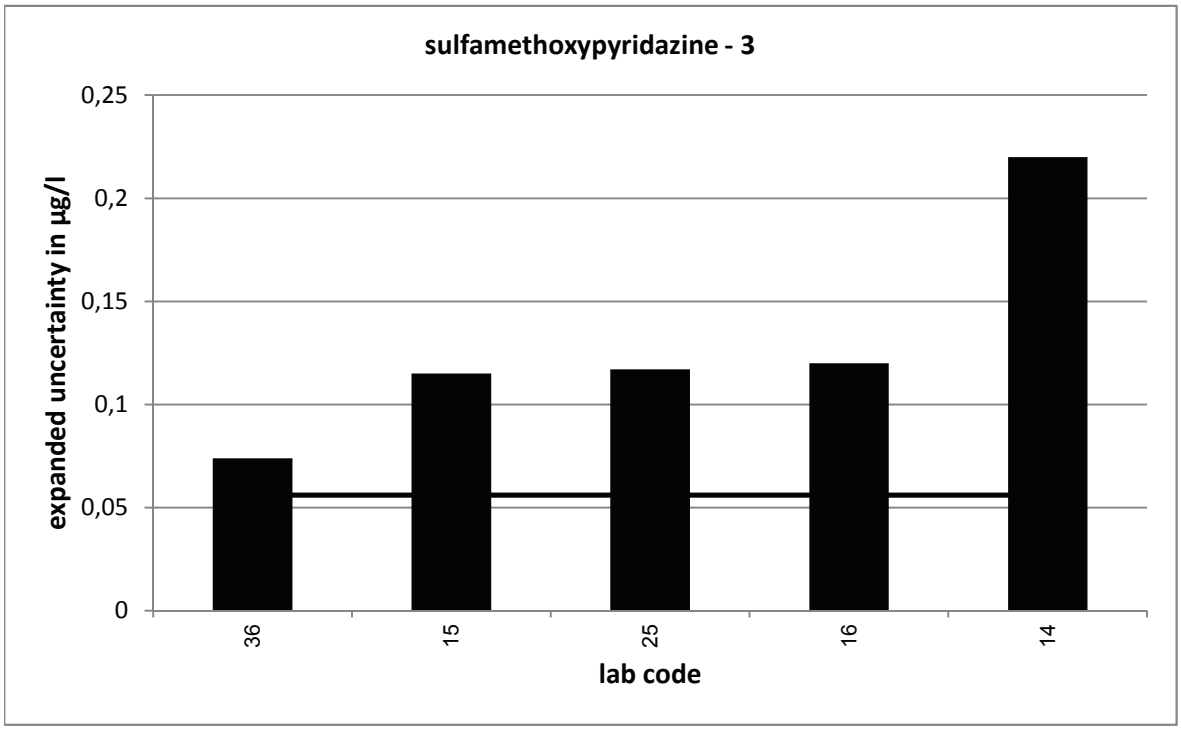

sulfamethoxypyridazine - 2
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
16
36
15
14
lab code

| PT 5/16 - TW S2 | | sulfamethoxypyridazine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,6756 | ± 0,0127 | | |
| upper tolerance limit [µg/l] | | 0,7928 | | | |
| lower tolerance limit [µg/l] | | 0,5679 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,639 | | | -0,7 | s |
| 5 | 0,6227 | | | -1,0 | s |
| 9 | 0,693 | | | 0,3 | s |
| 10 | 0,623 | | | -1,0 | s |
| 14 | 0,861 | 0,22 | 1,7 | 3,2 | u |
| 15 | 0,764 | 0,115 | 1,5 | 1,5 | s |
| 16 | 0,662 | 0,12 | -0,2 | -0,3 | s |
| 17 | 0,667 | | | -0,2 | s |
| 19 | 0,67 | | | -0,1 | s |
| 23 | 0,655 | | | -0,4 | s |
| 25 | 0,587 | 0,117 | -1,5 | -1,6 | s |
| 26 | 0,688 | | | 0,2 | s |
| 29 | 0,594 | | | -1,5 | s |
| 36 | 0,644 | 0,074 | -0,8 | -0,6 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfamethoxypyridazine - 3
concentration in µg/l
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
25
29
5
10
3
36
23
16
17
19
26
9
15
14
lab code

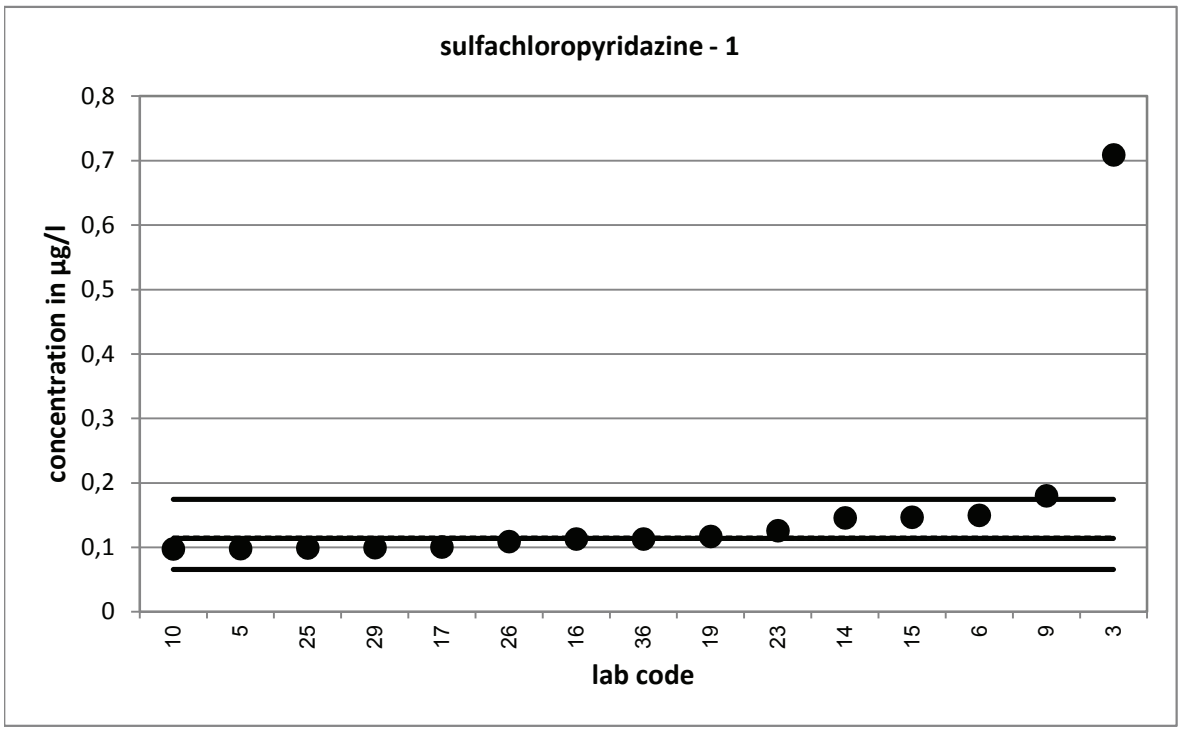

sulfamethoxypyridazine - 3
$z_U$-score
4
3
2
1
0
-1
-2
-3
25
29
5
10
3
36
23
16
17
19
26
9
15
14
lab code

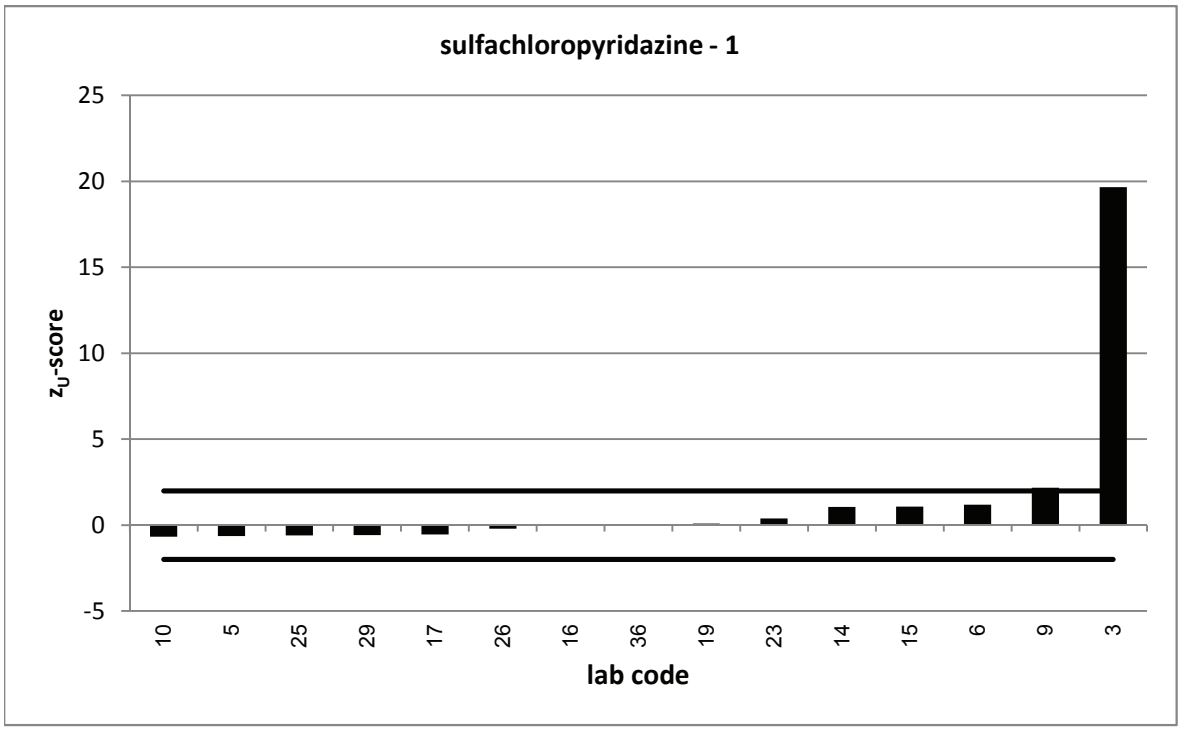

sulfamethoxypyridazine - 3
expanded uncertainty in µg/l
0,25
0,2
0,15
0,1
0,05
0
36
15
25
16
14
lab code

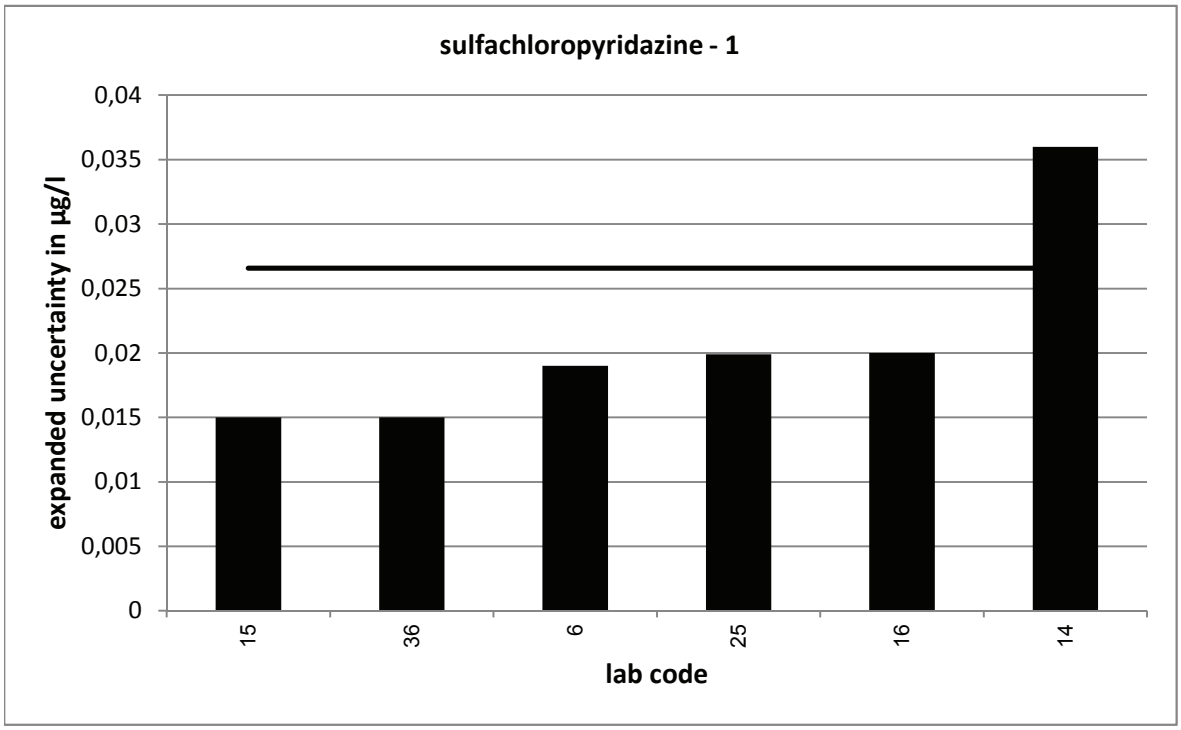

sulfamethoxypyridazine - 3
ζ-Score
2,5
2
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
25
36
16
15
14
lab code

