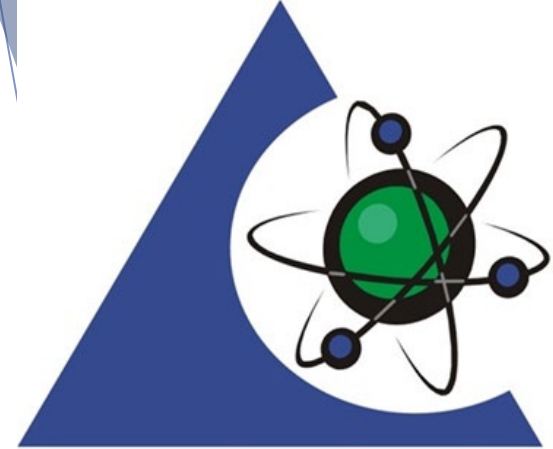


Welcome to the Webinar!

An Overview of AOAC PT Program - Cannabis and Hemp

Presented by:
Shane Flynn, Senior
Director of Proficiency Testing AOAC &
Tracy Szerszen, President-PJLA

May 30, 2024
1:00-2:00 PM EST



PJLA

AOAC
INTERNATIONAL

PT

PROFICIENCY TESTING

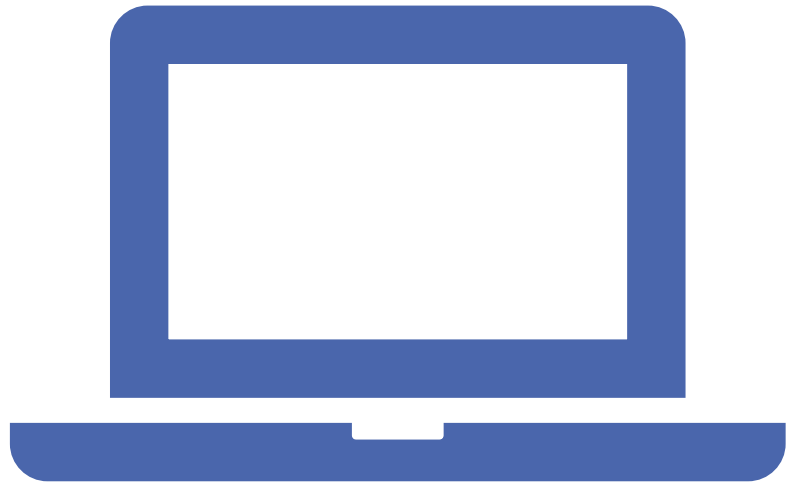
Webinar Overview

Discuss the importance of:

An overview of proficiency testing

Considerations when selecting PTs

Updates to AOAC PT Program and Cannabis and Hemp Supporting Committees, Documents etc.



Webinar Housekeeping

- ▶ This webinar will be recorded
- ▶ All PJLA webinars are made available on our website & YouTube channel
<https://www.pjlabs.com/training/pjla-webinars/past-webinars>
- ▶ All attendees are muted
- ▶ Please utilize the question tool bar to submit questions to be answered at the end of presentation

About the Presenter



- ▶ Shane Flynn is the Senior Director of the AOAC Laboratory Proficiency Testing (PT) Program. Shane helped start the first accredited Proficiency Testing program for food labs in the United States and has been developing new programs to address the needs of the analytical community since.
- ▶ Shane has been with AOAC INTERNATIONAL and specifically the proficiency testing department for 26 years. Through the years he has helped develop numerous proficiency testing programs for Food Chemistry, Food Microbiology, Pesticides, Infant Formula, Environmental and is now developing and managing new programs with his team in various Cannabis/Hemp matrices. In addition to his Proficiency Testing role, he also is the staff liaison for Analytical Laboratory Accreditation Criteria Committee (ALACC) and the Technical Division of Laboratory Management (TDLM). ALACC is a multinational group of experts from varied scientific disciplines and industries that aids in the development and revisions of The AOAC INTERNATIONAL Guidelines for Laboratories Performing Microbiological and Chemical Analyses of Food, Dietary Supplements, Pharmaceuticals, and Cannabis - An Aid to Interpretation of ISO/IEC 17025:2017.

Cannabis &
Hemp

PROFICIENCY
TESTING

Shane Flynn, Senior
Director of Proficiency
Testing

AOAC
INTERNATIONAL



PROFICIENCY TESTING

CANNABIS & HEMP PT

- **What is Proficiency Testing**
- **Why develop a program**
- **What sets our program apart**
- **Selecting a PT Program**
- **Current programs and analytes**
- **Differences in PT Programs**
- **Fit for Purpose/Risk**
- **Quality Assurance & Educational Samples**
- **Programs in development**
- **AOAC Guide - ISO 17025 Interpretation**
- **AOAC Tools & Resources**

PROFICIENCY TESTING

- OBJECTIVE OF PROFICIENCY TESTING
 - To improve analytical performance by providing an independent measure of the quality of the data.

PROFICIENCY TESTING

- **Role of Proficiency Testing in QA: Self Improvement of the Lab**
 - To estimate the relative accuracy and precision of results compared to other laboratories
 - To identify weak methodology
 - To detect training needs
 - To upgrade the overall quality of laboratory performance

PROFICIENCY TESTING

- **Role of Proficiency Testing in QA: Proof of Competence**
 - Prove Technical Competence to Customers
 - Establish International Credibility for Exported Goods
 - Meet Accreditation Requirements for ISO 17025
 - Meet Certification Requirements for SQF and other GFSI certifications
 - Qualify Vendors

PROFICIENCY TESTING

- Accreditation (for Laboratories)
 - ISO/IEC 17025:2017 General Requirements For The Competence Of Testing And Calibration Laboratories
 - specifies the general requirements for the competence, impartiality and consistent operation of laboratories.
 - is applicable to all organizations performing laboratory activities, regardless of the number of personnel.
 - Laboratory customers, regulatory authorities, organizations and schemes using peer-assessment, accreditation bodies, and others use ISO/IEC 17025:2017 in confirming or recognizing the competence of laboratories.

