Analytical Workgroup: Second Report

The analytical workgroup has had five meetings. The workgroup has meet for approximately 30 hours.

Steering Committee needs to provide direction to the workgroup. Prompt and focused guidance is necessary for the the workgroup to deliver a quality product with within this aggressive timeline. Descissions and direction is needed on both programmatic items (e.g. who is the client) and technical issues (e.g. calibration frequency). Decisions that reject or significantly alter recommendations it will require additional time for the workgroup to respond. The meetings are a significant time commitment to the members.

Old Business – Items from First Report

- *Recommedation One – Performance-Based methods* from the first report was not formally approved, however the Steering committee gave the 'nod' for the workgroup to proceed in this direction in order to not stall the progress of the workgroup. The workgroup requests a formal approval of Recommendation One.
- *Recommendation Two – Designation of the "Client"* still needs to be defined. Further discussion of this item is on the 10/18/19 agenda.
- *Minor Recommendations* and *Side Issues* still need to be formally approved.

The First Report recommendation and action items are attached at the end for reference (pages 3-6).

Additional Progress

The workgroup has begun review on a second document – PDP data:

https://www.ams.usda.gov/sites/default/files/media/PDP%20DATA%20SOP.pdf

The workgroup was unable to work through several challenging sections of this document prior to the submission of this report to the Steering Committee on 10/10/19. The workgroup will meet again on 10/16 and continue to working through this document.

New Recommendation

Major Recommendation Three: Use USDA's Pesticide Data Program as a model.

Information on the Pesticide Data Program can be found at:
https://www.ams.usda.gov/datasets/pdp

The Pesticide Data Program (PDP) is a national pesticide residue monitoring program and produces the most comprehensive pesticide residue database in the U.S. The Monitoring Programs Division administers P

DP activities, including the sampling, testing, and reporting of pesticide residues on agricultural commodities in the U.S. food supply, with an emphasis on those commodities highly consumed

by infants and children. The program is implemented through cooperation with State agriculture departments and other Federal agencies. PDP data:

- Enable the U.S. Environmental Protection Agency to assess dietary exposure.
- Facilitate the global marketing of U.S. agricultural products.
- Provide guidance for the U.S. Food and Drug Administration and other governmental agencies to make informed decisions.

What they have been doing on a federal level is a close match to what is proposed to be done in Washington State. PDP testing is conducted by several state labs. Each State Lab has different equipment and procedures. The testing is on agricultural commodities for pesticide. There data is used by many federal agencies. Replace USDA with Washington State, State labs with private labs, various federal agencies with various state agencies and you have the same model. Cannabis is just a different agricultural commodity.

PDP has created a set of SOP that set requirements for laboratories. They are found at:

https://www.ams.usda.gov/datasets/pdp/pdp-standard-operating-procedures

Specific changes recommended to the PDP QC (https://www.ams.usda.gov/sites/default/files/media/PDPQCSOP.pdf)can be found in the model documents section of the First Report. A mock up of the suggested changes is presented in the the provided document: QC Rv 01_draft.

First Report

Major Recommendation One: Performance-based methods

The recommendation is that a specific method, instrument, or detection method is not required instead; a set of performance standards that any method, instrument, or detection method much meet should be set.

A single specific method would require that all laboratories have the same equipment and operate in the same manner. It would not be flexible. It is likely that the compound list and actions levels will change over time. A single method might be obsolete within a couple of years.

A performance-based lab quality standard would set overarching performance requirements for all methods used, not specific to any one method employed. If a new compound were added or an instrument change the lab would need to demonstrate that it could meet the performance requirements using their method employed.

Performance-based standards (and methods) are used by other governmental groups. The group looked at the SANTE/11813/2017 European Commission for Health and Food Safety document "Guidance document on analytical quality control and method validation procedures for pesticide residues and analysis in food and feed" and the USDA, Pesticide Data Program Documents. USDA's Pesticide Data Program provides guidance to state labs conducting multi-residue pesticide testing and has procedures for method performance and validation that the labs must follow.