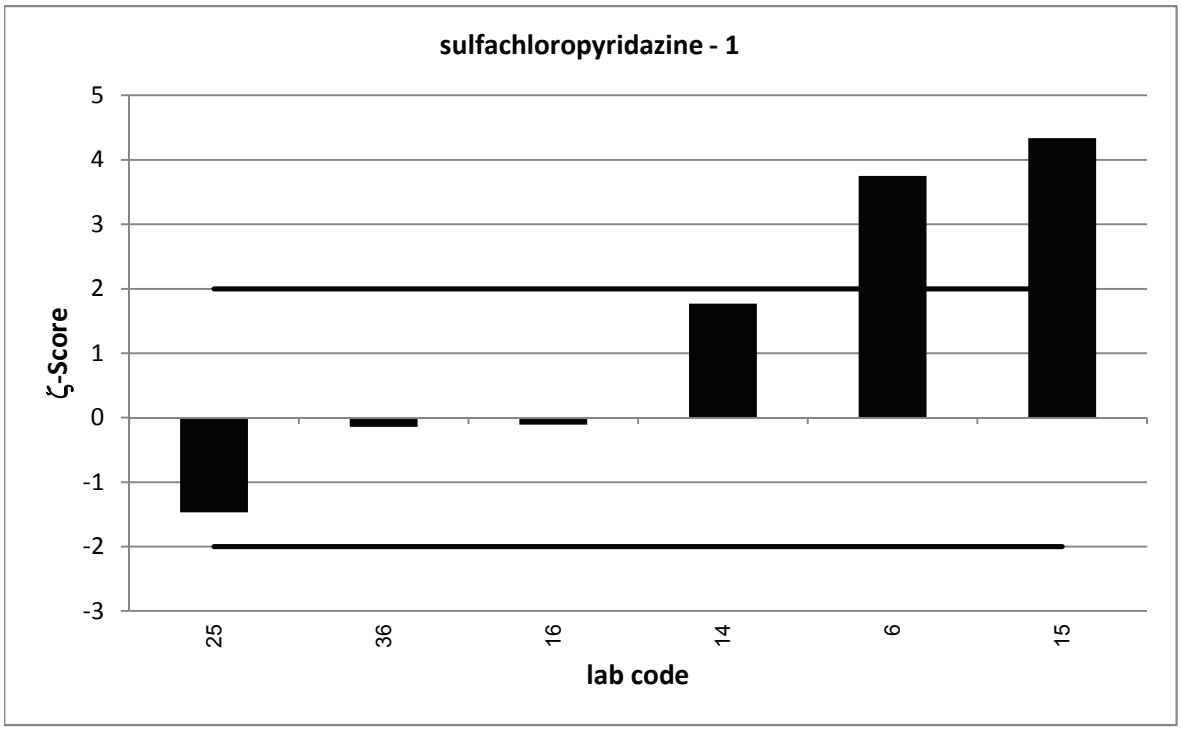
| PT 5/16 - TW S2 | | sulfachloropyridazine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,1141 | ± 0,0023 | | |
| upper tolerance limit [µg/l] | | 0,1746 | | | |
| lower tolerance limit [µg/l] | | 0,0656 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,709 | | | 19,7 | u |
| 5 | 0,0985 | | | -0,6 | s |
| 6 | 0,15 | 0,019 | 3,8 | 1,2 | s |
| 9 | 0,18 | | | 2,2 | q |
| 10 | 0,098 | | | -0,7 | s |
| 14 | 0,146 | 0,036 | 1,8 | 1,1 | s |
| 15 | 0,147 | 0,015 | 4,3 | 1,1 | s |
| 16 | 0,113 | 0,02 | -0,1 | 0,0 | s |
| 17 | 0,101 | | | -0,5 | s |
| 19 | 0,117 | | | 0,1 | s |
| 23 | 0,126 | | | 0,4 | s |
| 25 | 0,0994 | 0,02 | -1,5 | -0,6 | s |
| 26 | 0,109 | | | -0,2 | s |
| 29 | 0,1 | | | -0,6 | s |
| 36 | 0,113 | 0,015 | -0,1 | 0,0 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfachloropyridazine - 1
concentration in µg/l
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
10
5
25
29
17
26
16
36
19
23
14
15
6
9
3
lab code


sulfachloropyridazine - 1
$z_U$-score
25
20
15
10
5
0
-5
10
5
25
29
17
26
16
36
19
23
14
15
6
9
3
lab code

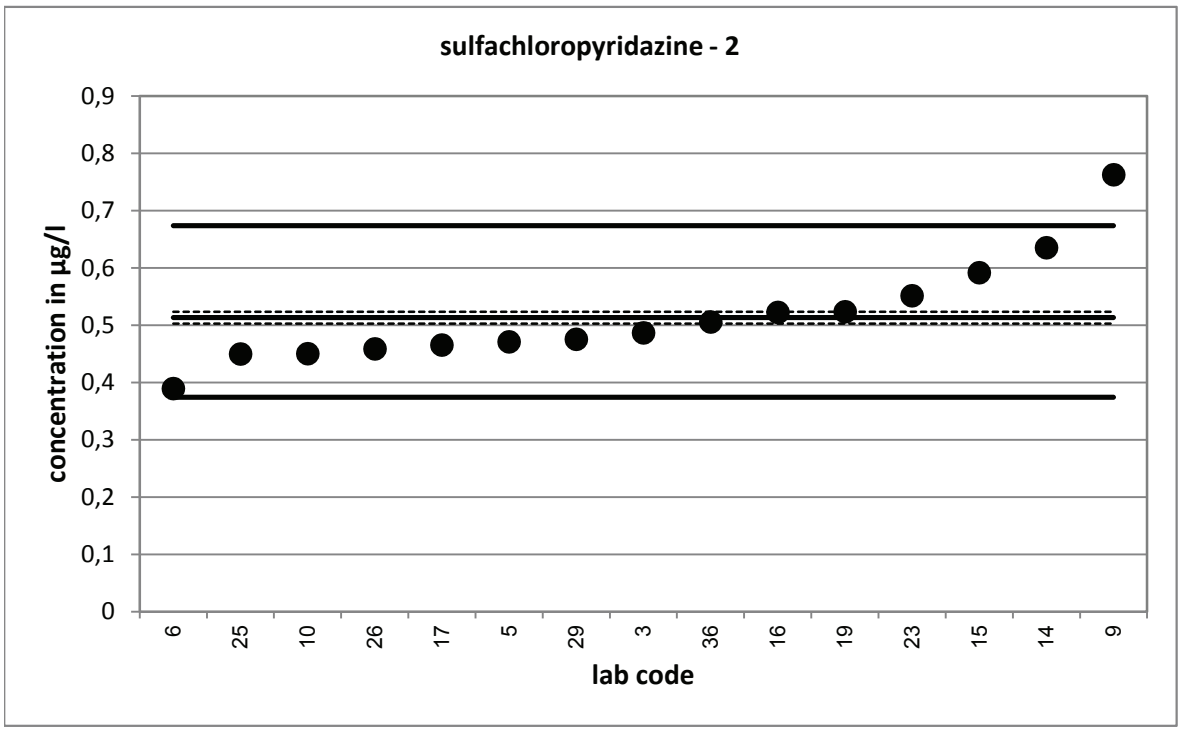

sulfachloropyridazine - 1
expanded uncertainty in µg/l
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
15
36
6
25
16
14
lab code

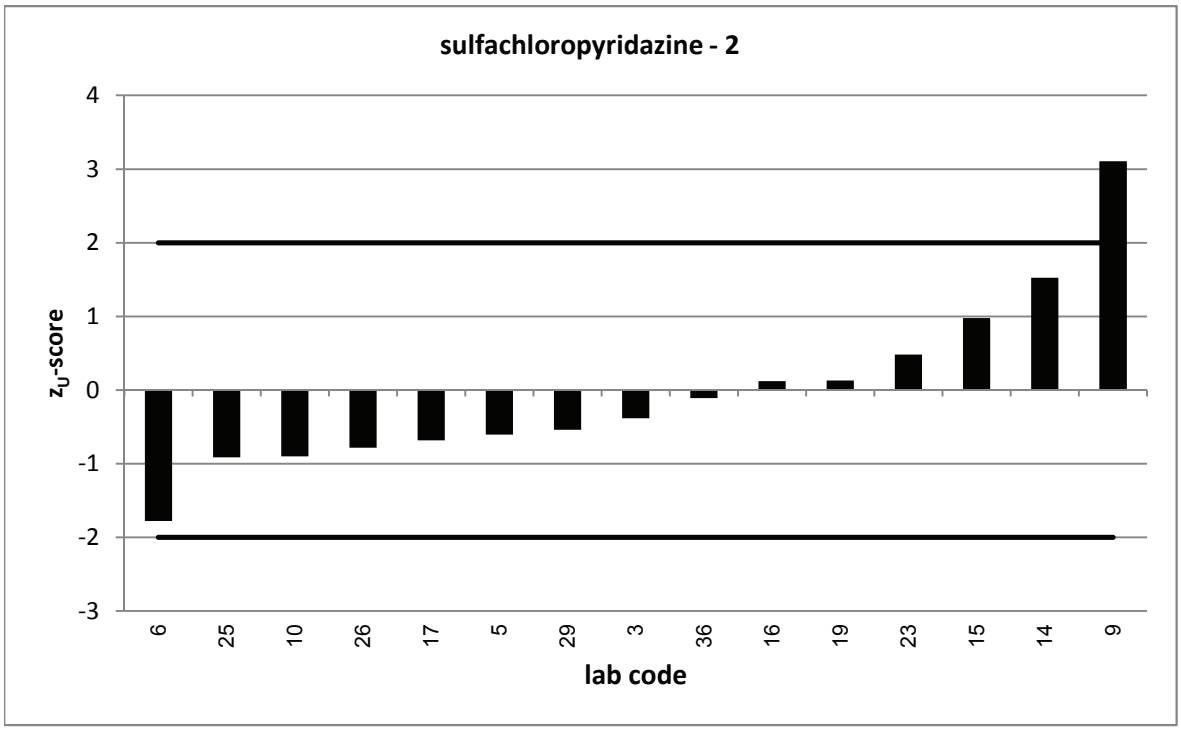

sulfachloropyridazine - 1
ζ-Score
5
4
3
2
1
0
-1
-2
-3
25
36
16
14
6
15
lab code

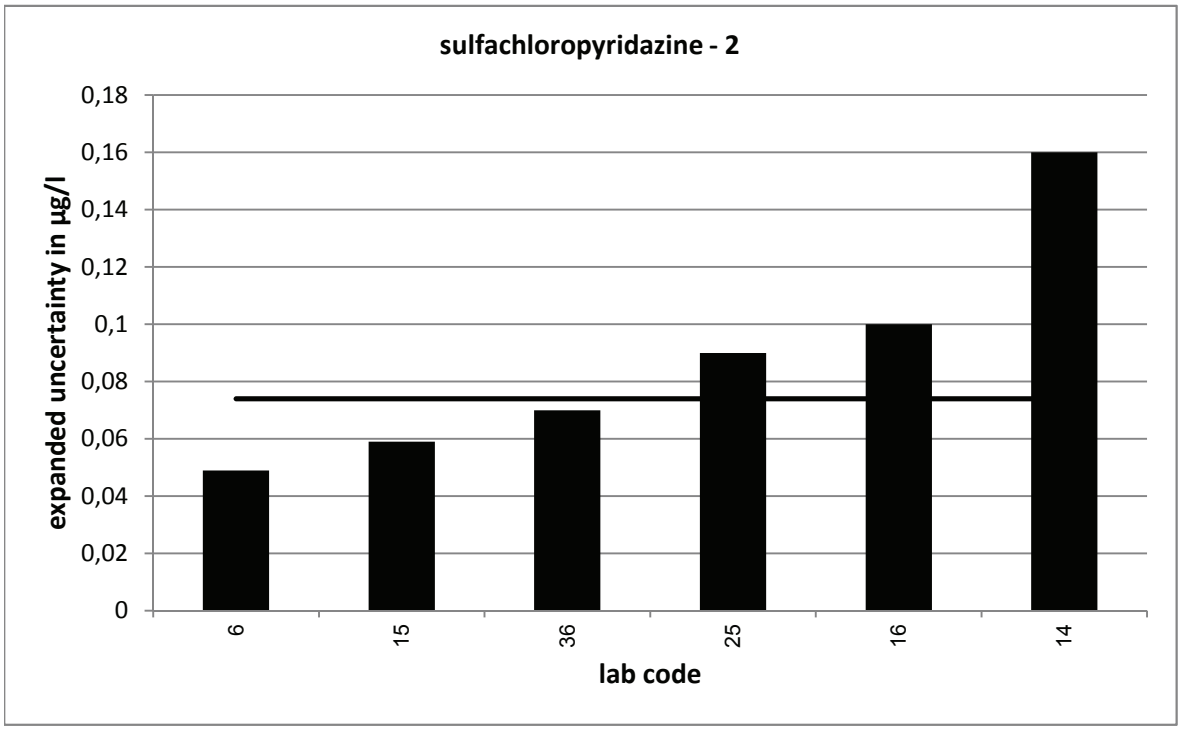
| PT 5/16 - TW S2 | | sulfachloropyridazine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,5134 | ± 0,0104 | | |
| upper tolerance limit [µg/l] | | 0,6741 | | | |
| lower tolerance limit [µg/l] | | 0,3746 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,487 | | | -0,4 | s |
| 5 | 0,4715 | | | -0,6 | s |
| 6 | 0,39 | 0,049 | -4,9 | -1,8 | s |
| 9 | 0,763 | | | 3,1 | u |
| 10 | 0,451 | | | -0,9 | s |
| 14 | 0,636 | 0,16 | 1,5 | 1,5 | s |
| 15 | 0,592 | 0,059 | 2,6 | 1,0 | s |
| 16 | 0,523 | 0,1 | 0,2 | 0,1 | s |
| 17 | 0,466 | | | -0,7 | s |
| 19 | 0,524 | | | 0,1 | s |
| 23 | 0,552 | | | 0,5 | s |
| 25 | 0,45 | 0,09 | -1,4 | -0,9 | s |
| 26 | 0,459 | | | -0,8 | s |
| 29 | 0,476 | | | -0,5 | s |
| 36 | 0,506 | 0,07 | -0,2 | -0,1 | s |

