

To our customers.

From now on, BioLab will show measurement uncertainty (MU) on the Certificate of Analysis (CoA) for all our accredited analyses. Measurement uncertainty is shown in a separate column on the CoA:

Met Nr.	Parameter	Result	MU	Unit
A120	Zinc (Zn)	84	±13	mg/kg
A132*	Tryptophan	0.88	±0.26	g/100g
A01	Crude protein (Kjeldahl)	66.7	±1.3	%

At the bottom of the CoA there is a new text that describes how the measurement uncertainty is stated:

The results are reported with +/- expanded measurement uncertainty (MU). MU is specified with a coverage factor k=2, which corresponds to a 95% confidence interval. Sampling is not included in the MU.

What is measurement uncertainty (MU)?

Measurement uncertainty describes how large the uncertainty in an analyzed result can be. It is a necessary part of the reporting, and a requirement in ISO 17025.

What does coverage factor and 95% confidence interval mean?

±1 standard deviation covers 68% of the values.

±2 standard deviation covers 95% of the values.

A coverage factor k=2 gives a 95% confidence interval, which means that there is a 95% probability that the true value is within the specified interval.

How does MU appear on the Certificate of Analysis?

MU is given with the same unit as the analysis parameter.

Example: 66.7 ± 1.3% protein → the true value is between 65.4 and 68.0% protein with a 95% probability.

For microbiological analyses, the measurement uncertainty is given as an interval in which the true value is within, with a 95% probability.

The example below shows what this can look like for A16 Aerobic microorganisms. For microbiological quantitative methods, it is typical that the measurement uncertainty is asymmetrically distributed.

Met Nr.	Parameter	Result	MU	Unit
A16	Aerobic microorganisms	2300	[-33; +49]%	CFU/g

MU is not given for qualitative microbiological analyses (pos/neg).

What is included in MU?

Random errors (precision): measured via control samples.

Systematic errors (accuracy): measured via comparative laboratory testing (proficiency testing).

These constitute internal and external contributions to MU, respectively.

Is MU the same as measurement error?

No. Measurement errors apply to a single measurement. MU is about the uncertainty of the most likely outcome, not that there is anything wrong with the analysis.

Why is MU missing for some analyses?

MU is given for all accredited analyses. For non-accredited analyses, the calculations are in progress and will be added in due course. For results below the quantification limit, MU is not stated.