○ Courtesy of ISO



PROFICIENCY TESTING

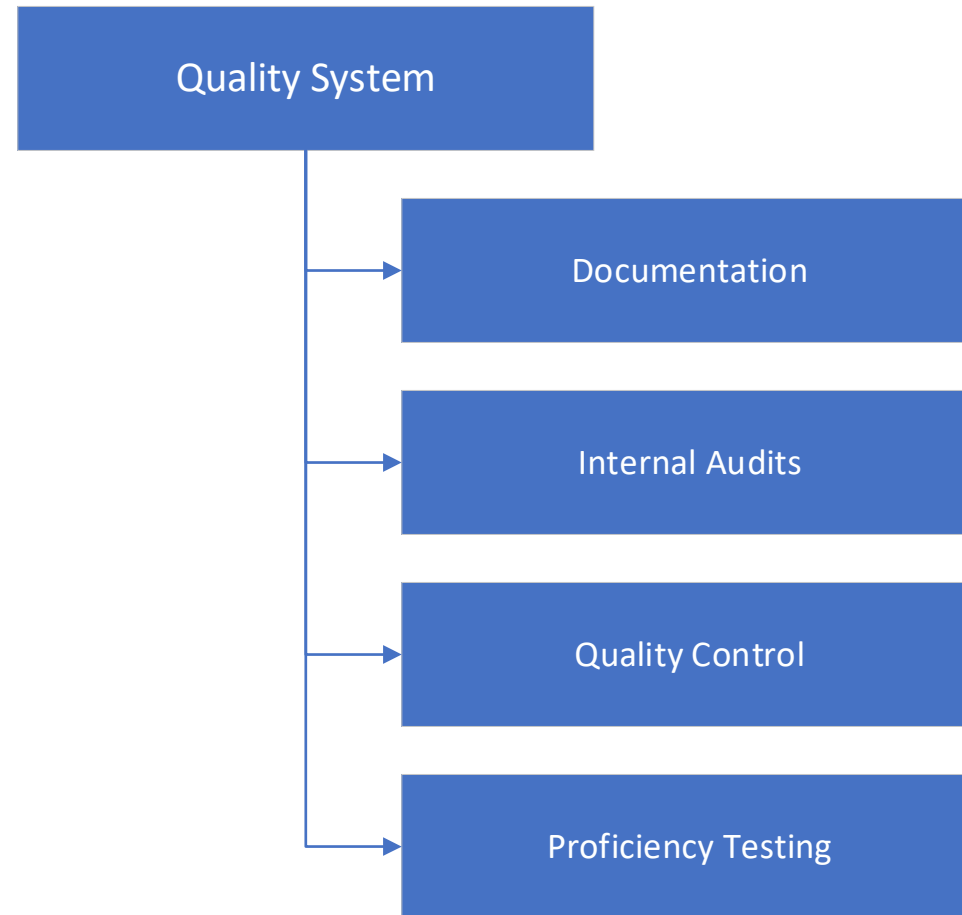
- Accreditation (for PT Providers)
 - ISO/IEC 17043:2023 Conformity Assessment - General Requirements For Proficiency Testing
 - ISO/IEC 17043:2023 specifies general requirements for the competence of providers of proficiency testing schemes and for the development and operation of proficiency testing schemes. These requirements are intended to be general for all types of proficiency testing schemes, and they can be used as a basis for specific technical requirements for particular fields of application.

PROFICIENCY TESTING

- Accreditation (for PT Providers)
 - ISO 13528:2022 Statistical Methods For Use In Proficiency Testing By Interlaboratory Comparison
 - This document provides detailed descriptions of statistical methods for proficiency testing providers to use to design proficiency testing schemes and to analyse the data obtained from those schemes. This document provides recommendations on the interpretation of proficiency testing data by participants in such proficiency testing schemes and by accreditation bodies.
 - The procedures in this document can be applied to demonstrate that the measurement results obtained by laboratories, inspection bodies, and individuals meet specified criteria for acceptable performance.
 - This document is applicable to proficiency testing where the results reported are either quantitative measurements or qualitative observations on test items.

◦ Courtesy of ISO

► Accreditation Requirements



PROFICIENCY TESTING

- **PROFICIENCY TESTING PROGRAM PROCEDURE**
 - Randomly selected sub-samples of test materials are simultaneously distributed to participating laboratories for concurrent testing. The test materials must be homogeneous and stable for the time period and storage conditions during shipment and analysis.
 - Participating laboratories analyze the test materials.
 - Results submitted to proficiency testing provider by the deadline.

PROFICIENCY TESTING

- **PROFICIENCY TESTING PROGRAM PROCEDURE (CONTINUED)**
 - Statistical software analyzes and calculates results. Laboratories are assessed on the difference between their result and the assigned value. A performance score based on a z-score is calculated for each laboratory for each test. Reports are distributed to participating laboratories.
 - Test materials are distributed on a regular basis to provide an opportunity to measure performance and identify and correct problems.