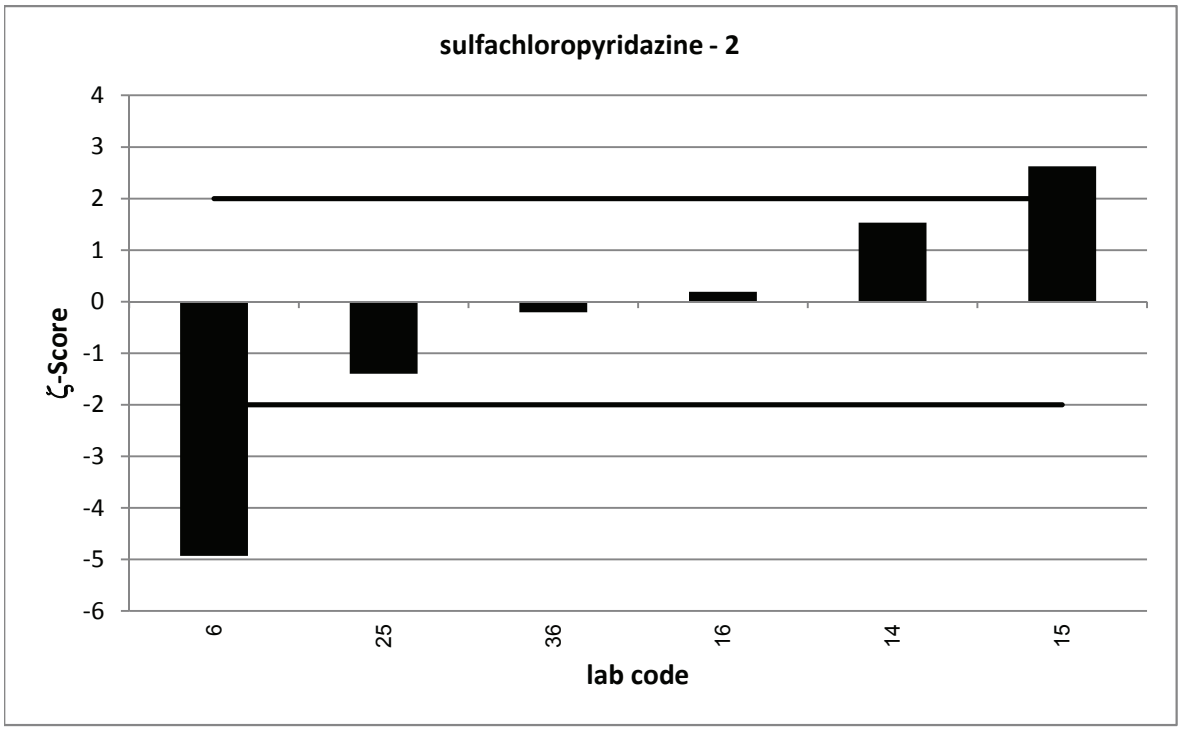
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfachloropyridazine - 2
concentration in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
6
25
10
26
17
5
29
3
36
16
19
23
15
14
9
lab code

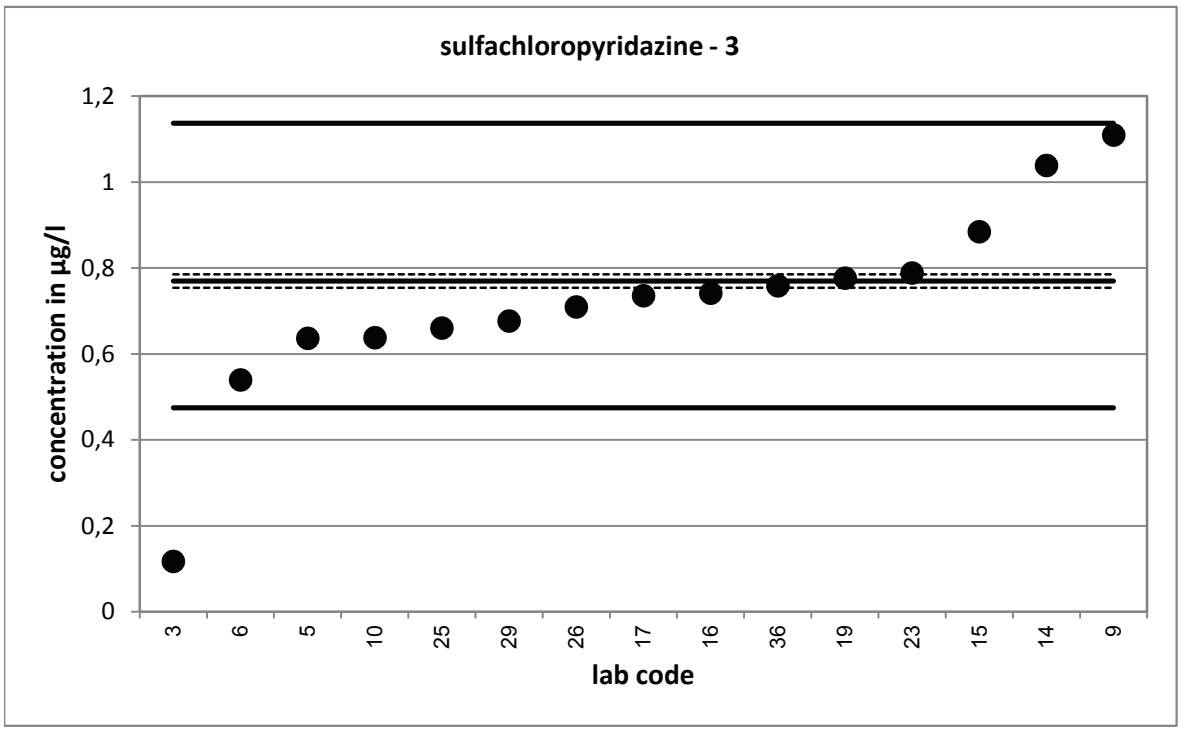

sulfachloropyridazine - 2
$z_U$-score
4
3
2
1
0
-1
-2
-3
6
25
10
26
17
5
29
3
36
16
19
23
15
14
9
lab code

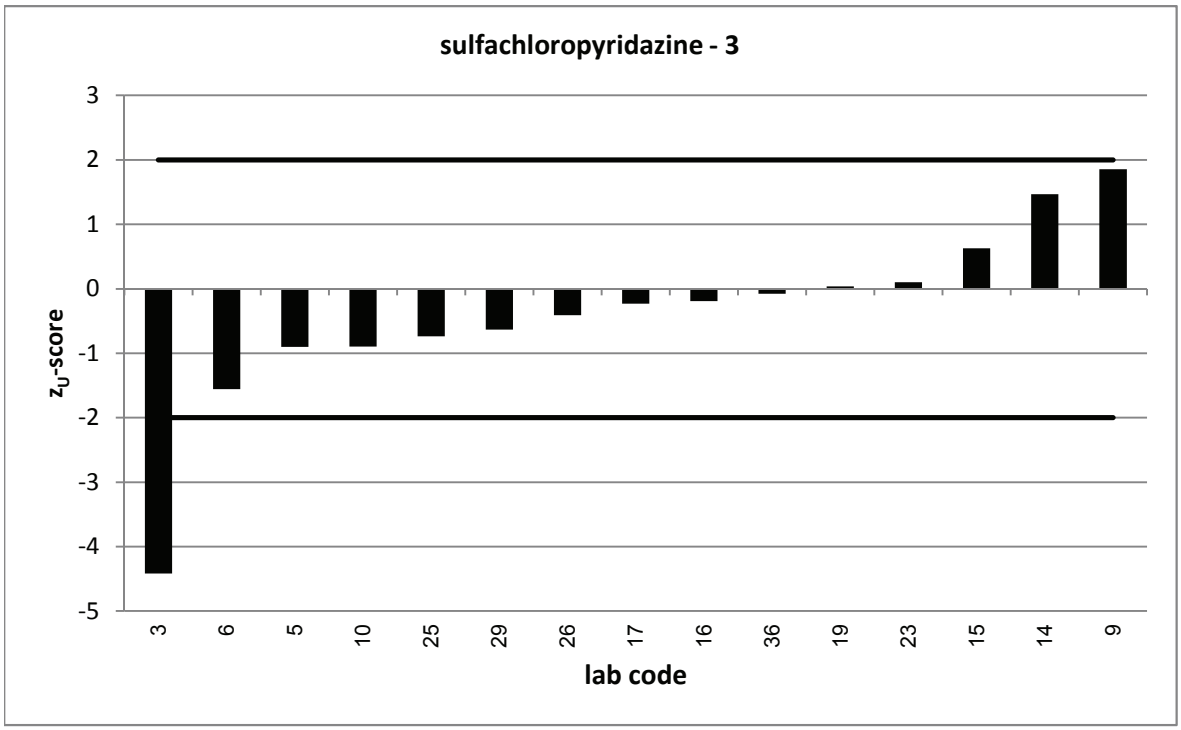

sulfachloropyridazine - 2
expanded uncertainty in µg/l
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
6
15
36
25
16
14
lab code

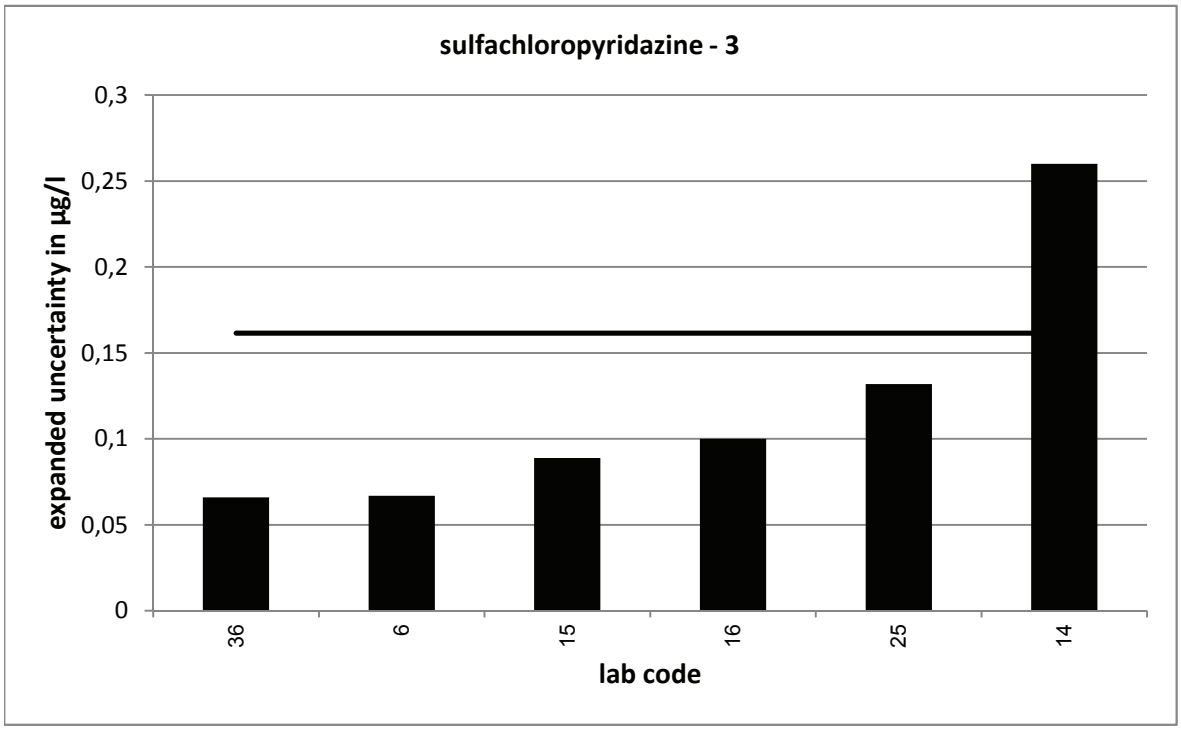

sulfachloropyridazine - 2
ζ-Score
4
3
2
1
0
-1
-2
-3
-4
-5
-6
6
25
36
16
14
15
lab code

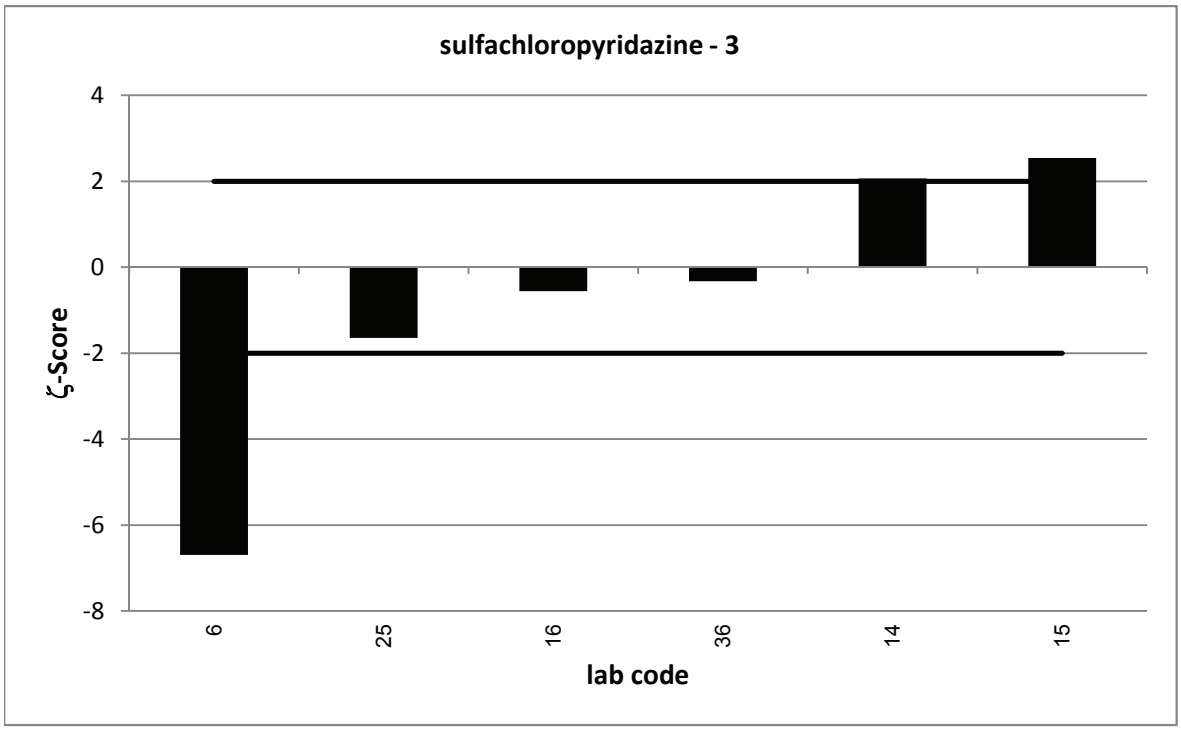
| PT 5/16 - TW S2 | | sulfachloropyridazine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,7701 | ± 0,0156 | | |
| upper tolerance limit [µg/l] | | 1,137 | | | |
| lower tolerance limit [µg/l] | | 0,4748 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 3 | 0,118 | | | -4,4 | u |
| 5 | 0,6369 | | | -0,9 | s |
| 6 | 0,54 | 0,067 | -6,7 | -1,6 | s |
| 9 | 1,11 | | | 1,9 | s |
| 10 | 0,638 | | | -0,9 | s |
| 14 | 1,039 | 0,26 | 2,1 | 1,5 | s |
| 15 | 0,885 | 0,089 | 2,5 | 0,6 | s |
| 16 | 0,742 | 0,1 | -0,6 | -0,2 | s |
| 17 | 0,736 | | | -0,2 | s |
| 19 | 0,777 | | | 0,0 | s |
| 23 | 0,789 | | | 0,1 | s |
| 25 | 0,661 | 0,132 | -1,6 | -0,7 | s |
| 26 | 0,71 | | | -0,4 | s |
| 29 | 0,677 | | | -0,6 | s |
| 36 | 0,759 | 0,066 | -0,3 | -0,1 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%
** s = satisfactory, q = questionable, u = unsatisfactory


sulfachloropyridazine - 3
concentration in µg/l
1,2
1
0,8
0,6
0,4
0,2
0
3
6
5
10
25
29
26
17
16
36
19
23
15
14
9
lab code


sulfachloropyridazine - 3
$z_U$-score
3
2
1
0
-1
-2
-3
-4
-5
3
6
5
10
25
29
26
17
16
36
19
23
15
14
9
lab code

