individual lab to be able to use. You must calculate your own mean and 2 SD range for all control materials.

The next section will describe how this should be done.

The Important Calculations

You need to know how to generate sufficient control results to give you the necessary data to calculate the mean and SD for your laboratory. Also the SD is often converted to a percentage figure, the Coefficient of Variation (CV) so you need to know that calculation too.

How many results do I need?
The usual recommendation is for at least 20 measurements over a two-week period, but less can sometimes be okay. However too short a period leads to too small an estimate of result dispersion – in other words will give you narrower i.e. more difficult SDs. A longer period of collecting results is more satisfactory as more operators will be involved and there will be more natural changes included, such as lot numbers of reagents etc.

How many decimals should control results have?
Again, the usual recommendation is that you use one more than the figures for your routine samples, to allow a better estimate of mean and SDs.

How do I calculate the mean value?
Take all the values you get for a particular analyte, add them together, and then divide by the number of values. In ordinary non-stats language, this is called the average, the same thing as the mean. The calculation is usually shown mathematically as follows.

$$\text{Mean} = \frac{\Sigma x_1}{n}$$

What does the mean tell me?
The mean value for a control material gives you an estimate of the central tendency of the distribution of results. In other words, if you compare it to means from another instrument or the same instrument on another month, you will be able to see any changes or differences in accuracy.

How do I calculate SD?
The SD is determined by a series of steps, as follows:

- Calculate the mean, as above
- Take the difference between each control result and the mean
- Square that difference
- Add the sums of all the squared results
- Divide the figure you get by n-1, one less than the number of control results (one less due to the number of degrees of freedom being mathematically one less than the total number of results collected from a sample population)
- Take the square root