In the future it is possible that this method may need to conform to standards other than those currently established by the LCB and DOH. If so a performance-based lab quality standard would allow for such changes without a second task force or similar effort. Possible changes could be federal recognition with EPA tolerances and no tolerance compounds requiring more compounds and much lower detection limits, FDA with similar issues, changes to LCB or DOH list, or other unforeseeable actions.

Major Recommendation Two: Designation of a "Client"

Many of the documents for analytical quality control and method validation assume that the lab is doing work for a governmental entity or "Client". The analytical group recommends that this role be formally designated either as a single person/agency or a standing committee. That it would have technical and practical expertise. It would need to be able to speak for the data uses.

Accredited methods are "fit to purpose" methods. If the results generated cannot meet the requirements of the client then the method should not be accredited. Client requirements are more than just a list of compounds and detection levels. Is the data to meet a legal standard? Is it for risk assessment? Data for comparison to a set level? Data of exposure dosage? Each may have different method needs. Ongoing communication between the lab and the client about the specific needs of the client and the technical needs of analytical chemists would allow for the method to be fit to purpose and for the method and the purpose to be adaptable.

All the documents the method group looked at assume a client. ISO 17025, SANTE, and USDA/PDP all assume a client exists who has the final authority to direct, approve and/or deny actions.

Minor Recommendations

1. Sample must be sufficient size for testing. The lab shall reject samples that are too small. The lab will set a minimum size for the method.
2. Sample must meet LCB requirement. 4g, 4 portions. The lab will reject samples that do not meet the LCB requirements for sampling in terms of size and portions. The sample must be delivered to the lab as four portions with each portion 1g or more. If any portion is less that 1g the sample is rejected. If any other sample requirements (filth, moisture,) are not meet the sample is rejected. Sample weight requirements refer to testable portion not filth or steams above 3mm.
3. Testing is as/is. Samples results are reported on an as received basis. Results will not be adjusted based on moisture content.
4. Traceability – Similar to ISO, Samples must have unique ID, all equipment, supplies used in testing that are critical to results (instrument, scales, reagents, solutions, etc.) must be identified and be traceable back to source.
5. Acceptance – Lab must have criteria to accept/reject samples and must note acceptance or reason for rejection.
6. Test is for flower, remove stems above 3mm.
7. Limit of Quantitation (LOQ) must be less than or equal to the action level. The group discussed lower limits but decided that lower limits would not be future proof. As the requirements can change and the method is performance-based. If for instance FDA levels of 10ppb were required instead of the LCB action levels when the method would need to be changed to meet the new requirement.
8. Samples should be refrigerated on arrival (4 +/- 2 ˚C) and stored refrigerated when not being tested for up to 72 hours from the time of arrival at the lab. After that samples should be frozen and stored at -30˚C or lower. Samples may be frozen sooner.

Side Issues

1. Moisture. The standard is 15% moisture but no moisture method is specified. Commonly loss on drying methods are used in place of moisture. As cannabis has other compounds that will be lost on drying. A specific method would need to be set as loss on drying methods are biased against each other. 4h under vacuum at 95˚C? 5h at 105˚C in a convection oven? A true moisture (water) test would be the Karl-Fisher method and is very hard to run on cannabis (or any plant)
2. Metabolites – List. In addition to a list of compounds to test for, a list of what metabolites of the compounds to test for or not to test for would be useful.
3. DOH List – CAS no. Several task members would like DOH to supply CAS numbers for the compounds they list.
4. Micro testing can't be performed on homogenized sample portions due to the contamination potential. The same sample that is to be tested for pesticides is also tested for micro. Pesticides testing wants to kill the microbes as they destroy pesticides. Standard pesticide testing procedures such as freezing, homogenizing (crushing, cutting, blending) will ruin micro testing.
5. Sample must be homogenized for pesticide testing. This is competitive with other tests. One sample is provide for many tests.
6. DOH Levels. DOH web site refers to LCB. Is DOH adopting LCB's action levels? Could they specify them on their document?