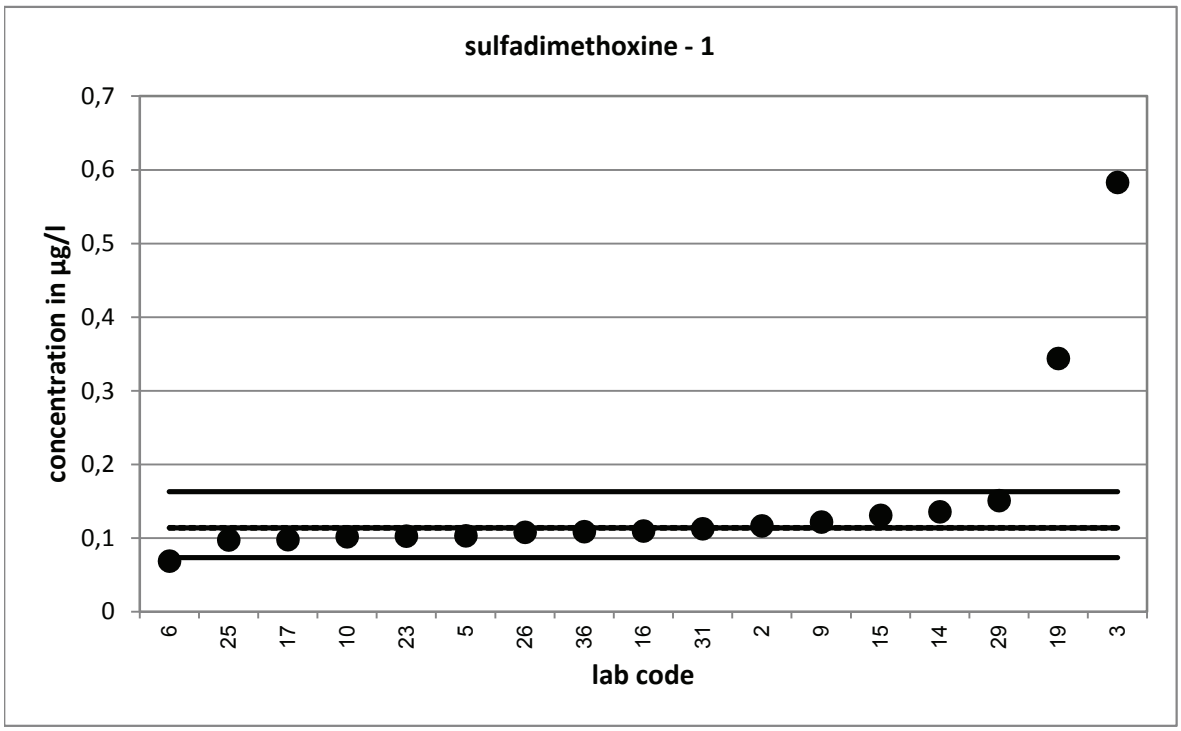

sulfachloropyridazine - 3
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
36
6
15
16
25
14
lab code


sulfachloropyridazine - 3
ζ-Score
4
2
0
-2
-4
-6
-8
6
25
16
36
14
15
lab code

| PT 5/16 - TW S2 | | sulfadimethoxine - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | | 0,1139 | ± 0,0021 | |
| upper tolerance limit [µg/l] | | | 0,1629 | | |
| lower tolerance limit [µg/l] | | | 0,07365 | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,117 | | | 0,1 | s |
| 3 | 0,583 | | | 19,1 | u |
| 5 | 0,1032 | | | -0,5 | s |
| 6 | 0,069 | 0,012 | -7,4 | -2,2 | q |
| 9 | 0,122 | | | 0,3 | s |
| 10 | 0,102 | | | -0,6 | s |
| 14 | 0,136 | 0,034 | 1,3 | 0,9 | s |
| 15 | 0,131 | 0,02 | 1,7 | 0,7 | s |
| 16 | 0,11 | 0,02 | -0,4 | -0,2 | s |
| 17 | 0,098 | | | -0,8 | s |
| 19 | 0,344 | | | 9,4 | u |
| 23 | 0,103 | | | -0,5 | s |
| 25 | 0,0977 | 0,02 | -1,7 | -0,8 | s |
| 26 | 0,108 | | | -0,3 | s |
| 29 | 0,151 | | | 1,5 | s |
| 31 | 0,113 | | | 0,0 | s |
| 36 | 0,109 | 0,01 | -1,0 | -0,2 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadimethoxine - 1
concentration in µg/l
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
6
25
17
10
23
5
26
36
16
31
2
9
15
14
29
19
3
lab code


sulfadimethoxine - 1
$z_U$-score
25
20
15
10
5
0
-5
6
25
17
10
23
5
26
36
16
31
2
9
15
14
29
19
3
lab code

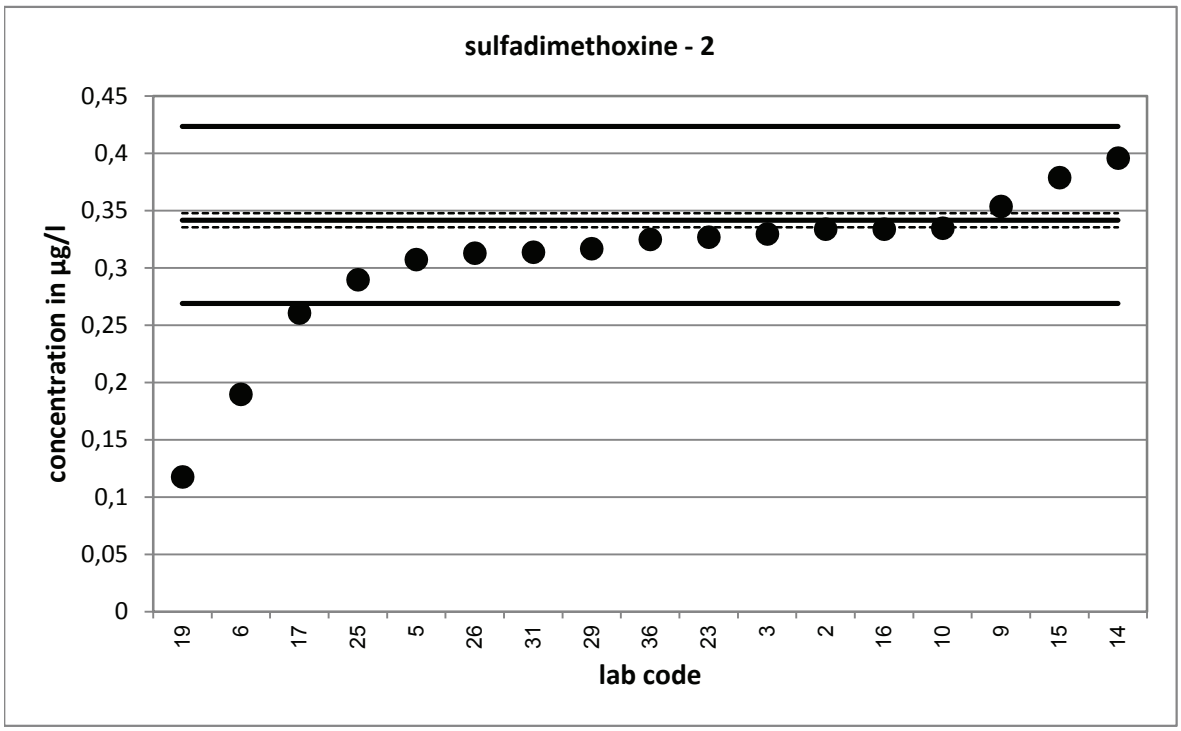

sulfadimethoxine - 1
expanded uncertainty in µg/l
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
36
6
25
15
16
14
lab code

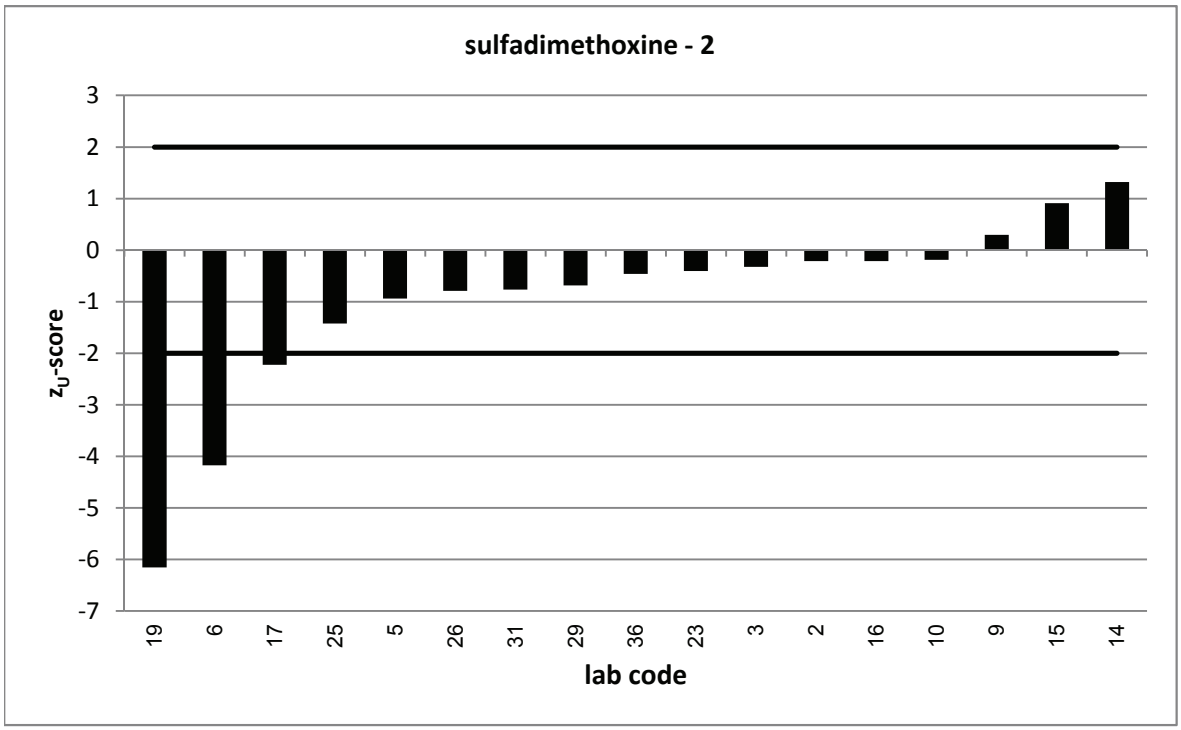

sulfadimethoxine - 1
ζ-Score
4
2
0
-2
-4
-6
-8
6
25
36
16
14
15
lab code

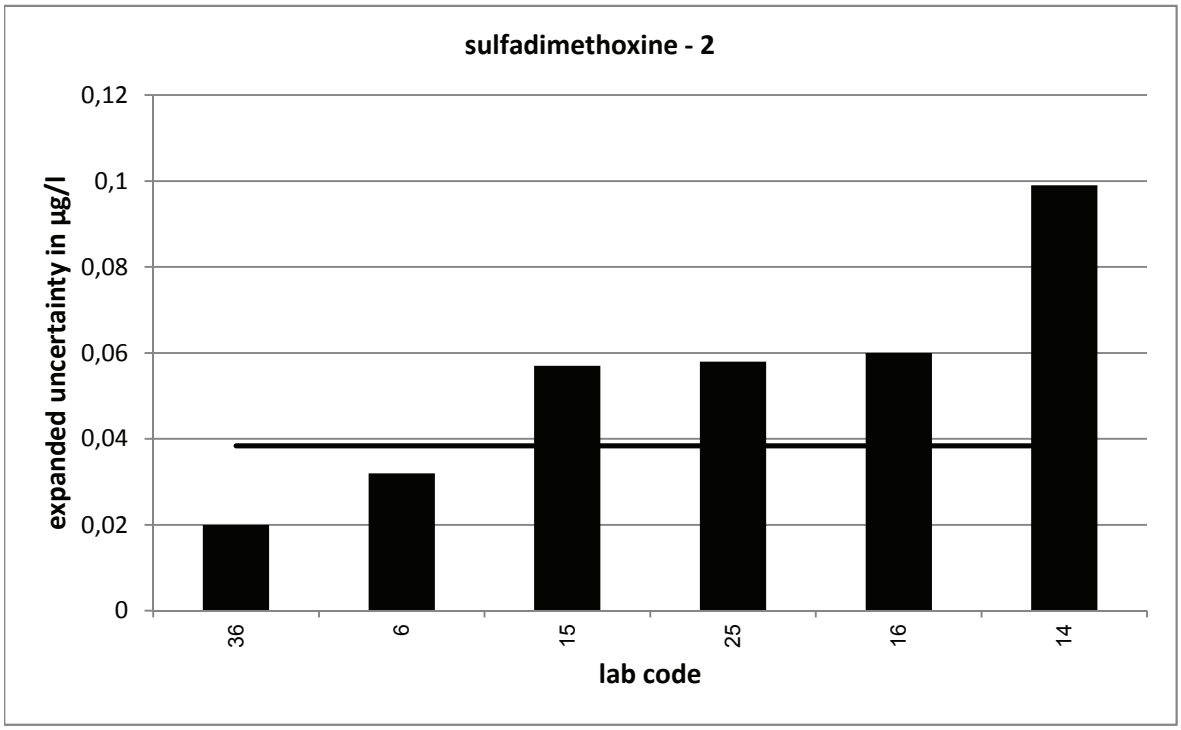
| PT 5/16 - TW S2 | | sulfadimethoxine - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,3418 | ± 0,0062 | | |
| upper tolerance limit [µg/l] | | 0,4237 | | | |
| lower tolerance limit [µg/l] | | 0,269 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,334 | | | -0,2 | s |
| 3 | 0,33 | | | -0,3 | s |
| 5 | 0,3076 | | | -0,9 | s |
| 6 | 0,19 | 0,032 | -9,3 | -4,2 | u |
| 9 | 0,354 | | | 0,3 | s |
| 10 | 0,335 | | | -0,2 | s |
| 14 | 0,396 | 0,099 | 1,1 | 1,3 | s |
| 15 | 0,379 | 0,057 | 1,3 | 0,9 | s |
| 16 | 0,334 | 0,06 | -0,3 | -0,2 | s |
| 17 | 0,261 | | | -2,2 | q |
| 19 | 0,118 | | | -6,2 | u |
| 23 | 0,327 | | | -0,4 | s |
| 25 | 0,29 | 0,058 | -1,8 | -1,4 | s |
| 26 | 0,313 | | | -0,8 | s |
| 29 | 0,317 | | | -0,7 | s |
| 31 | 0,314 | | | -0,8 | s |
| 36 | 0,325 | 0,02 | -1,6 | -0,5 | s |

* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadimethoxine - 2
concentration in µg/l
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
19
6
17
25
5
26
31
29
36
23
3
2
16
10
9
15
14
lab code


sulfadimethoxine - 2
$z_U$-score
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
19
6
17
25
5
26
31
29
36
23
3
2
16
10
9
15
14
lab code

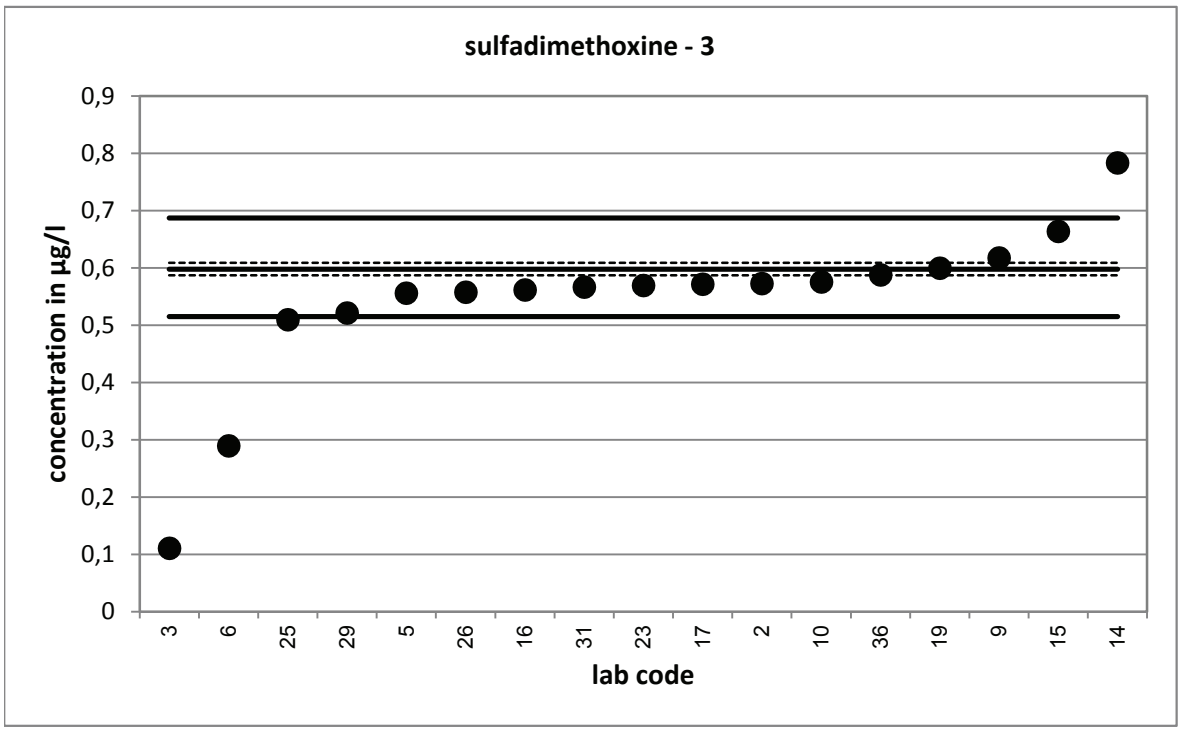

sulfadimethoxine - 2
expanded uncertainty in µg/l
0,12
0,1
0,08
0,06
0,04
0,02
0
36
6
15
25
16
14
lab code

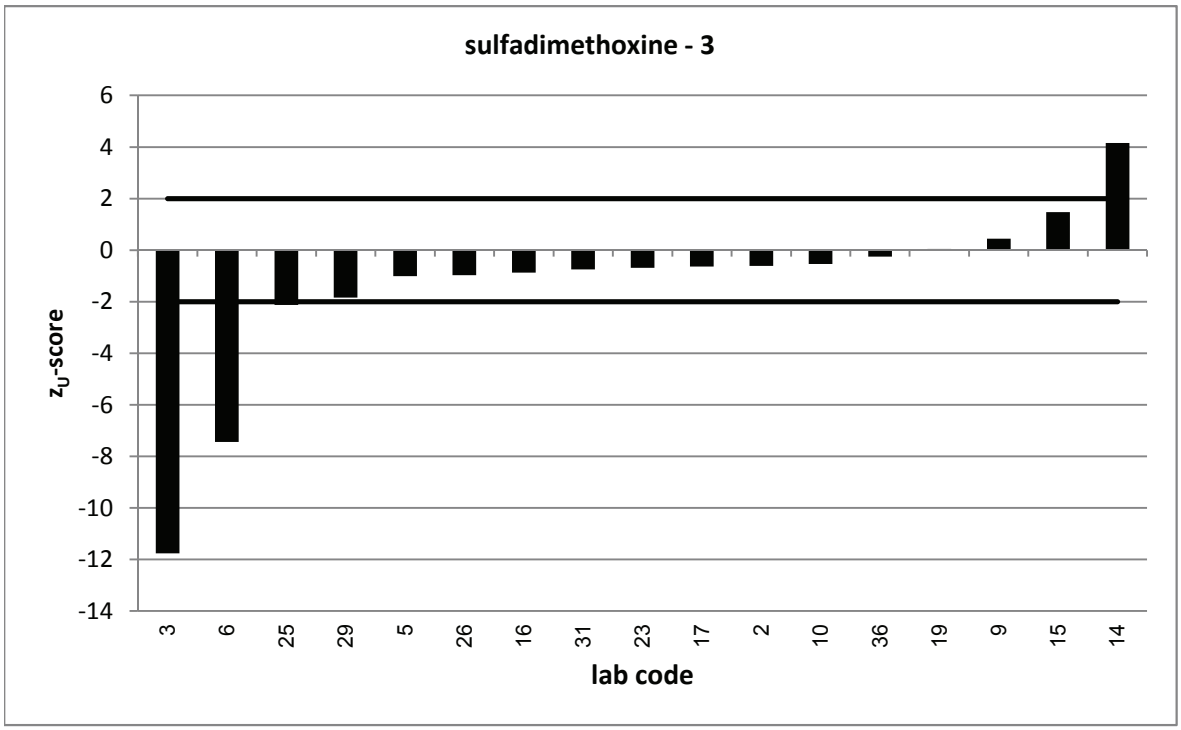

sulfadimethoxine - 2
ζ-Score
4
2
0
-2
-4
-6
-8
-10
6
25
36
16
14
15
lab code

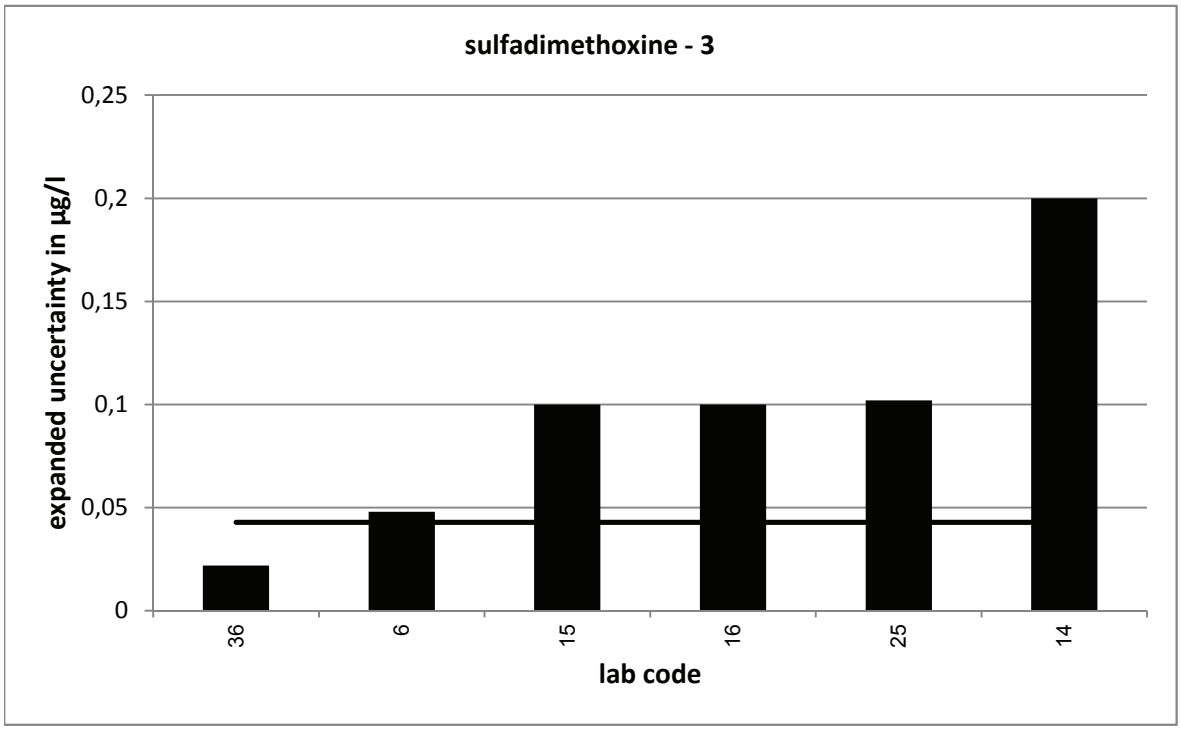
| PT 5/16 - TW S2 | | sulfadimethoxine - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | 0,5982 | ± 0,0109 | | |
| upper tolerance limit [µg/l] | | 0,6875 | | | |
| lower tolerance limit [µg/l] | | 0,5153 | | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,573 | | | -0,6 | s |
| 3 | 0,111 | | | -11,8 | u |
| 5 | 0,5562 | | | -1,0 | s |
| 6 | 0,29 | 0,048 | -12,5 | -7,4 | u |
| 9 | 0,618 | | | 0,4 | s |
| 10 | 0,576 | | | -0,5 | s |
| 14 | 0,784 | 0,2 | 1,9 | 4,2 | u |
| 15 | 0,664 | 0,1 | 1,3 | 1,5 | s |
| 16 | 0,562 | 0,1 | -0,7 | -0,9 | s |
| 17 | 0,572 | | | -0,6 | s |
| 19 | 0,6 | | | 0,0 | s |
| 23 | 0,57 | | | -0,7 | s |
| 25 | 0,51 | 0,102 | -1,7 | -2,1 | q |
| 26 | 0,558 | | | -1,0 | s |
| 29 | 0,522 | | | -1,8 | s |
| 31 | 0,567 | | | -0,8 | s |
| 36 | 0,588 | 0,022 | -0,8 | -0,2 | s |

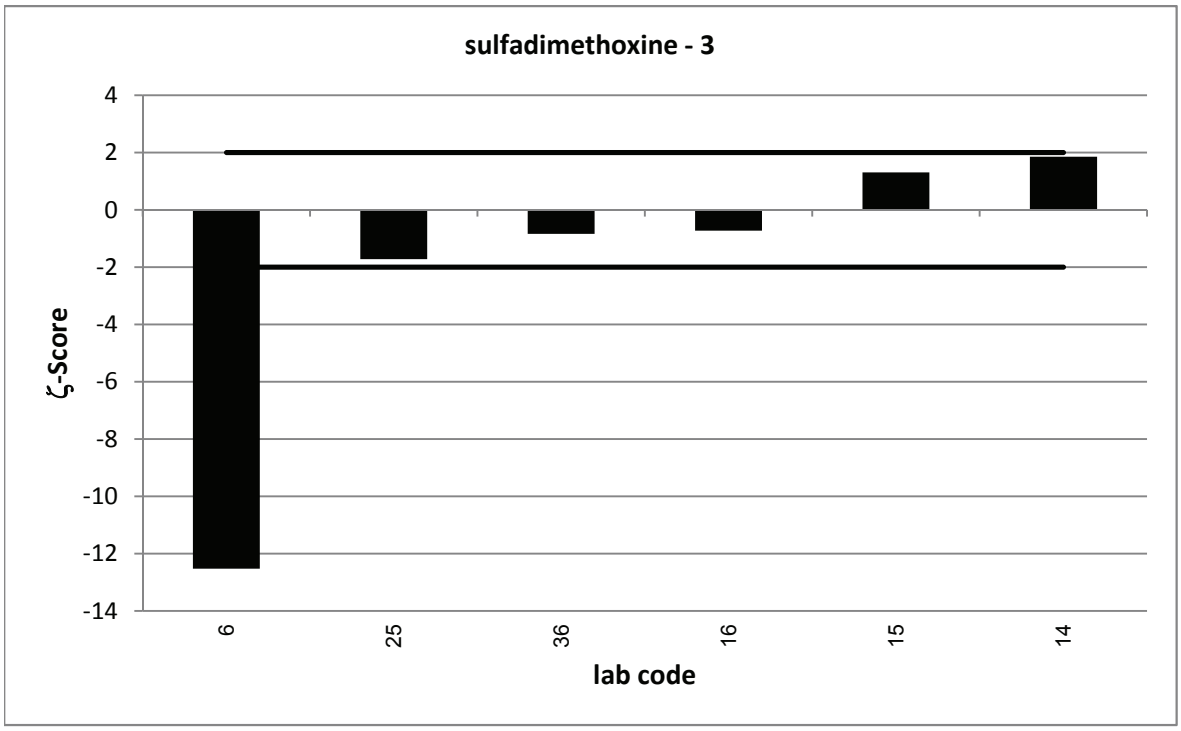
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


sulfadimethoxine - 3
concentration in µg/l
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
3
6
25
29
5
26
16
31
23
17
2
10
36
19
9
15
14
lab code


sulfadimethoxine - 3
$z_U$-score
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
3
6
25
29
5
26
16
31
23
17
2
10
36
19
9
15
14
lab code

