**Table 10.1 Steps in the development of a calibration model**

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| Step 1. Determine or develop the methods to be used as reference for calibration and monitoring |
| Step 2. Determine the standard error of each reference method |
| Step 3. Determine the precision of the spectral data with the materials you will be analyzing |
| Step 4. Identify all sources of possible variance for the materials you will be analyzing |
| Step 5. Assemble samples that accommodate all sources of variance |
| Step 6. Identify or develop a sample preparation system (for reference and NIRS analysis) |
| Step 7. Prepare samples for reference and NIRS analysis |
| Step 8. Identify or develop a sample presentation system |
| Step 9. Develop a repeatability file\* |
| Step 10. Scan samples and view the spectra |
| Step 11. Select samples for calibration/validation on basis of a) reference or b) spectral data |
| Step 12. Perform reference analysis and add to spectral data (if method 11b is to be used) |
| Step 13. Develop calibration model |
| Step 14. Evaluate and optimize calibration model, including wavelength range and math treatment |
| Step 15. Enter calibration model into instrument |
| Step 16. Verify the precision (reproducibility) of the NIRS Analysis |
| Step 17. Verify accuracy by analysis of new samples of known composition |
| Step 18. Carry out slope/bias corrections where necessary |
| Step 19. Re-analyze fresh samples to verify accuracy has been restored |
| \* Optional, but very useful |