7. Reporting in LCB's system, ND, LOQ, LOD, completeness, codes. The current reporting system used by LCB requires the labs to report the false result of zero for non-detects. Analytical chemistry cannot tell you if a compound has 0 (zero) concentration of a pesticide. It can only tell you that it is was not detected and at what level the method would detect it. The current system does not allow the lab to enter the data accurately when it is below the detection limit. Standard practice is to allow codes or test in addition to numeric values on reports as well as method limits of detection and quantitation.

Model Document

USDA PDP – QC SOP, https://www.ams.usda.gov/sites/default/files/media/PDPQCSOP.pdf

The group recommends adopting the USDA/PDP QC SOP with the changes described below. The group also looked at the SANTE document. In the future the group plans to look at more USDA/PDP documents. This is not a complete description of what is needed for a method and the group plans to offer more documents and recommendations in addition to this document. The group found this document useful in describing method QC and Validation procedures.

For section 5.2.3.3 the group did not come to an agreement and the task force is requested to select one of the two alternatives suggested.

The document refers heavily on decisions made by a lab's Quality Assurance Officer (QAO) and Technical Program Manager (TPM). The group needs further meeting before making a recommendations on required lab personal and duties.

Sections without comment are recommended as/is after adjustment for general recommendations.

General Changes

USDA/PDP should be replaced by task force or the "client" in major recommendation two.

Cannabis be considered a "Commodity Group" consisting of the "Commodities":

- High THC Cannabis
- High CBD Cannabis
- High THC/High CBD Cannabis

As an example, the EPA sets up commodity groups, one such is "Pone Fruit", where the commodities in the group would be peaches and apricots. This design will allow different types of cannabis, with different analytic-identified needs, to be treated separately. It is another recommendation that allows for future flexibility while recognizing the complexity of the matrix.

The document refers to USDA forms. The group does not recommend using USDA forms but does recommend that the same information captured on the forms be documented.

Specific Changes

5.1 Required compounds would be the LCB and DOH list as “Priority 1” and “Marker” compounds.
5.2 EPA standards are not available. Instead ISO Guide 34 should be used if available and all standards require a certificate of analysis.
5.2.3.3 Five members recommend it as/is. Two members recommend striking “date and time removed, initials of person removing standard, date and time returned, initials of person returning standard.”
5.2.3.5 Recommend not adopting
5.2.4 Recommend that “separate standard preparation area” not be required for small labs if they have the appropriate cleaning procedures and controls to insure against cross contamination.
“labeled” also included labeled by reference. A lab may put a code on a small vial and have a document that has the required information and can be linked to the code on the vial. It does not mean that all the information has to be written on the vial.
5.2.5 Same as 5.2.4
5.2.7.2.2 This requires client approval. If no client exists it should be eliminated otherwise it would refer to the client in recommendation 2.
5.3.1 All compounds are “Marker compounds” Commodities are the three different types of cannabis identified as three commodities above.
5.9 Cannabis would be a new commodity grouping.
5.15 Method Evaluation Reporting section will depend on the outcome of recommendation two in Major Recommendations. A client is necessary for approvals. Method validation should be documented. If recommendation two is adopted then client should take USDA/PDP place as the approver.
5.17.8 Unusable due to reporting requirements. See Side Issue 7.
5.18.1.1, 5.18.2.1, 5.18.4.1 Recommend 70-130 instead of 50-150, SANTE is 70-120. USDA/PDP is more concerned with trace detection for its risk assessment work is willing to accept grater uncertainty as a result. The group prefers something closer to SANTE but not unbalanced.
5.20 USDA/PDP does the measurement Uncertainty calculations. The lab would need to do this unless the client from recommendation two does it. This will be addressed later.
5.19 This is the proficiency testing requirements. The methods workgroup did not review this as it is the other group’s task. The analytical group will, however, provide guidance to the Proficiency Testing (PT) workgroup. This may include acceptable alternative PT sample matrices (e.g. hemp, hops, etc.), based on this groups’ greater knowledge of pesticide method performance.