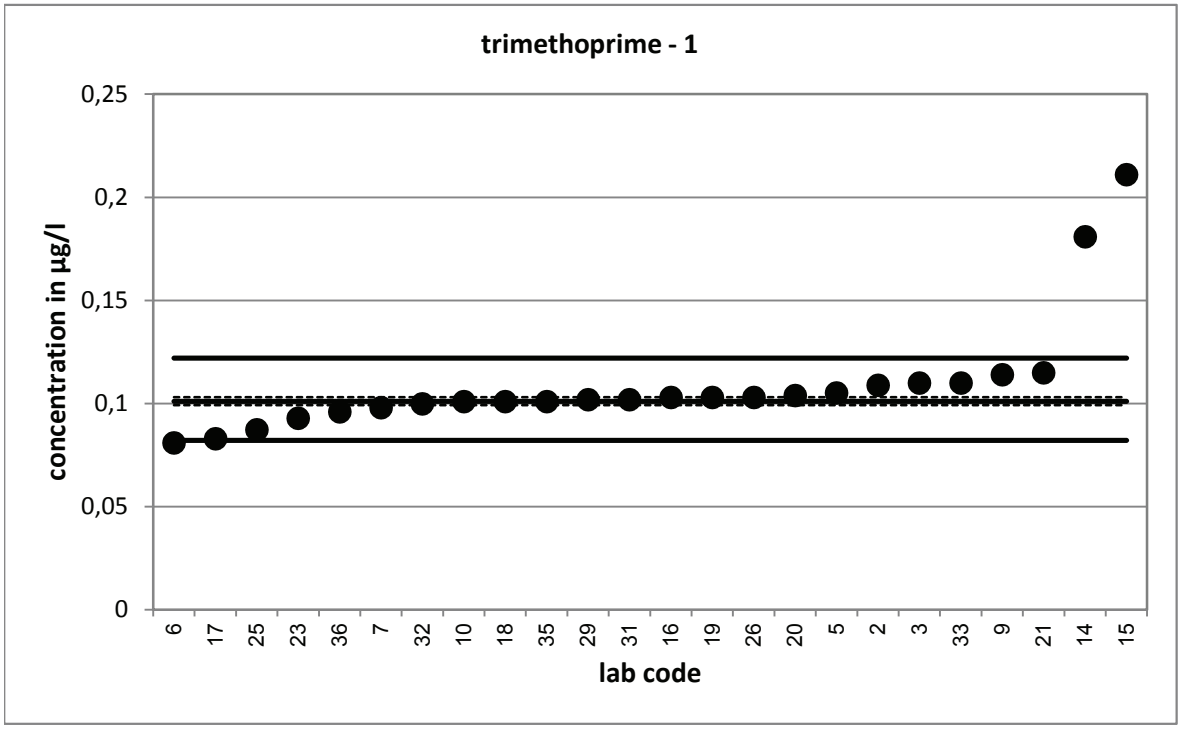

sulfadimethoxine - 3
expanded uncertainty in µg/l
0,25
0,2
0,15
0,1
0,05
0
36
6
15
16
25
14
lab code

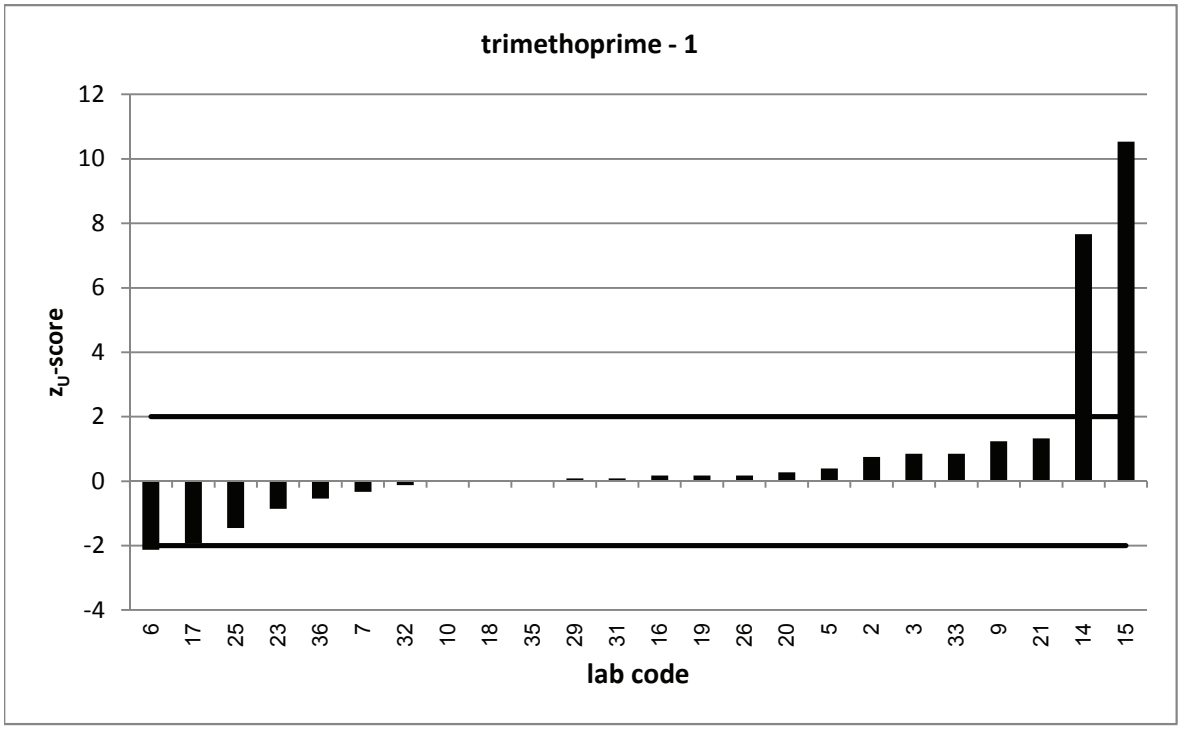

sulfadimethoxine - 3
ζ-Score
4
2
0
-2
-4
-6
-8
-10
-12
-14
6
25
36
16
15
14
lab code

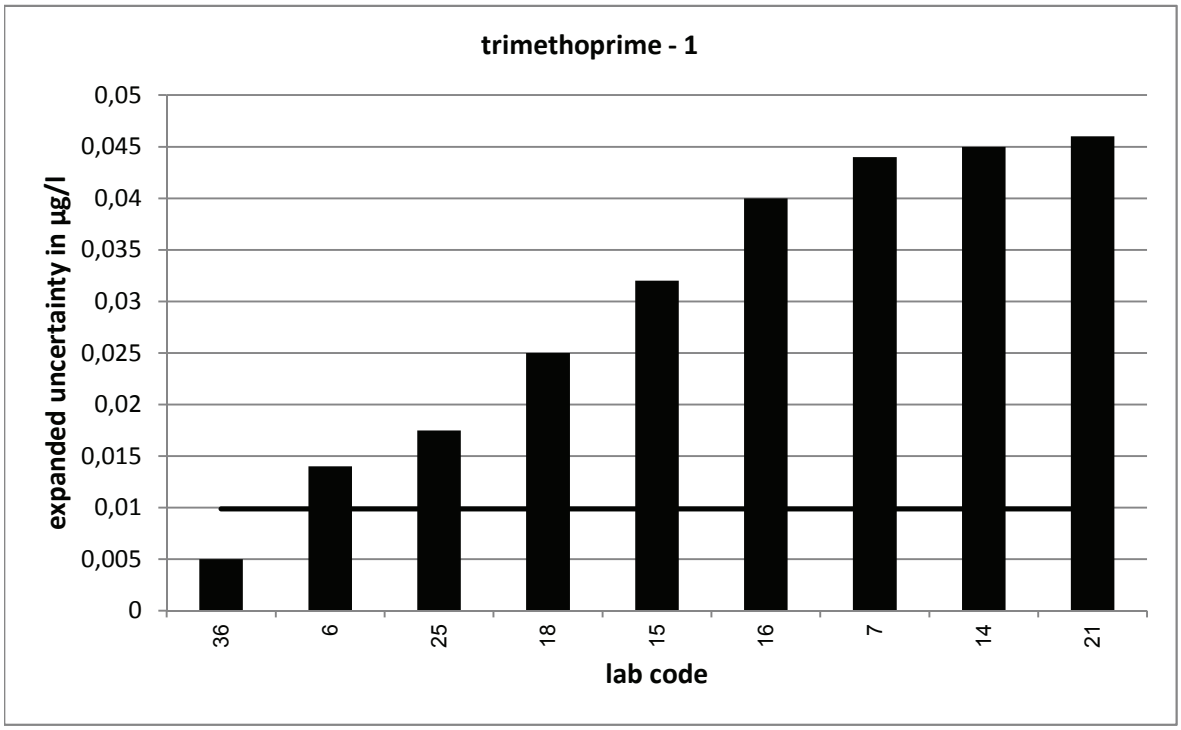
| PT 5/16 - TW S2 | | trimethoprime - 1 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | | 0,1011 | ± 0,0019 | |
| upper tolerance limit [µg/l] | | | 0,122 | | |
| lower tolerance limit [µg/l] | | | 0,08222 | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,109 | | | 0,8 | s |
| 3 | 0,11 | | | 0,9 | s |
| 5 | 0,1052 | | | 0,4 | s |
| 6 | 0,081 | 0,014 | -2,9 | -2,1 | q |
| 7 | 0,098 | 0,044 | -0,1 | -0,3 | s |
| 9 | 0,114 | | | 1,2 | s |
| 10 | 0,101 | | | 0,0 | s |
| 14 | 0,181 | 0,045 | 3,5 | 7,7 | u |
| 15 | 0,211 | 0,032 | 6,9 | 10,5 | u |
| 16 | 0,103 | 0,04 | 0,1 | 0,2 | s |
| 17 | 0,083 | | | -1,9 | s |
| 18 | 0,101 | 0,025 | 0,0 | 0,0 | s |
| 19 | 0,103 | | | 0,2 | s |
| 20 | 0,104 | | | 0,3 | s |
| 21 | 0,115 | 0,046 | 0,6 | 1,3 | s |
| 23 | 0,093 | | | -0,9 | s |
| 25 | 0,0874 | 0,018 | -1,6 | -1,5 | s |
| 26 | 0,103 | | | 0,2 | s |
| 29 | 0,102 | | | 0,1 | s |
| 31 | 0,102 | | | 0,1 | s |
| 32 | 0,1 | | | -0,1 | s |
| 33 | 0,11 | | | 0,9 | s |
| 35 | 0,101 | | | 0,0 | s |
| 36 | 0,096 | 0,005 | -1,9 | -0,5 | s |

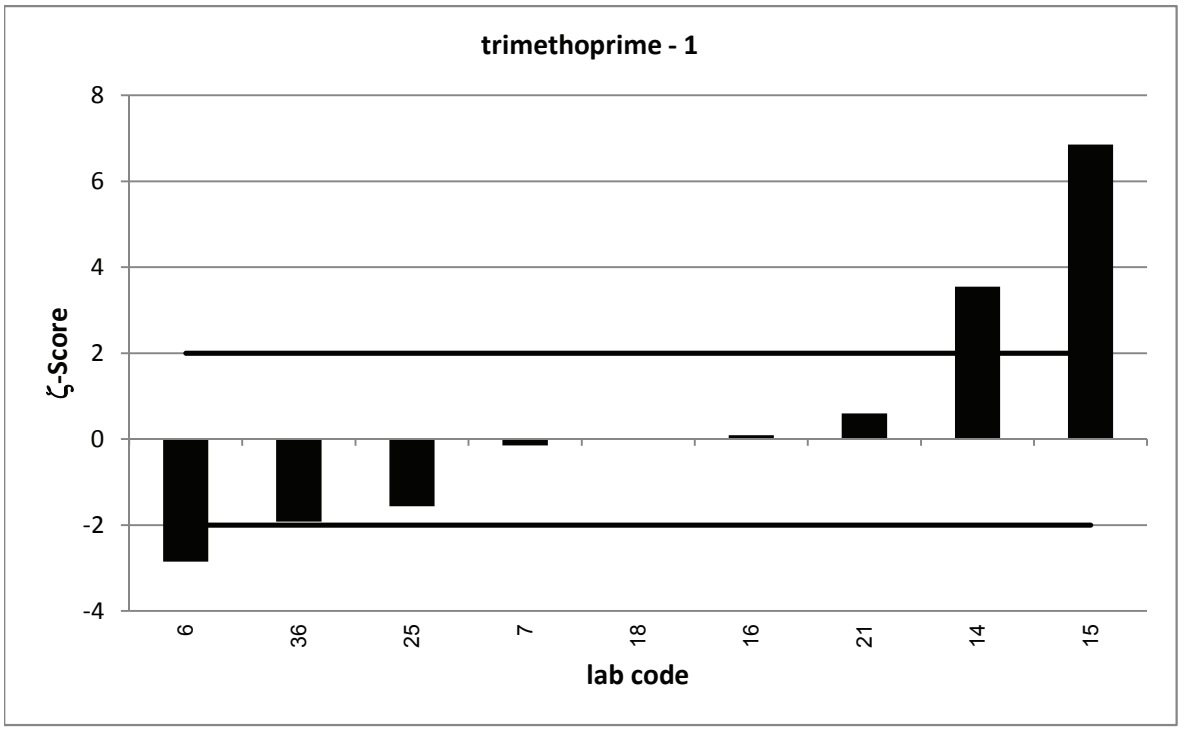
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


trimethoprime - 1
concentration in µg/l
0,25
0,2
0,15
0,1
0,05
0
6 17 25 23 36 7 32 10 18 35 29 31 16 19 26 20 5 2 3 33 9 21 14 15
lab code


trimethoprime - 1
$z_U$-score
12
10
8
6
4
2
0
-2
-4
6 17 25 23 36 7 32 10 18 35 29 31 16 19 26 20 5 2 3 33 9 21 14 15
lab code

