



# MEASUREMENT UNCERTAINTY

## TOP 10 HINTS AND TIPS

Over the years, we've had feedback from labs about how difficult carrying out Measurement Uncertainty (MU) can be.

However, we believe MU is an extremely important tool for your lab and that you shouldn't be put off because it seems too hard.

That's why we've developed the following hints and tips to help you on your Measurement Uncertainty journey.



### **#1 Start at the beginning**

It may sound obvious because the beginning is usually the best place to start! Like any process in your lab, you should prepare for calculating MU by gathering all the information you'll need. That includes your method or procedure. Don't skip what's happening in your calibration or testing processes as well. Questions you could ask yourself to help with this part of the process include - what am I measuring? how will I measure it? what method will I use? what equipment will I need?

### **#2 It's not about the look, it's about the result**

You may want your final MU report to look a certain way to impress the auditors. However, consider whether you really need to use your hard-earned funds to buy commercial software to make your report look pretty. An excel spreadsheet can do exactly what you need without the additional expense. You can add the colours and fancy formatting later.

### **#3 ...but is it validated?**

Just like all your other spreadsheets in use in the lab, if you're using a spreadsheet for MU, make sure it's validated and protected. This needs to occur when you make any changes to the software as well. This process may need to happen annually, in line with your lab's risk profile.

### **#4 What are your assumptions?**

The key point here is to write them down. These details explain to an auditor, or anyone that comes after you in your organisation, what you have assumed to be true and what you don't know. It also helps to demonstrate what you do know to your external auditors.

### **#5 Why should I bother doing MU?**

There are so many reasons and they don't end at 'Because the requirements say so!' MU is a useful risk management tool; helps you work out equipment and calibration needs and strategies and identify method improvements. You can read more about putting together the MU puzzle on our [website](#).

### **#6 Doing MU is just too hard**

Many people approach MU with trepidation but it's really not as difficult as you think! It might look daunting at the start but it's important to remember that YOU are the expert in your lab. You do know some 'stuff' and that knowledge is important and valuable – and not just for MU. You should also think about the consequences for your lab if you don't carry out MU.

### **#7 It doesn't have to be perfect**

Your MU doesn't need to be perfect, and it doesn't have to be very small; it just needs to be fit for purpose. Essentially it can be your 'best guess' if that is what you have to work with at the start and you can build from there.



### #8 When do you stop?

You can keep going but should you? Do you know when to stop in the MU process? You should keep in mind that this is a qualitative vs quantitative issue and that you don't always have to do MU all the way to the end. You need to know and understand the requirements and let them guide you through what you need to do.

### #9 How do I write it up?

A typical report should have seven primary elements. These are:

- Method title
- Author
- Date
- Method performance characteristics: precision, accuracy, limits of detection and quantitation, linearity, selectivity and interferences
- Identification of major uncertainty sources
- Associated raw data used to calculate uncertainty such as spread sheets. Raw data must be adequately referenced
- Calculation of combined uncertainty and expanded uncertainty

This can be easily completed using a spreadsheet and the report kept with the method validation report.

Use this method validation report to help identify critical points in your method that need to be controlled and the calibration assurance program required to deliver appropriate quality results to your customers.

### #10 What if I need help?

That's what we're here for!

Register for our next training session on [2 September](#) and download this full list of tips from our [website](#).

You can also email [info@masmanagementsystems.com.au](mailto:info@masmanagementsystems.com.au) for advice or phone Maree on 0411 540 709.

**Remember, you don't have to do this alone!**