Technical Datasheet

**Analysis Name:** Cannabinoids in Food and Raw Materials by LC-MS/MS

**Method Number:** LI-00.100 (for food/finished products)
LI-00.100_RM (for raw materials)

**Scope of Application:** Finished products containing hemp protein, seed and oil as well as, hemp plant, oil and oil concentrate.
Additional matrix types may be analyzed; however, if they do not meet the acceptance criteria established by the matrices that are validated then the matrix will be considered not compatible with this method or an increased quantitation limit may be reported.

**Description:** An in-house method for the quantitative determination of as many as fourteen (14) cannabinoids in by liquid chromatography tandem mass spectrometry (LC-MS/MS). The procedure encompasses an extraction with acetonitrile. Phase separation is achieved with a mixture of salts. The resulting extract is diluted and centrifuged prior to LC-MS/MS analysis in scheduled multiple reaction monitoring (MRM) mode by electrospray ionization (ESI). Quantitation is performed via external calibration and an internal standard (IS). The limit of quantitation (LOQ) for each cannabinoid may vary based on matrix type.

**Sample Weight Required:** 1 to 100 g, variable depending on matrix type.
Portion received for analysis must be representative of entire sample.

**Analytical Platform:** LC-MS/MS

<table>
<thead>
<tr>
<th>Analyte Reported</th>
<th>Alias</th>
<th>Unit of Measure</th>
<th>Quantitation Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabichromene</td>
<td>CBC</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabichromenic acid</td>
<td>CBCA</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabidiol</td>
<td>CBD</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabidiolic acid</td>
<td>CBDA</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabidivarin</td>
<td>CBDV</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabidivarinic acid</td>
<td>CBDVA</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabigerol</td>
<td>CBG</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabigerolic acid</td>
<td>CBGA</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Cannabinol</td>
<td>CBN</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Tetrahydrocannabivarin</td>
<td>THCV</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Delta9-Tetrahydrocannabivarin</td>
<td>THCVA</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Delta8-Tetrahydrocannabinol</td>
<td>Delta8-THC</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Delta9-Tetrahydrocannabinol</td>
<td>Delta9-THC</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
</tr>
<tr>
<td>Delta9-Tetrahydrocannabinolic acid</td>
<td>THCA-A</td>
<td>mg/kg</td>
<td>0.150 – 10.00</td>
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</table>
### Finished Products (Oils) Containing Hemp

<table>
<thead>
<tr>
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<th>Unit of Measure</th>
<th>Quantitation Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabichromene</td>
<td>CBC</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabichromenic acid</td>
<td>CBCA</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabidiol</td>
<td>CBD</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabidiolic acid</td>
<td>CBDA</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabidivarin</td>
<td>CBDV</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabidivarinic acid</td>
<td>CBDVA</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabigerol</td>
<td>CBG</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabigerolic acid</td>
<td>CBGA</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Cannabinol</td>
<td>CBN</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Tetrahydrocannabinvarin</td>
<td>THCV</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Delta9-Tetrahydrocannabinvarin acid</td>
<td>THCV</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
</tr>
<tr>
<td>Delta8-Tetrahydrocannabinol</td>
<td>Delta8-THC</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
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<tr>
<td>Delta9-Tetrahydrocannabinol</td>
<td>Delta9-THC</td>
<td>mg/kg</td>
<td>0.600 – 40.00</td>
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<tr>
<td>Delta9-Tetrahydrocannabinolic acid</td>
<td>THCA-A</td>
<td>mg/kg</td>
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### Raw Materials-Hemp Plant and Hemp Oil

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<tbody>
<tr>
<td>Cannabichromene</td>
<td>CBC</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabichromenic acid</td>
<td>CBCA</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabidiol</td>
<td>CBD</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabidiolic acid</td>
<td>CBDA</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabidivarin</td>
<td>CBDV</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabidivarinic acid</td>
<td>CBDVA</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabigerol</td>
<td>CBG</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabigerolic acid</td>
<td>CBGA</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Cannabinol</td>
<td>CBN</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Tetrahydrocannabinvarin</td>
<td>THCV</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
</tr>
<tr>
<td>Delta 9-Tetrahydrocannabinvarin acid</td>
<td>THCV</td>
<td>mg/g (%)</td>
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</tr>
<tr>
<td>Delta 8-Tetrahydrocannabinol</td>
<td>Delta 8-THC</td>
<td>mg/g (%)</td>
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<td>Delta 9-Tetrahydrocannabinol</td>
<td>Delta 9-THC</td>
<td>mg/g (%)</td>
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<td>THCA-A</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
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<tr>
<td>Total Potential CBD</td>
<td>N/A</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
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<tr>
<td>Total Potential CBG</td>
<td>N/A</td>
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<td>0.3 (0.03) – 300 (30)</td>
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<tr>
<td>Total Potential THC</td>
<td>N/A</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 300 (30)</td>
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</table>

### Raw Materials-Oil Concentrate

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<tbody>
<tr>
<td>Cannabichromene</td>
<td>CBC</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 900 (90)</td>
</tr>
<tr>
<td>Cannabichromenic acid</td>
<td>CBCA</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 900 (90)</td>
</tr>
<tr>
<td>Cannabidiol</td>
<td>CBD</td>
<td>mg/g (%)</td>
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<td>Cannabidiolic acid</td>
<td>CBDA</td>
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<td>CBG</td>
<td>mg/g (%)</td>
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<td>CBGA</td>
<td>mg/g (%)</td>
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<td>CBN</td>
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<td>Total Potential CBD</td>
<td>N/A</td>
<td>mg/g (%)</td>
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<tr>
<td>Total Potential CBG</td>
<td>N/A</td>
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<tr>
<td>Total Potential THC</td>
<td>N/A</td>
<td>mg/g (%)</td>
<td>0.3 (0.03) – 900 (90)</td>
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</tbody>
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