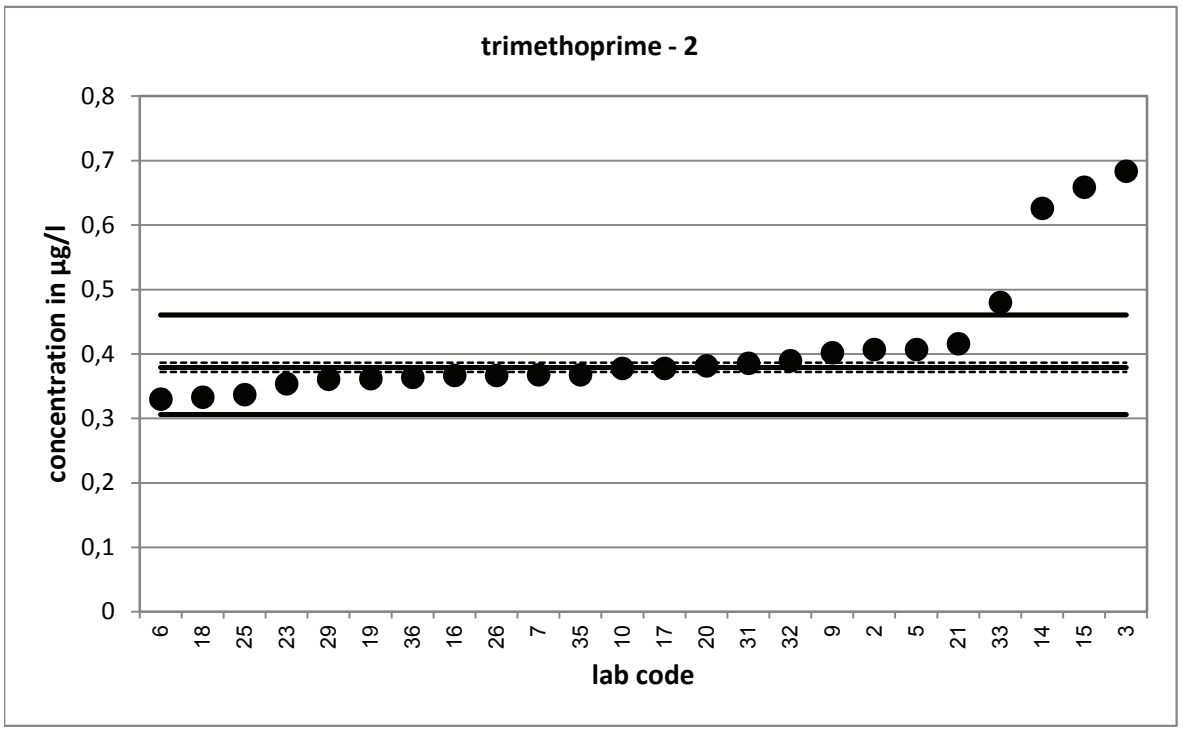

trimethoprime - 1
expanded uncertainty in µg/l
0,05
0,045
0,04
0,035
0,03
0,025
0,02
0,015
0,01
0,005
0
36
6
25
18
15
16
7
14
21
lab code

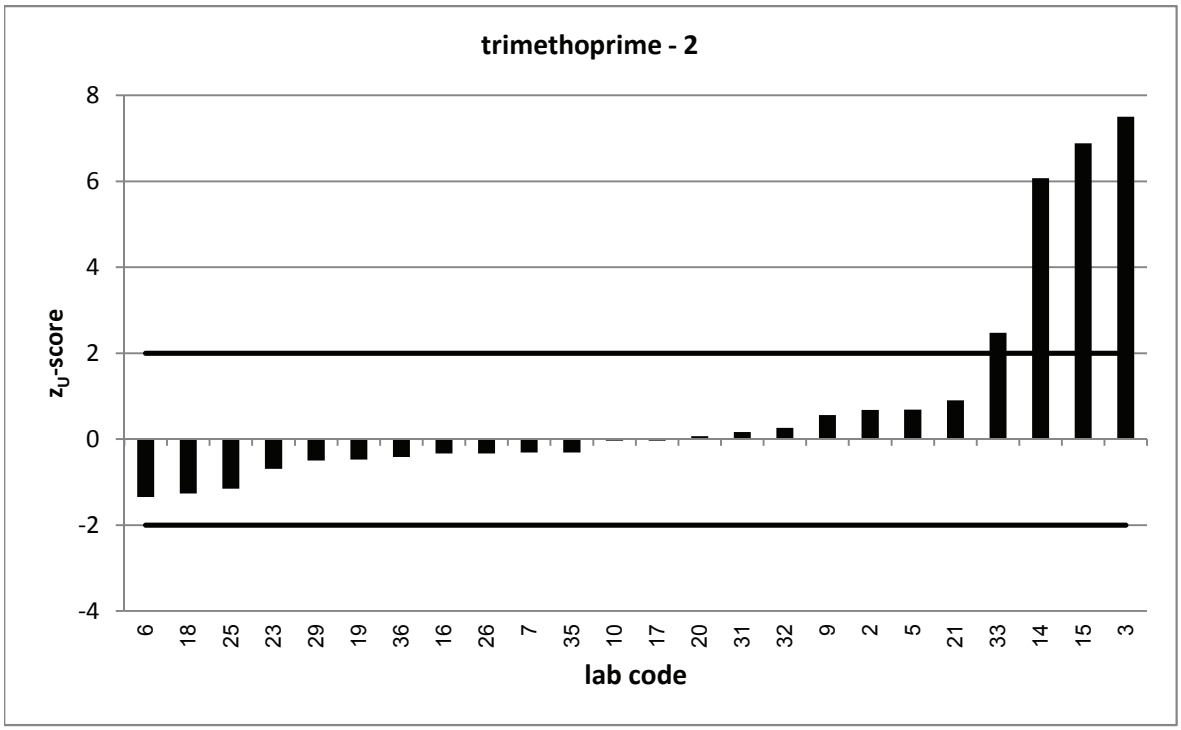

trimethoprime - 1
ζ-Score
8
6
4
2
0
-2
-4
6
36
25
7
18
16
21
14
15
lab code

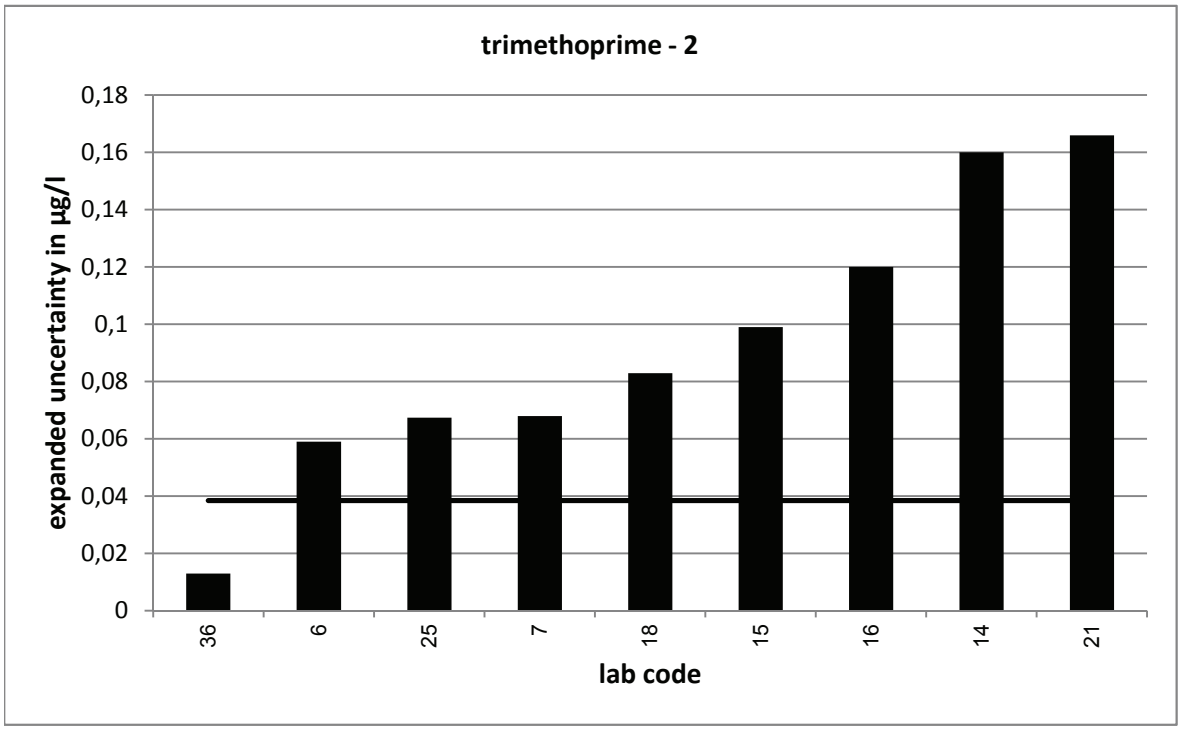
| PT 5/16 - TW S2 | | trimethoprime - 2 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | | 0,3793 | ± 0,0071 | |
| upper tolerance limit [µg/l] | | | 0,4605 | | |
| lower tolerance limit [µg/l] | | | 0,3059 | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,407 | | | 0,7 | s |
| 3 | 0,684 | | | 7,5 | u |
| 5 | 0,4073 | | | 0,7 | s |
| 6 | 0,33 | 0,059 | -1,7 | -1,3 | s |
| 7 | 0,368 | 0,068 | -0,3 | -0,3 | s |
| 9 | 0,402 | | | 0,6 | s |
| 10 | 0,378 | | | 0,0 | s |
| 14 | 0,626 | 0,16 | 3,1 | 6,1 | u |
| 15 | 0,659 | 0,099 | 5,6 | 6,9 | u |
| 16 | 0,367 | 0,12 | -0,2 | -0,3 | s |
| 17 | 0,378 | | | 0,0 | s |
| 18 | 0,333 | 0,083 | -1,1 | -1,3 | s |
| 19 | 0,362 | | | -0,5 | s |
| 20 | 0,382 | | | 0,1 | s |
| 21 | 0,416 | 0,166 | 0,4 | 0,9 | s |
| 23 | 0,354 | | | -0,7 | s |
| 25 | 0,337 | 0,067 | -1,2 | -1,2 | s |
| 26 | 0,367 | | | -0,3 | s |
| 29 | 0,361 | | | -0,5 | s |
| 31 | 0,386 | | | 0,2 | s |
| 32 | 0,39 | | | 0,3 | s |
| 33 | 0,48 | | | 2,5 | q |
| 35 | 0,368 | | | -0,3 | s |
| 36 | 0,364 | 0,013 | -2,1 | -0,4 | s |

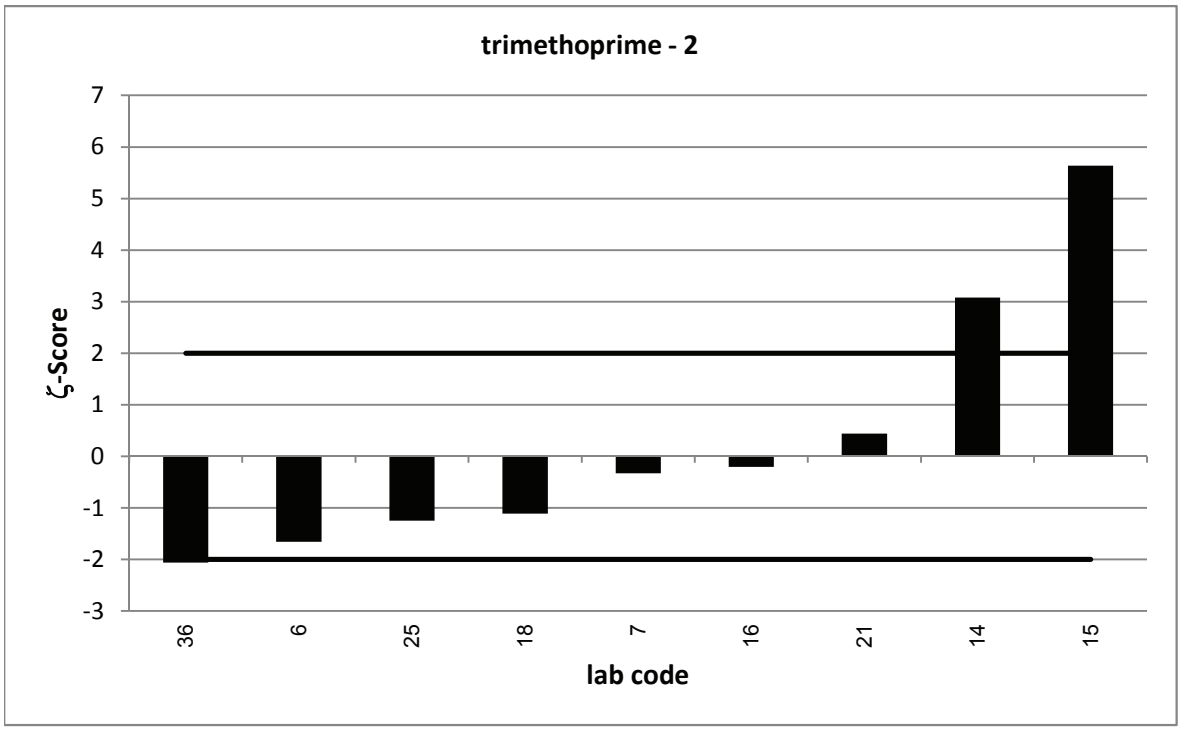
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


trimethoprime - 2
concentration in µg/l
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
6 18 25 23 29 19 36 16 26 7 35 10 17 20 31 32 9 2 5 21 33 14 15 3
lab code


trimethoprime - 2
$z_U$-score
8
6
4
2
0
-2
-4
6 18 25 23 29 19 36 16 26 7 35 10 17 20 31 32 9 2 5 21 33 14 15 3
lab code

