



A Guide to Hemp Method Validations

Paper Two — Five Part Series

Executive Summary

Selecting a method that is the correct fit for your facility's needs can be a formidable task, but an easy way to narrow options down is to begin by selecting one that has been validated. To be considered a validated method, a rigorous evaluation incorporating specific study requirements is needed. This paper outlines the requirements that methods must meet to be considered validated and the advantages of a validated method.

Selecting a Method

An online search for potency analysis reveals a plethora of methods offering the fastest turnaround time and lowest limit of detection. This abundance of too good to be true methods can make it daunting for users to determine which method is the best fit to screen their products. Should I select a method with the quickest turnaround time? Or perhaps the one that guarantees the lowest LOD/LOQ? While both of these factors should be incorporated into the selection of testing methods, the first step in the process of narrowing down the list of available methods is to identify an assay that has been rigorously validated. However, this step alone comes with pitfalls as almost all methods will claim to have been validated. This report will provide the informational power needed to make an informed decision to select a method that is fit for purpose and has demonstrated through validation studies that it is appropriate to meet your facility's testing needs.

Requirements for Validation

The first step in selecting a method that will provide you with reliable data is to ask for the validation study report. The study report should contain all of the necessary information and data to evaluate the rigorosity of the validation. The validation report may contain internal validation data, external validation data, or both types of data. In both instances, end users should look for key validation components to define a truly validated method.

1. The method was validated using standardized validation guidelines (FDA, AOAC, USP, ISO). These standardized validation guidelines outline specific study designs and testing requirements that incorporate best practices for method validation and are developed by experts in the field of study through a consensus-based approach, including regulatory, industry, and academia. It ensures that a method is rigorously validated and meets minimum requirements for use in the field.
2. A validated method must provide data for each of the following¹:
 - Matrix studies — These studies evaluate a method's ability to detect (qualitative) or quantify (quantitative) a target analyte in the desired matrix (flower, edible, concentrate, etc.). These studies are designed to challenge the detection limits of a method and traditionally incorporate independent laboratory analysis (e.g., data collected from a third-party, non-biased organization). This can be met through a single laboratory validation or in a multi-laboratory validation. Alternatively, the method developer may take an internal approach to validate the method through independent work.
 - Specificity or interference studies — These studies are designed to evaluate a method's ability to detect the target analytes and discriminate it from non-target analytes without interference or cross-reactivity. For microbiology methods, this involves evaluating a wide panel of strains that comprise the target (e.g., multiple serotypes of *Salmonella* or shiga-toxin producing *E. coli*) and closely related non-target strains. For chemistry methods, this involves evaluating both non-target compounds by themselves to determine if they cross-react with the method as well as testing them in the presence of the target compound (pesticides) to determine if they cause interference with the detection of the target.



- Robustness studies — These studies will evaluate the impact of minor variations on the method’s performance that are routinely observed within a laboratory. Data from these studies provide confidence that a method will work even if the instrument used to perform the method is slightly out of calibration. These studies can be performed separately from the matrix studies or as part of the matrix study in a randomized approach.
- LOD/LOQ — Limit of detection or limit of quantitation studies will provide information on the lowest analyte concentration that can be reliably detected at given confidence or quantitated with an acceptable level of precision and trueness²

Third Party Certification

In many instances, although not all, the method developer will look to have their method certified by a third-party organization (AOAC, NPIP, NCIMS) as a part of the validation process. Regulatory authorities recognize these certifications as acceptable for use by the industry. Each of these certification organizations evaluates methods following standardized validation guidelines, which provide the framework for the validation study. This approach has two main advantages.

- It allows experts to review the method against a list of established performance criteria and determine if the method meets acceptability for certification.
- It allows users to compare data from methods and determine which method is the best fit for their facility.

Advantages of a Validated Method

Validated methods offer distinct advantages that set them apart from other methods.

- Validation provides confidence that a method was rigorously evaluated and fit for purpose for the matrices claimed in the validation scope.
- The independent testing component of a validation demonstrates that a method performed accurately in the hands of routine users and should provide assurance that it will perform similarly at your facility³.
- Validated methods often undergo a peer review process of the data. During the review, the validation data is scrutinized to ensure that the study met study design requirements, the data meets established acceptance criteria, and the method is acceptable for use by industry.
- Many federal or state regulatory agencies require the use of validated methods to ensure safe products reach consumers
- The use of validated methods is a requirement for ISO 17025 accredited laboratories.
 - While the point of testing locations, such as farms or grow facilities, may not need to meet this standard, following this requirement ensures that your facility’s data is both accurate and reliable.

Conclusion

While there are multiple methods available offering the latest and greatest in technology, not all of them will be the most appropriate for your facility. Choosing a validated method assures that the method was thoroughly evaluated and can be performed accurately by routine users while also meeting the requirements set by regulatory agencies. To be sure that the method has been validated and approved, always ask for the validation report or look for an independent certification mark!

- 1 *Additional details on specifics for validation studies can be found in the third paper in this series: Differences in requirements for microbiology, chemistry, and allergen validation studies*
- 2 *See Paper 1 - Validation overview, terminology and definitions for more information on LOD/LOQ*
- 3 *Confirming the method works for your facility is something that will be discussed in the fifth paper in this series: Verification requirements for validated methods*