PROFICIENCY TESTING

For each individual result, a z-score was calculated as follows:
where:

$$Z_i = \frac{X_i - X_{pt}}{\delta_{pt}}$$

Z_i = the z score (standard score)

X_i = the reported value of analyte

X_{pt} = the assigned value, the best estimate of the true concentration

δ_{pt} = the estimate of variation (standard deviation)

<u>Result Obtained</u>	<u>Rating</u>
$ z \leq 2$	Satisfactory
$2 < z < 3$	Questionable
$ z \geq 3$	Unsatisfactory

Why Develop a Program

- Participating Labs must spike their own samples
 - Creates additional opportunity for errors to occur
- Cannabis labs must analyze Hemp
- Pesticide analyses much different for cannabis v hemp
- Cannabinoids are lower in hemp so the same dilution scheme may not be appropriate for labs doing only high THC material.
- AOAC Provides Ready to analyze samples in the actual matrix
 - Reduces opportunity for error
- AOAC's Provides >0.3% delta-9-THC Cannabis
- Has pesticide sample in Cannabis
- AOAC Micro Programs -Cannabis Matrix



What Sets Our Program Apart



In addition to Hemp, AOAC can ship >0.3% delta-9-THC Cannabis

AOAC samples arrive homogeneous and ready to analyze, no spiking required

Use of reference labs for statistics (most competitors use consensus)

Scientific Association with many SMEs

Developed through CASP based on feedback from over 500 stakeholders

Less expensive than top competitors

Selecting a PT Program

Differences in PT Programs

Fit for Purpose

Risk

Impact on Quality System

Differences in PT Programs

- Matrices
 - Is your PT matrix like a “Routine Sample”?
 - Does the lab have to spike the sample themselves
 - Does a lab have to purchase the calibration standard from PT provider
- Assigned /Target Values
 - Consensus
 - Reference Labs
 - Spiked Values
- Evaluations
 - Z scores
 - Z' scores (z prime)
 - Ranges
 - others

Fit for Purpose

- Is your PT matrix like a “Routine Sample”?
- Can your lab receive > 0.3% THC Cannabis
 - If not, what is the next best thing
 - Actual hemp v tea leaves or other surrogate matrix
 - If yes, is hemp an appropriate surrogate for cannabis
- Are the evaluations appropriate?

Risk

- Risk Management
 - Accuracy and Reliability of Results: Laboratories perform tests and experiments that impact critical decisions in various fields. Effective risk management helps maintain the accuracy and reliability of results by minimizing errors and ensuring consistent quality
- Risk Assessment
 - Risk assessment determines possible mishaps, their likelihood and consequences, and the tolerances for such events. The results of this process may be expressed in a quantitative or qualitative fashion. Risk assessment is an inherent part of a broader risk management strategy to help reduce any potential risk-related consequences.
 - More precisely, risk assessment identifies and analyses potential (future) events that may negatively impact individuals, assets, and/or the environment. It also makes judgments "on the tolerability of the risk on the basis of a risk analysis" while considering influencing factors (i.e. risk evaluation)

AOAC Participant Reports

Round Information

Sample Preparation information

Instructions for Analysis

Results – Evaluation & Scoring

Z score Plots

Distribution

Homogeneity

Appendix A
CH01/CH02 Hemp Proficiency Testing Program
-- Blue Sample --
Site=184683 Lab Reporting Details

Site	Program	Metric	Value
184683	CH01	Lab Name	
		Analyst Name	
		Test Initiation Date	
		Test Close Date	
		Submission Date	
		Preliminary Report Issued Date	



Report Issued by:
AOAC INTERNATIONAL
2275 Research Blvd. Ste 300
Rockville, MD 20850

Report Authorized by:
Shane Flynn, Senior Director of Proficiency Testing

Appendix A
CH01/CH02 Hemp Testing Results and Z-scores
Site=184683 Blue Sample Analyte Group = Cannabinoids

Test	Method	Reported Result	Acceptable Range	Number of Reported Results	Participant Mean	Participant Median	Participant SD	Ref Lab Median Value	Assigned Value	Target SD	Z-Score	Evaluation	Standard Uncertainty of the Assigned Value	Note
% Cannabindiol (CBD)		3.6500	(1.534 - 6.134)	9	3.402	3.581	0.440	3.7420	3.834	0.767	-0.240	ACCEPTABLE	0.094	
% Cannabidiolic acid (CBDA)		2.6900	(1.076 - 4.304)	9	2.245	2.350	0.409	2.6415	2.690	0.538	0.000	ACCEPTABLE	0.055	
% Cannabinol (CBN)		0.0367	(0.010664 - 0.063)	8	0.030	0.034	0.019		0.027	0.005	0.837	ACCEPTABLE	0.011	
% Cannabinolic acid (CBNA)	Not Tested			2	0.006	0.006	0.005					NO EVALUATION		Not Tested by Ref Labs
% Cannabigerol (CBG)		0.1460	(0.047 - 0.285)	8	0.159	0.156	0.080	0.1670	0.166	0.033	-0.506	ACCEPTABLE	0.021	
% Cannabichromene (CBC)		0.1570	(0.067 - 0.307)	8	0.155	0.164	0.038	0.1870	0.187	0.037	-0.752	ACCEPTABLE	0.014	
% Cannabichromenic acid (CBCA)	Not Tested			4	0.196	0.195	0.034		0.236	0.047		NO EVALUATION		Not Used for Evaluation
% Cannabidivarinic acid (CBDVA)	Not Tested			4	0.014	0.011	0.016		0.001	0.000		NO EVALUATION		Not Used for Evaluation
% Cannabigerolic acid (CBGA)		2.6900	(1.076 - 4.304)	7	2.621	2.690	0.490	2.7405	2.690	0.538	0.000	ACCEPTABLE	0.105	
% Cannabidivarin (CBDV)		0.0002	(0.00028 - 0.002)	7	0.026	0.020	0.030	< 0.0007	0.001	0.000	-0.902	ACCEPTABLE	0.001	
% Δ8-tetrahydrocannabinol (Δ8-THC)		0.0002	(0.00024 - 0.002)	8	0.028	0.018	0.033	< 0.0006	0.001	0.000	-0.906	ACCEPTABLE	0.000	
% Δ9-tetrahydrocannabinol (Δ9-THC)		0.1630	(0.059 - 0.301)	9	0.157	0.150	0.023	0.1715	0.180	0.036	-0.421	ACCEPTABLE	0.018	
% Tetrahydrocannabinolic acid (THCA)		0.0809	(0.032 - 0.128)	9	0.071	0.068	0.015	0.0795	0.080	0.016	0.056	ACCEPTABLE	0.001	
% Tetrahydrocannabivarin (THCV)		0.0004	(0.00024 - 0.001)	8	0.016	0.008	0.018	< 0.0006	0.001	0.000	-0.850	ACCEPTABLE	0.000	
% Tetrahydrocannabivarinic acid (THCVA)	Not Tested			4	0.009	0.004	0.012	< 0.0158	0.016	0.003		NO EVALUATION		Not Used for Evaluation
% Total CBD = (CBDA * 0.877) + CBD		6.0000	(2.443 - 9.773)	9	5.370	5.556	0.774	6.0540	6.108	1.222	-0.088	ACCEPTABLE	0.116	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

