

How to Determine True THC & CBD Values



Officer Dick Downey's
Re-education Protocol

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How to Calculate Accurate THC & CBD Content in Cannabis Products

You've probably seen the THCa and THC percent values on the labels of your medical cannabis products and accepted them as accurate; however, those values are not completely accurate.

THCa (a = acid), the precursor to THC, needs to be heated (i.e., decarboxylated) to convert to THC, the active form. All cannabinoids occur naturally in their acid forms, that's just how their enzymes make them. The difference between THCa and THC is a carboxyl group. When using cannabis (e.g., smoking, vaporizing, dabbing, etc.), the application of heat removes the carboxyl so THCa gives off CO₂, losing about 12% of its weight in the process. As a result of this difference in mass, you must use a mathematical formula to determine the accurate THC levels in a product.

Let's look at a simple example:

You just bought Maui Wowie flowers with 20% THCa and 5% THC. To determine total THC, you might think that you have to simply add the two numbers to get the total value, or 25% total THC. While that's completely logical, it is not accurate.

To identify the real THC total, you need to consider both THCa and THC, but with a correction factor for THCa before you add in THC, as follows:

$$\text{THC Total} = (\% \text{THCa}) \times 0.877 + (\% \text{THC})$$

0.877 is the molecular mass (mm) of THC divided by that of THCa; this factor boils it down to a simple formula: take 87.7% of the value for THCa, and then add the value for THC.

Here's the real THC total of our Maui Wowie example using this formula:

$$\text{THC Total} = (\% \text{THCa}) \times 0.877 + (\% \text{THC})$$

$$\text{THC Total} = (.20) \times .877 + .05$$

$$\text{THC Total} = 22.54\%$$

To Calculate True CBD Values

This formula also holds true for finding the active CBD total content because CBD and THC have the exact same molecular mass (mm).

$$\text{CBD Total} = (\% \text{CBDa}) \times 0.877 + (\% \text{CBD})$$