Checking Pipette and Weighing Balance Calibration 2

To aid quality management, balance calibration and pipette volume calibration should be checked every three to six months. Apparatus significantly out of calibration should be immediately removed from use until recalibration has been done. All pipettes should carry a unique identifier.

METHOD FOR CHECKING PIPETTE CALIBRATION

1 Pipettes may be for a single volume, for two or three volumes, or have a continuous range of volumes.

- Pipettes with one or two fixed settings are checked at each setting.
- Pipettes with three fixed settings are checked at minimum and maximum setting.
- Pipettes with a continuous range of volume settings: check the maximum setting as well as a volume of around 25% of the maximum setting. That is:
  - 10 ml pipette — 10 ml and 2.5 ml
  - 5 ml pipette — 5 ml and 1.25 ml
  - 1 ml pipette — 1 ml (1000 µl) and 0.25 ml (250 µl)
  - 0.2 ml pipette — 0.2 ml (200 µl) and 0.05 ml (50 µl)
  - 0.1 ml pipette — 0.1 ml (100 µl) and 0.025 ml (25 µl)
  - 50 µl pipette — 50 µl and 15 µl

2 Check calibration by weighing five replicate volumes of distilled water (at room temperature) on a balance. Each weight is recorded in grams (to three decimal places). For practical purposes, 1.000 ml weighs 1.000 g.

RESULTS

Results and any action taken should be recorded.

When a pipette is shown to be inaccurate because the mean pipetted volume differs by more than 10% from stated volume, it must be taken out of use

immediately and not used until re-calibrated following manufacturer's instructions. Pipettes should preferably be accurate within significantly less than 10%.

Note: If a pipette is inaccurate beyond the following limits (mean weight), it must be taken out of use immediately.

- **10 ml pipette**
  10 ml: 9.000 g - 11.000 g
  2.5 ml: 2.250 g - 2.750 g
- **5 ml pipette**
  5 ml: 4.500 g - 5.500 g
  1.25 ml: 1.125 g - 1.375 g
- **1 ml pipette**
  1 ml: 0.900 g - 1.100 g
  0.25 ml: 0.225 g - 0.275 g
- **0.2 ml pipette**
  0.2 ml: 0.180 g - 0.220 g
  0.05 ml: 0.045 g - 0.055 g
- **0.1 ml pipette**
  0.1 ml: 0.090 g - 0.110 g
  025 ml: 0.225 g - 0.0275 g
- **50 µl pipette**
  50 µl: 0.045 g - 0.055 g
  15 µl: 0.013 g - 0.165 g

METHOD FOR CHECKING BALANCES

To ensure their accuracy, calibrated weights are weighed at six-month intervals, and the values recorded.

1. Zero the balance.
2. Weigh the three calibrated weights, one at a time. Record the weights to three decimal places (e.g. 1.003 g).
3. If any weights are outside the stated limits (by >2%), remove them from use until the problem is rectified.