A result that gives $|z| \leq 2.0$ is considered to be ACCEPTABLE

A result that gives $2.0 < |z| < 3.0$ is considered to give a Warning signal (ACCEPTABLE)

A result that gives $|z| \geq 3.0$ is considered to be UNACCEPTABLE (or action signal)

Appendix A
CH01/CH02 Hemp Testing Results and Z-scores
Site=184683 **Blue Sample** Analyte Group = Cannabinoids

Test	Method	Reported Result	Acceptable Range	Number of Reported Results	Participant Mean	Participant Median	Participant SD	Ref Lab Median Value	Assigned Value	Target SD	Z-Score	Evaluation	Standard Uncertainty of the Assigned Value	Note
% Total CBG = (CBGA * 0.878) + CBG		2.5100	(1.004 - 4.016)	6	2.561	2.555	0.476	2.5640	2.510	0.502	0.000	ACCEPTABLE	0.073	
% Total THC = (THCA * 0.877) + Δ9-THC		0.2340	(0.066 - 0.402)	9	0.211	0.203	0.033	0.2165	0.234	0.047	0.000	ACCEPTABLE	0.031	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):
A result that gives $|z| \leq 2.0$ is considered to be **ACCEPTABLE**
A result that gives $2.0 < |z| < 3.0$ is considered to give a **Warning signal (ACCEPTABLE)**
A result that gives $|z| \geq 3.0$ is considered to be **UNACCEPTABLE (or action signal)**

Appendix A
CH01/CH02 Hemp Testing Results and Z-scores
Site=184683 Blue Sample Analyte Group = Terpenes

Test	Method	Reported Result	Acceptable Range	Number of Reported Results	Participant Mean	Participant Median	Participant SD	Ref Lab Median Value	Assigned Value	Target SD	Z-Score	Evaluation	Standard Uncertainty of the Assigned Value	Note
% 3-carene		0.0001	(0.00036 - 0.004)	7	0.007	0.001	0.015	< 0.0009	0.001	0.000	-0.915	ACCEPTABLE	0.001	
% Alpha-bisabolol		0.1180	(0.037 - 0.150)	8	0.082	0.085	0.045	0.1058	0.094	0.019	1.303	ACCEPTABLE	0.001	
% Alpha-cedrene		0.0001		3	0.002	0.001	0.003		0.000	0.000		NO EVALUATION		Not Used for Evaluation
% Alpha-humulene		0.0513	(0.019 - 0.074)	8	0.055	0.049	0.028	0.0463	0.046	0.009	0.540	ACCEPTABLE	0.001	
% Alpha-phellandrene		0.0001		3	0.001	0.001	0.001		0.000	0.000		NO EVALUATION		Not Used for Evaluation
% Alpha-pinene		0.0152	(0.006 - 0.025)	8	0.023	0.014	0.030	0.0156	0.016	0.003	-0.128	ACCEPTABLE	0.000	
% Alpha-terpinene		0.0001	(0.00036 - 0.004)	8	0.007	0.002	0.014	< 0.0009	0.001	0.000	-0.915	ACCEPTABLE	0.001	
% Beta-caryophyllene		0.1290	(0.039 - 0.219)	6	0.142	0.136	0.037	0.1360	0.129	0.026	0.000	ACCEPTABLE	0.015	
% Beta-myrcene		0.0131	(0.005 - 0.021)	7	0.021	0.013	0.023	0.0131	0.013	0.003	0.038	ACCEPTABLE	0.000	
% Beta-ocimene		0.0001	(0.00024 - 0.002)	8	0.018	0.003	0.032	< 0.0006	0.001	0.000	-0.912	ACCEPTABLE	0.001	
% Beta-pinene		0.0037	(0.002 - 0.007)	8	0.011	0.005	0.020	0.0044	0.004	0.001	-0.852	ACCEPTABLE	0.000	
% Borneol		0.0047		5	0.004	0.005	0.002	0.0056	0.006	0.001		NO EVALUATION		Not Used for Evaluation
% Camphene		0.0001	(0.000 - 0.000)	7	0.001	0.001	0.002	0.0013	0.000	0.000	-0.150	ACCEPTABLE	0.000	
% Camphor		0.0001		4	0.012	0.003	0.020		0.021	0.004		NO EVALUATION		Not Used for Evaluation
% Cedrol		0.0001		4	0.002	0.002	0.002		0.000	0.000		NO EVALUATION		Not Used for Evaluation
% Cis-nerolidol		0.0001	(0.00016 - 0.001)	8	0.017	0.002	0.035	< 0.0004	0.000	0.000	-0.907	ACCEPTABLE	0.000	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

