Important information concerning the quality measurements

Those of us working in accredited laboratories or dealing with issues concerning the quality of measurements, would like to inform you about some important changes concerning the way the results of measurements are presented. These changes make it easier for you as an end-user to make decisions. Results of analyses cannot be perfect! We hope this does not come as a big surprise to you. We use the term measurements uncertainty to describe this lack of perfection.

In each step of the analytical work, form sampling to the final measurement, deviations from the true value occur and measurement condition vary. We take measures and perform controls regularly to assure that these deviations and variations together are small enough to make sure the end result fulfills your requirements. When we don’t have full information about all of the steps, e.g., when sampling and initial sample preparation are performed by you as a customer, you can assist us by providing detailed information about how that work was performed. Our experts are ready to advise on all matters regarding sampling. Please contact the laboratory beforehand.

The accuracy of the results must of course not be too nor too high since this would increase the costs. It should be fit for the intended purpose. If you are unsure what level of accuracy you need, do not hesitate to contact the laboratory.

Many analyses are made to assure that limiting values are not exceeded. Without information about the measurement uncertainty it may appear to be very easy to make decisions, but these decisions may be incorrect, with, for example, economical consequences when rejecting instead of not accepting a product.
Most laboratories have until now chosen not to state measurement uncertainty in the test report. Instead, such information has only been given when the customer has asked it.

In the future, information about the measurement uncertainty will appear more frequently. This is due to the fact that there are new intimation guides and standards describing a common and partly new terminology. One of the objectives is to make it easier for you as a customer to compare test results.

When reporting the test result we will give the normal information about what we have measured. When the results are followed by uncertainty statements, they are presented as intervals within which the time values are expected to lie with a certain level of confidence (usually 95%). In the example below the lead content is 1.65 ± 0.15 m mol kg⁻¹, that is between 1.50 and 1.80. The measurement uncertainty is also reported in %

Total lead content (Pb) 1.65 m mol kg⁻¹
Measurement uncertainty 0.15 m mol kg⁻¹

The stated uncertainty is an expanded measurement uncertainty (U). It was obtained by multiplying the combined standard uncertainty u with a coverage factor k equal to 2. This corresponds approximately to 95% confidence interval.

The requirements for a consistent way of reporting test results are increasing. Therefore, those of us involved in measurements are eager to assure ourselves that we understand you needs. Hope that you will be satisfied with the final result.

Reference: Based on “Information to our customers concerning the quality of measurement”,
From SWEDAC, Swedish board for Accreditation and Conformity Assessment.