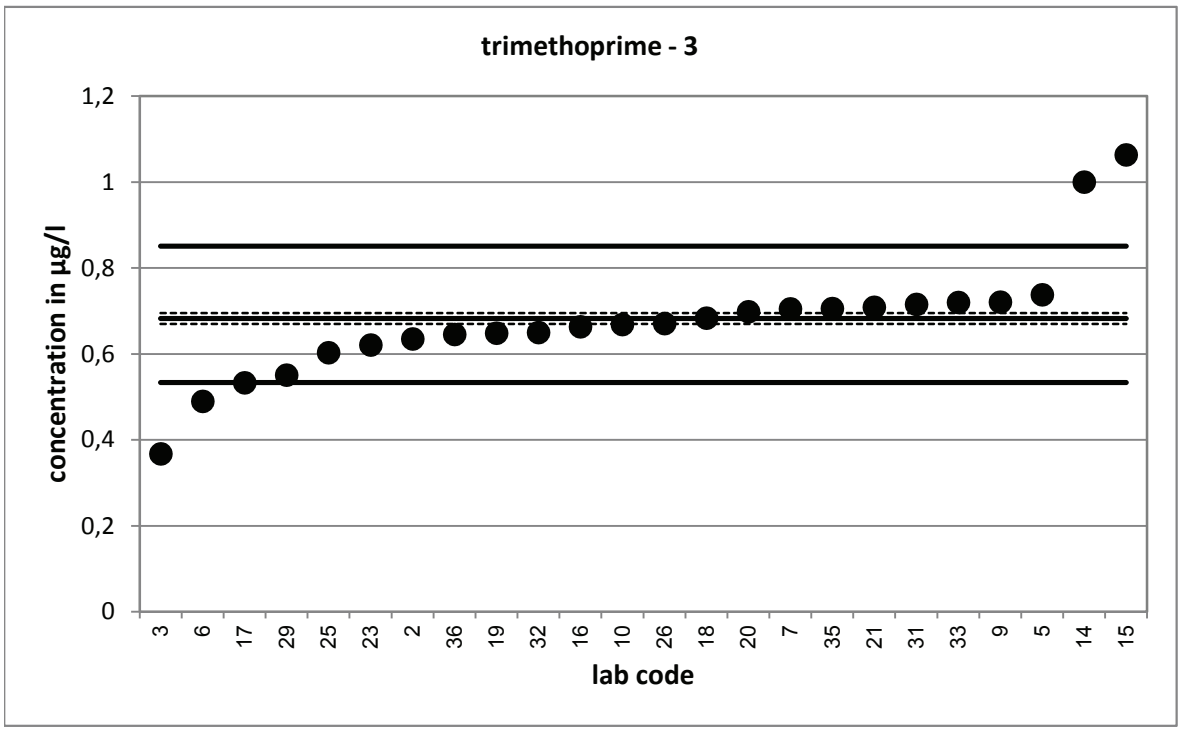

trimethoprime - 2
expanded uncertainty in µg/l
0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
36
6
25
7
18
15
16
14
21
lab code

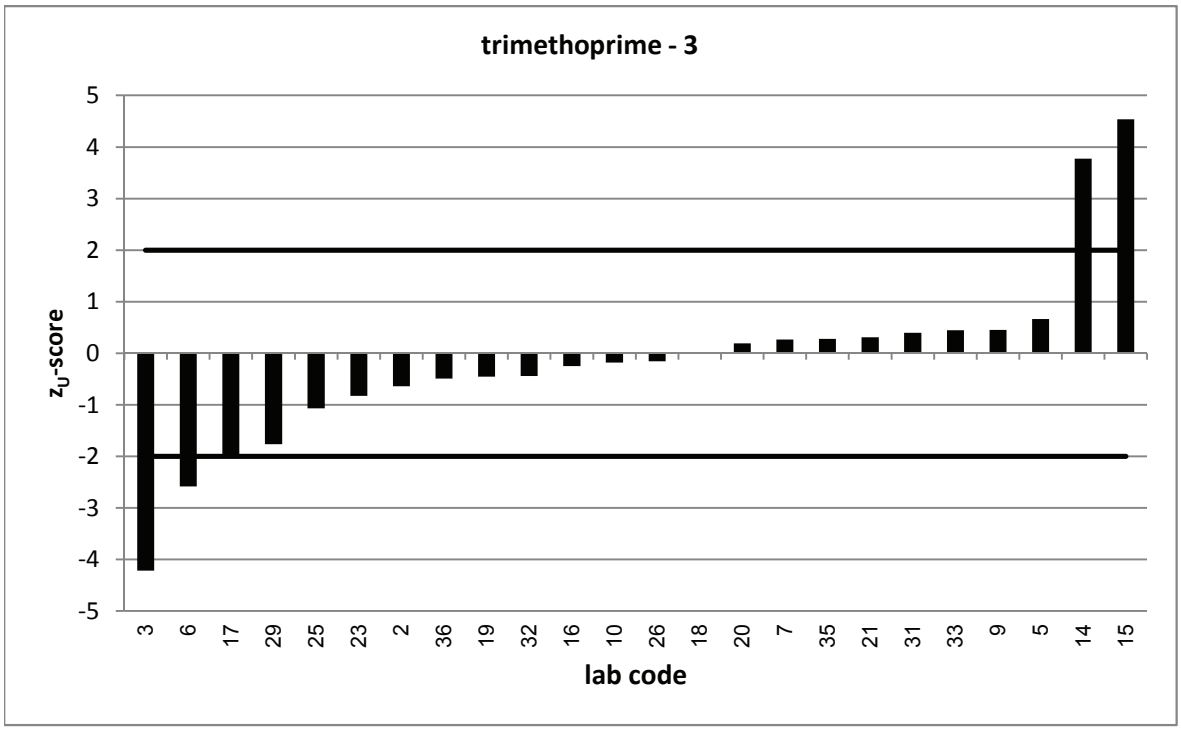

trimethoprime - 2
ζ-Score
7
6
5
4
3
2
1
0
-1
-2
-3
36
6
25
18
7
16
21
14
15
lab code

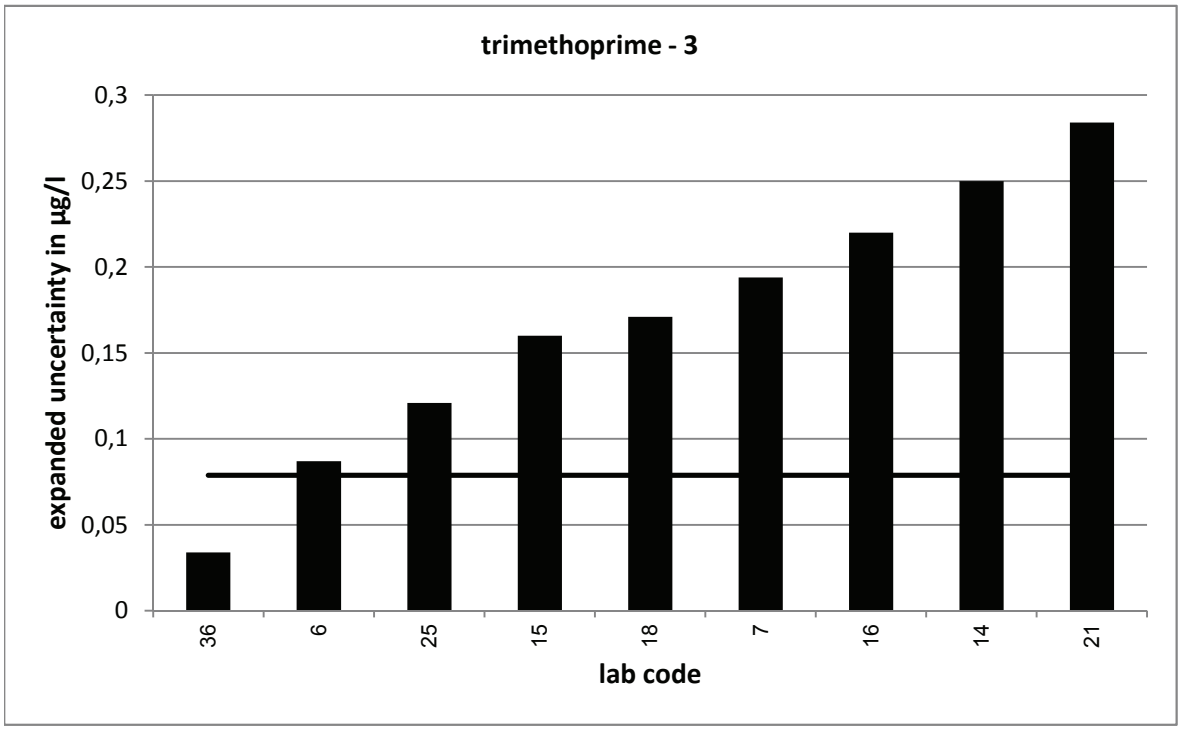
| PT 5/16 - TW S2 | | trimethoprime - 3 | | | |
|---|---|---|---|---|---|
| assigned value [µg/l]* | | | 0,6827 | ± 0,0128 | |
| upper tolerance limit [µg/l] | | | 0,8509 | | |
| lower tolerance limit [µg/l] | | | 0,5335 | | |
| lab code | result [µg/l] | ± | ζ-score | $z_U$-score | assessm.** |
| 2 | 0,635 | | | -0,6 | s |
| 3 | 0,368 | | | -4,2 | u |
| 5 | 0,7383 | | | 0,7 | s |
| 6 | 0,49 | 0,087 | -4,4 | -2,6 | q |
| 7 | 0,705 | 0,194 | 0,2 | 0,3 | s |
| 9 | 0,721 | | | 0,5 | s |
| 10 | 0,669 | | | -0,2 | s |
| 14 | 1 | 0,25 | 2,5 | 3,8 | u |
| 15 | 1,064 | 0,16 | 4,8 | 4,5 | u |
| 16 | 0,664 | 0,22 | -0,2 | -0,3 | s |
| 17 | 0,533 | | | -2,0 | s |
| 18 | 0,684 | 0,171 | 0,0 | 0,0 | s |
| 19 | 0,649 | | | -0,5 | s |
| 20 | 0,699 | | | 0,2 | s |
| 21 | 0,709 | 0,284 | 0,2 | 0,3 | s |
| 23 | 0,621 | | | -0,8 | s |
| 25 | 0,603 | 0,121 | -1,3 | -1,1 | s |
| 26 | 0,671 | | | -0,2 | s |
| 29 | 0,551 | | | -1,8 | s |
| 31 | 0,716 | | | 0,4 | s |
| 32 | 0,65 | | | -0,4 | s |
| 33 | 0,72 | | | 0,4 | s |
| 35 | 0,706 | | | 0,3 | s |
| 36 | 0,646 | 0,034 | -2,0 | -0,5 | s |

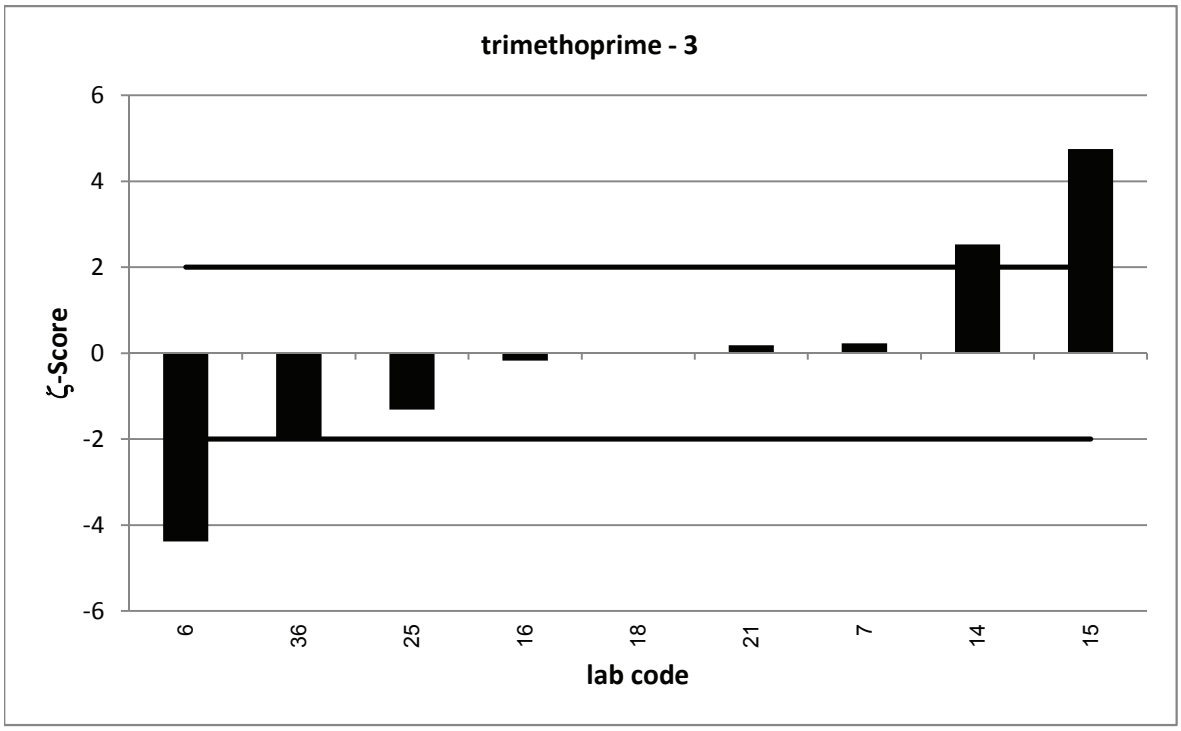
* The stated uncertainty of the assigned value is the expanded uncertainty with a coverage factor k=2 corresponding to a confidence level of about 95%

** s = satisfactory, q = questionable, u = unsatisfactory


trimethoprime - 3
concentration in µg/l
1,2
1
0,8
0,6
0,4
0,2
0
3 6 17 29 25 23 2 36 19 32 16 10 26 18 20 7 35 21 31 33 9 5 14 15
lab code


trimethoprime - 3
$z_U$-score
5
4
3
2
1
0
-1
-2
-3
-4
-5
3 6 17 29 25 23 2 36 19 32 16 10 26 18 20 7 35 21 31 33 9 5 14 15
lab code


trimethoprime - 3
expanded uncertainty in µg/l
0,3
0,25
0,2
0,15
0,1
0,05
0
36
6
25
15
18
7
16
14
21
lab code


trimethoprime - 3
ζ-Score
6
4
2
0
-2
-4
-6
6
36
25
16
18
21
7
14
15
lab code