A result that gives $|z| \leq 2.0$ is considered to be ACCEPTABLE

A result that gives $2.0 < |z| < 3.0$ is considered to give a Warning signal (ACCEPTABLE)

A result that gives $|z| \geq 3.0$ is considered to be UNACCEPTABLE (or action signal)

Appendix A
CH01/CH02 Hemp Testing Results and Z-scores
Site=184683 Blue Sample Analyte Group = Terpenes

Test	Method	Reported Result	Acceptable Range	Number of Reported Results	Participant Mean	Participant Median	Participant SD	Ref Lab Median Value	Assigned Value	Target SD	Z-Score	Evaluation	Standard Uncertainty of the Assigned Value	Note
% Eucalyptol		0.0001	(0.001 - 0.010)	6	0.008	0.002	0.017	< 0.0025	0.003	0.001	-0.917	ACCEPTABLE	0.003	
% Fenchone		0.0001		3	0.002	0.001	0.003		0.000	0.000		NO EVALUATION		Not Used for Evaluation
% Fenchyl alcohol		0.0067		4	0.021	0.007	0.030		0.007	0.001		NO EVALUATION		Not Used for Evaluation
% Gamma-terpinene		0.0001		7	0.021	0.002	0.037	< 0.0210	0.021	0.004		NO EVALUATION		Not Used for Evaluation
% Geraniol		0.0001		7	0.012	0.003	0.018	< 0.0210	0.021	0.004		NO EVALUATION		Not Used for Evaluation
% Guaiol		0.0422	(0.0068 - 0.070)	8	0.046	0.034	0.054	< 0.0296	0.017	0.003	1.435	ACCEPTABLE	0.017	
% Isoborneol		0.0001		3	0.002	0.001	0.003		0.000	0.000		NO EVALUATION		Not Used for Evaluation
% (-)-Isopulegol		0.0001	(0.00036 - 0.004)	8	0.007	0.002	0.014	< 0.0009	0.001	0.000	-0.915	ACCEPTABLE	0.001	
% Limonene		0.0125	(0.005 - 0.021)	8	0.020	0.013	0.021	0.0150	0.013	0.003	-0.229	ACCEPTABLE	0.001	
% Linalool		0.0102	(0.004 - 0.016)	8	0.020	0.010	0.029	0.0105	0.010	0.002	0.000	ACCEPTABLE	0.001	
% Menthol		0.0001		3	0.001	0.001	0.000	< 0.0005	0.000	0.000		NO EVALUATION		Not Used for Evaluation
% O-cymene	Not Tested			3	0.002	0.003	0.001					NO EVALUATION		Not Tested by Ref Labs
% Pulegone		0.0001		3	0.002	0.001	0.003		0.000	0.000		NO EVALUATION		Not Used for Evaluation
% Terpineol		0.0058		5	0.006	0.006	0.002	0.0070	0.007	0.001		NO EVALUATION		Not Used for Evaluation
% Terpinolene		0.0010	(0.001 - 0.008)	7	0.021	0.003	0.036	< 0.0038	0.003	0.001	-0.894	ACCEPTABLE	0.002	
% Trans-nerolidol		0.0010	(0.00372 - 0.037)	8	0.011	0.009	0.010	< 0.0052	0.009	0.002	-0.915	ACCEPTABLE	0.009	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

A result that gives $|z| \leq 2.0$ is considered to be **ACCEPTABLE**

A result that gives $2.0 < |z| < 3.0$ is considered to give a **Warning signal (ACCEPTABLE)**

A result that gives $|z| \geq 3.0$ is considered to be **UNACCEPTABLE (or action signal)**

Appendix A
CH01/CH02 Hemp Testing Results and Z-scores
Site=184683 Blue Sample Analyte Group = Heavy Metals

Test	Reported Method Result	Acceptable Range	Number of Reported Results	Participant Mean SD	Participant Median	Participant Median	Ref Lab Median Value	Assigned Value	Target SD	Z-Score	Evaluation	Standard Uncertainty of the Assigned Value	Note
ug/kg Total Arsenic	451.0000	(0.000 - 589.889)	7	235.645	221.892	110.959	274.0000	260.000	52.000	1.737	ACCEPTABLE	96.891	
ug/kg Total Cadmium	125.0000	(40.682 - 209.318)	7	138.031	134.248	54.447	129.5000	125.000	25.000	0.000	ACCEPTABLE	12.843	
ug/kg Total Lead	483.0000	(194.440 - 777.760)	7	492.906	544.161	116.424	513.0500	486.100	97.220	-0.032	ACCEPTABLE	3.318	
ug/kg Total Mercury	20.8000	(0 - 33.280)	7	35.243	9.400	61.476	> 20.4000	20.800	4.160	0.000	ACCEPTABLE	0.856	
ug/kg Antimony	Not Tested		1	50.000	50.000						NO EVALUATION		Not Tested by Ref Labs
ug/kg Barium	Not Tested		1	38552.850	38552.850						NO EVALUATION		Not Tested by Ref Labs
ug/kg Chromium	Not Tested		2	438.770	438.770	250.202					NO EVALUATION		Not Tested by Ref Labs
ug/kg Copper	Not Tested		1	16624.510	16624.510						NO EVALUATION		Not Tested by Ref Labs
ug/kg Nickel	Not Tested		1	1596.202	1596.202						NO EVALUATION		Not Tested by Ref Labs
ug/kg Silver	Not Tested		1	50.000	50.000						NO EVALUATION		Not Tested by Ref Labs
ug/kg Selenium	Not Tested		1	500.000	500.000						NO EVALUATION		Not Tested by Ref Labs
ug/kg Zinc	Not Tested		1	81607.290	81607.290						NO EVALUATION		Not Tested by Ref Labs

