AOAC PROGRAM TO DELIVER ANALYTICAL SOLUTIONS FOR ANALYSIS OF CANNABIS AND HEMP

As a global leader in food and agriculture safety standards and analytical methods, AOAC INTERNATIONAL is answering the call of regulators and private sector laboratories to convene experts and approve consensus methods for the analysis of cannabis and hemp in food, feed, plant materials, or other substances of interest to determine the best available science to promote public health.

AOAC launched a new program, Cannabis Analytical Science Program (CASP), in conjunction with the AOAC Midyear Meeting in March 2019, to provide a forum where the science of hemp and cannabis analysis can be examined and for the development and maintenance of cannabis standards and methods. The CASP analytical community comprises government, academic, and contract laboratories; technology providers; private sector organizations; and allied associations.
AOAC Program to Deliver Analytical Solutions for Analysis of Cannabis and Hemp

“AOAC began work on cannabis 2 years ago on an ad hoc basis [see sidebar on AOAC cannabis-related activities],” said AOAC Executive Director David B. Schmidt. “The launch of CASP represents a major commitment by AOAC and the laboratory community to use analytical science to promote public health.”

“Currently, no globally recognized standards and methods exist for validating the safety, potency, and label claims of cannabis products available to consumers,” said Seth Wong, TEQ Analytical Laboratories. “This undermines public confidence and exposes the cannabis industry to risk.”

“As one of the world’s oldest and most trusted leaders in consensus scientific standards for food safety, AOAC is uniquely placed to play a key role,” he added.

Worldwide, more than 50 countries permit regulated medical cannabis. In the United States, 47 states have legalized cannabis in one form or another addressing an adult-use market of 80 million people (New Frontier Data, State of the Cannabis Union, 2019). The U.S. cannabis industry’s projected total market sales are estimated to exceed US $24 billion by 2025 (Forbes, Marijuana Industry Projected to Create More Jobs than Manufacturing by 2020, 2017).

The federal farm bill allows cannabis plants with a low level of THC, but growers, dealers, and processors must register with the state government. Although (medical) cannabis is becoming legalized in many states, many evolving regulatory, law enforcement, and other issues exist surrounding the growing industry. For example, while it’s legal for properly registered people to possess industrial hemp—cannabis with a THC content of 0.3% or lower—it’s still not legal to possess marijuana. Currently, there are no validated methods or rapid field tests that can readily differentiate legally possessed hemp from illegal marijuana. Field tests are available that are reliable enough to indicate a substance is cannabis, but these tests cannot discern between marijuana and industrial hemp.

Further, hemp is a strain of the Cannabis sativa plant that is grown primarily for use in industrial applications. It has been specifically cultivated to produce a low THC content and a high CBD content. The major health qualities of sativa medicinal strains are purported to be anti-anxiety, antidepressant, chronic pain treatment, increased focus and creativity, and increased serotonin (a neurotransmitter involved in the regulation of learning, mood, sleep, anxiety, and appetite).

CBD has good health properties and is being incorporated in dietary supplements, foods, oils, and other products. Growers are compensated by how much CBD is in the hemp plant, so they are trying to grow plants with high levels. However, as CBD levels increase, so do THC levels. THC content cannot be more than 0.3% though. These are just some of the many analytical challenges being faced.

Through CASP, AOAC can provide analytical solutions through a complete and harmonized quality system incorporating all AOAC programs. CASP is a forum where stakeholders can reach consensus on science-based problems, such as product/commodity-specific guidelines, specification, and best practices. In addition to standards that lead to methods, AOAC provides training, proficiency testing, consulting services, sampling plans, validation guidelines, method certifications, publication projects, special meetings, and more. AOAC offers multiple forms of deliverables to meet specific analytical needs.

Initial Focus of Work

Food and Food Products
Consumption of cannabis products is legal and/or becoming legal in a growing number of U.S. states and in Canada. Consumable products include beverages, brownies, butter, chews, cookies, gummies, honey, edible oils, and more. AOAC is beginning the CASP activities with a focus on food and food products. Potential areas for the development of Standard Method Performance Requirements (SMPRs®) and methods include accuracy in label claims and/or residual solvents. SMPRs may address standards for screening methods that may eventually become Performance Tested Methods® (PTMs).

Hemp
With the passage of the Agriculture Improvement Act of 2018 (commonly known as the farm bill), the hemp-derived CBD market is projected to increase from about $591 million in 2019 to $22 billion by 2022. AOAC plans to also focus on development of SMPRs and methods for accurate measurement of CBD in hemp plants, intermediate CBD ingredients, and/or dietary supplements, as well as determination of CBD in pet foods.

AOAC Forms Working Groups on Cannabis
In the initial phase, CASP will leverage AOAC’s stakeholder infrastructure and standards development process to:

Cannabis-Related AOAC Official Methods® and SMPRs®

<table>
<thead>
<tr>
<th>Official Method® 2018.10</th>
<th>Cannabinoid in Dried Flowers and Oil</th>
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<tbody>
<tr>
<td>Official Method® 2018.11</td>
<td>Quantitation of Cannabinoids in Cannabis Dried Plant Materials, Concentrates, and Oils</td>
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<tr>
<td>AOAC SMPR 2017.001</td>
<td>Cannabinoids in Cannabis Concentrates</td>
</tr>
<tr>
<td>AOAC SMPR 2017.002</td>
<td>Cannabinoids in Dried Plant Materials</td>
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<td>AOAC SMPR 2017.019</td>
<td>Cannabinoids in Chocolate</td>
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<tr>
<td>AOAC SMPR 2018.011</td>
<td>Pesticides in Cannabis</td>
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<tr>
<td>Official Methods® and Standard Method Performance Requirements (SMPRs®) are available on e-OMA at <a href="http://www.eoma.aoac.org">www.eoma.aoac.org</a>.</td>
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Join Us

Join AOAC to provide solutions for regulators, industry, and consumers by developing globally accepted consensus-based standards and testing methods for hemp, cannabis, and cannabis-related ingredients/products. Contributors (see below) will participate in the development of standards for hemp and cannabis methods. These standards will then be used by method developers to develop methods, and by AOAC to evaluate methods so that resulting PTMs and OMAs are fully validated to the high standards of AOAC INTERNATIONAL and meet the analytical needs of the community. These AOAC-adopted reference methods will result in reliable data to support effective compliance-driven quality control of products and enhance public health.

For the CASP prospectus, visit www.aoac.org. For more information on CASP, to join a CASP working group, or to become a CASP contributor, contact Scott Coates, senior director, AOAC Research Institute, and CASP Program Lead, at scoates@aoac.org or Tel: 301-924-7077, ext. 137.

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<th>Initial Contributors (June 7, 2019)</th>
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### CASP Pioneers

- ABC Testing, Inc.
- Association of Food and Drug Officials
- Bia Diagnostics
- Bio-Rad
- GW Pharmaceuticals
- Industrial Laboratories
- Materia Medica Labs
- MilliporeSigma
- PathogenDx
- PerkinElmer
- R-Biopharm AG
- SCIEX
- Supra Research and Development
- TEQ Analytical Laboratories
- Titan Analytical
- Trilogy Analytical

### CASP Partners

- CEM Corp.
- CV Sciences
- Eurofins Scientific
- Trace Analytics

### CASP Affiliates

- Charm Sciences
- Crystal Diagnostics
- Hygiena
- Institute of Food Technologists
- Lazarus Naturals
- Medicinal Genomics
- SC Labs