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

A result that gives $|z| \leq 2.0$ is considered to be **ACCEPTABLE**

A result that gives $2.0 < |z| < 3.0$ is considered to give a **Warning signal (ACCEPTABLE)**

A result that gives $|z| \geq 3.0$ is considered to be **UNACCEPTABLE (or action signal)**

Appendix A
CH01/CH02 Hemp Testing Results and Z-scores
Site=184683 **Blue Sample** Analyte Group = Water Activity

Test	Method	Reported Result	Acceptable Range	Number of				Ref Lab Median Value	Assigned Value	Target SD	Z-Score	Evaluation	Standard Uncertainty of the Assigned Value	Note
				Reported Results	Participant Mean	Participant Median	Participant SD							
Water Activity (a _w)		0.4300	(0.172 - 0.688)	7	0.469	0.462	0.041	0.4500	0.430	0.086	0.000	ACCEPTABLE	0.001	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

*A result that gives $|z| \leq 2.0$ is considered to be **ACCEPTABLE***

*A result that gives $2.0 < |z| < 3.0$ is considered to give a **Warning signal (ACCEPTABLE)***

*A result that gives $|z| \geq 3.0$ is considered to be **UNACCEPTABLE (or action signal)***

CH01/CH03 Hemp Proficiency Testing Program
(Pesticides and Mycotoxins)

Site=184683 Lab Reporting Details

Site	Program	Metric	Value
184683	CH01	Lab Name	
		Analyst Name	
		Test Initiation Date	
		Test Close Date	
		Submission Date	
		Final Report Issued Date	



Report Issued by:
AOAC INTERNATIONAL
2275 Research Blvd. Ste 300
Rockville, MD 20850

Report Authorized by:
Shane Flynn, Senior Director of Proficiency Testing

Appendix A

CH01/CH03 Hemp Testing Results and Z-scores

Site=184683 **Red Sample** Analyte Group = Pesticides (ug/kg ppb)

Test	Reported result	Acceptable Range	Number of reported results	Participant Mean	Participant Median	Participant SD	Assigned Value	Target SD	Median of Ref Labs	Z-score	Evaluation	Standard uncertainty of the assigned value	Notes
Bifenazate	55.8000	(25.6 - 102.4)	8	66.822	61.305	22.225	64.000	12.800	65.950	-0.64	ACCEPTABLE	5.657	
Chlorpyrifos	152.0000	(64 - 256)	9	129.217	152.000	47.779	160.000	32.000	157.000	-0.25	ACCEPTABLE	13.333	
Dichlorvos	< 9.9800	(52.48 - 209.92)	6	109.313	116.689	27.843	131.200	26.240	120.390		ACCEPTABLE		Reported as < (LOD or LOQ)
Fludioxonil	78.2000	(38.4 - 153.6)	7	120.215	95.000	53.528	96.000	19.200	91.000	-0.93	ACCEPTABLE	9.071	
Methomyl	202.0000	(87.04 - 348.16)	9	234.123	205.000	80.925	217.600	43.520	200.000	-0.36	ACCEPTABLE	18.133	
Methyl parathion	72.5000	(40.96 - 163.84)	4	89.709	79.328	26.093	102.400	20.480	86.000	-1.46	ACCEPTABLE	12.800	
Spirotetramat	198.0000	(96 - 384)	9	248.124	231.798	34.110	240.000	48.000	248.370	-0.88	ACCEPTABLE	20.000	
Thiacloprid	113.0000	(51.2 - 204.8)	9	133.189	122.000	39.358	128.000	25.600	133.640	-0.59	ACCEPTABLE	10.667	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

A result that gives $|z| \leq 2.0$ is considered to be **Acceptable**

A result that gives $2.0 < |z| < 3.0$ is considered to give a **Warning signal (Acceptable)**

A result that gives $|z| \geq 3.0$ is considered to be **Unacceptable (or action signal)**

Appendix A

CH01/CH03 Hemp Testing Results and Z-scores

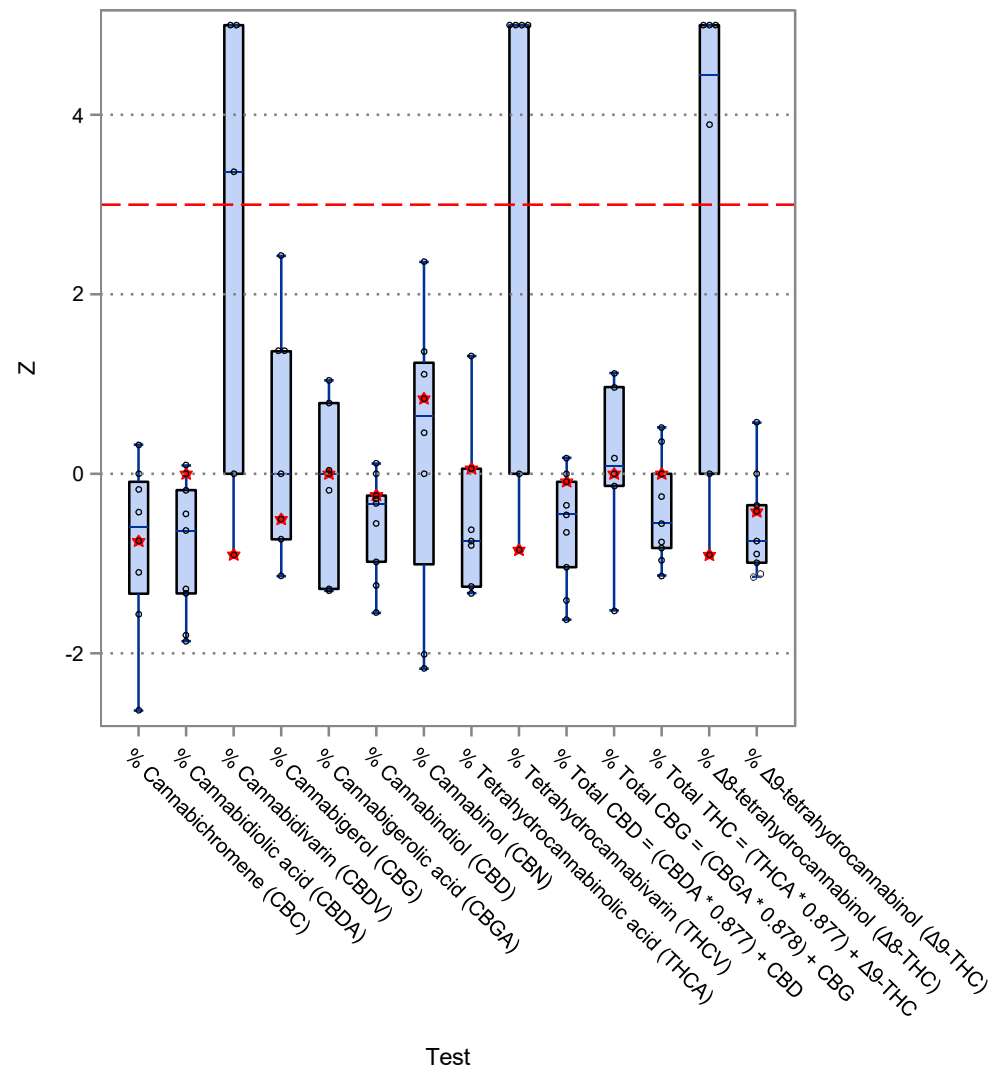
Site=184683 **Red Sample** Analyte Group = Mycotoxins (ug/kg ppb)

Test	Reported result	Acceptable Range	Number of reported results	Participant Mean	Participant Median	Participant SD	Assigned Value	Target SD	Median of Ref Labs	Z-score	Evaluation	Standard uncertainty of the assigned value	Notes
Aflatoxin_B1	7.4100	(6.4 - 25.6)	9	11.874	12.450	3.436	16.000	3.200	12.450	-2.68	ACCEPTABLE	1.333	
Aflatoxin_B2	21.0000	(9.6 - 38.4)	9	18.587	20.420	5.337	24.000	4.800	21.000	-0.63	ACCEPTABLE	2.000	

The following interpretation of z-scores for each individual test result is provided in ISO/IEC 17043:2023(E):

- A result that gives $|z| \leq 2.0$ is considered to be **Acceptable**
- A result that gives $2.0 < |z| < 3.0$ is considered to give a **Warning signal (Acceptable)**
- A result that gives $|z| \geq 3.0$ is considered to be **Unacceptable (or action signal)**

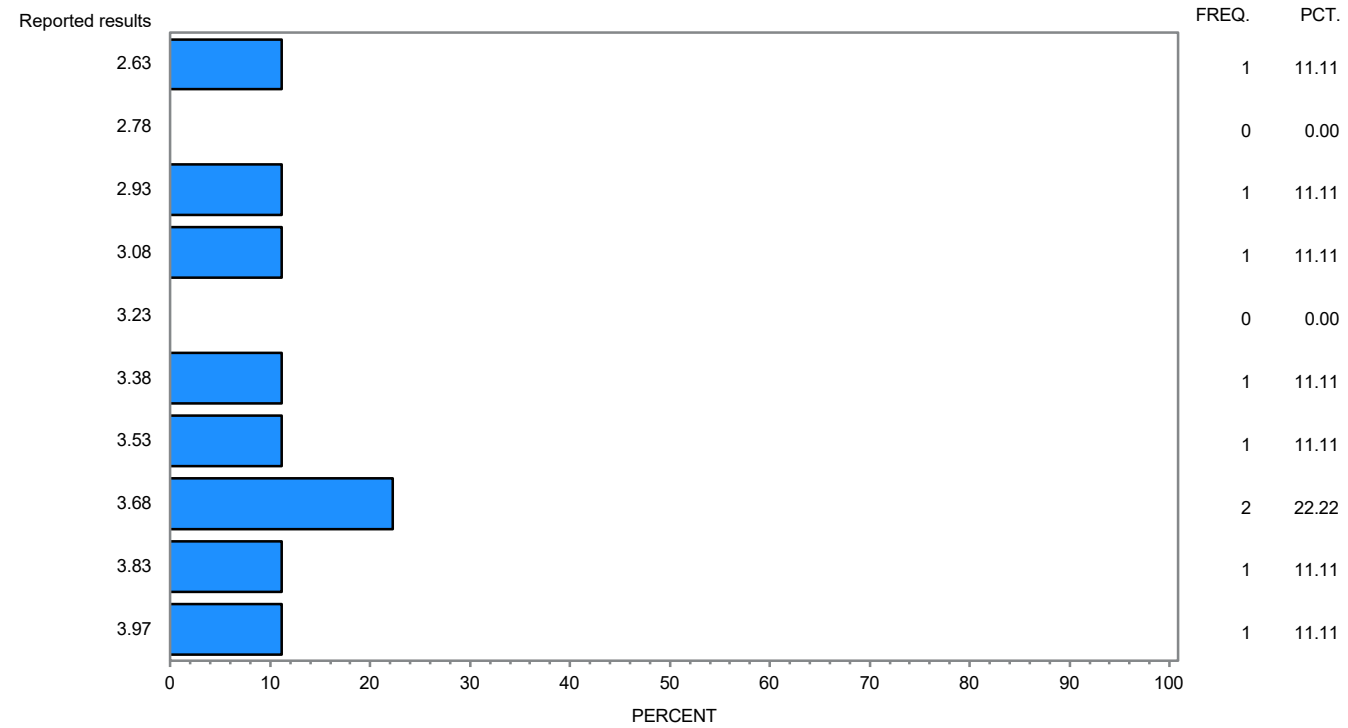
CH01/CH02 Hemp Z-Score Distributions
Blue Sample - Cannabinoids
Site = 184683



Note: Your Result(Red Star) Compared to All Results

CH01 Hemp Blue Sample
Frequency Chart of Reported Results
Site = 184683

Analyte=Cannabinoids Test=% Cannabindiol (CBD)



AOAC Chemical Constituents & Contaminants PT

PT Round	Analytes	Matrices	Shipping Date
Programs #CH01 –3,CH05 ACCREDITED	<ul style="list-style-type: none"> • Cannabinoids (18) • Terpenes (33) • Water Activity • Moisture • Heavy Metals (12) • Pesticide Residues (104) • Mycotoxins (5) 	Dried Flower/Biomass <0.3% THC Hemp & >0.3% THC Cannabis	4/8/2024 & 9/23/2024
Programs #CHD01-CHD06 In Process for Accreditation	<ul style="list-style-type: none"> • Cannabinoids (18) • Terpenes (33) • Water Activity • Heavy Metals (12) • Pesticide Residues (104) • Mycotoxins (5) • Residual Solvents 	Oil <0.3% THC & >0.3% THC	Pilot 1/29/2024 Live Round Q3
Programs #CHE01-CHE06 In Process for Accreditation	<ul style="list-style-type: none"> • Cannabinoids (18) • Terpenes (33) • Moisture • Water Activity • Heavy Metals (12) • Pesticide Residues (104) • Mycotoxins (5) • Residual Solvents 	Gummies <0.3% THC & >0.3% THC	Pilot 8/TBD/2024 Live round Q4



AOAC Microbial Contaminants PT

PT Round	Analytes	Matrices	Shipping Date
Programs #CHM01-CHM06 In Process for Accreditation	<u>Qualitative</u> <ul style="list-style-type: none">• Aspergillus• E.coli (STEC)• <i>Salmonella</i>• <i>S. aureus</i> <u>Quantitative</u> <ul style="list-style-type: none">• APC/TAC• Coliforms• E. coli (generic)• BTGN/Enterobacteriaceae• Y&M	Dried Flower/Biomass <0.3% THC	Pilot 3/4/2024 Live round Q4

AOAC is the only Accredited PT provider with this many analytes able to ship > 0.3% THC Cannabis across state lines and internationally

www.AOAC.org for more information (Request a Sample Report)

Quality Assurance & Educational Samples (QAES)

Proficiency Testing EQA		QAES	
Experienced Lab Personnel		New/Inexperienced Lab Personnel	
Established/Validated Methods		New Methods	
Meets Accreditation/Certification		Training	
.....More	More	

Programs Being Assessed

Additional Programs being Assessed	
Foreign Matter	Beverages
Chocolate	<i>Lab Shopping</i> <i>Secret Shopper Samples</i>

AOAC INTERNATIONAL Guidelines for Laboratories Performing Microbiological and Chemical Analyses of Food, Dietary Supplements, Pharmaceuticals, and Cannabis

An Aid to Interpretation of ISO/IEC 17025:2017

- A Revision of the ALACC Criteria: February 2024
- Includes Complete ISO 17025:2017 Standard

AOAC GUIDE

- ALACC
 - Analytical Laboratory Accreditation Criteria Committee
 - ALACC was formed to help labs meet the challenges of accreditation.
 - “Helps take the grey out” of ISO 17025
 - Revision of main AOAC Guide and addition of Cannabis sections
- *4.2.2 When the laboratory is required by law or authorized by contractual arrangements to release confidential information, the customer or individual concerned shall, unless prohibited by law, be notified of the information provided.*
- *4.2.2 (CANN) The laboratory shall notify the customer or individual concerned when customer data and other confidential information is required to be released to a third-party database such as METRC, LEAF or other regulatory specified system.*

The Tools Your Lab Needs

Standard Method
Performance
Requirements
(SMPR)

Official Methods
of Analysis (OMA)

Performance
Tested Methods
(PTM)

AOAC Guide -
Interpreting ISO
17025

Proficiency
Testing

CASP
Training and
Education



To Enroll or for Additional Information visit AOAC Website or
Cannabis_PT@AOAC.org

Time for Questions and Answers



Join us for Future Free Workshops and Webinars!



MEASUREMENT UNCERTAINTY (MU) FOR CALIBRATION LABS

Tuesday, June 18, 2024 - 1:00-3:00pm ET
Free Live Workshop presented by Matthew Sica

EXTERNALLY PROVIDED PRODUCTS AND SERVICES

Tuesday, July 16, 2024 - 1:00-3:00pm ET
Free Live Workshop presented by Matthew Sica, March 25, 2024- 1:00-2:00 pm ET



PJLA

Contact Information

Perry Johnson Laboratory Accreditation,
Inc.

755 West Big Beaver Road, Suite 1325

Troy, MI 48084

Tel: (248)-519-2603

Website: www.pjlabs.com

Email: tszerszen@pjlabs.com

Shane Flynn -AOAC INTERNATIONAL

Email: sflynn@aoac.org



Thank You!

PJLA