



CANNABIS

Product diversification is a key and concerning strategy of today's cannabis industry
From inhalables to edibles, these are some basics and examples of commonly used products

Important Definitions

Cannabinoids

Cannabinoids are a group of naturally-occurring, biologically active chemicals found in cannabis. Some possess psychoactive properties, and many of them bind to or interact with the human endogenous cannabinoid system. Common cannabinoids include:

- **Tetrahydrocannabinol (THC)**, which exists in the plant in a non-psychoactive form called **tetrahydrocannabinolic acid (THCa)**. THCa is converted to its psychoactive form **delta-9 tetrahydrocannabinol (D9THC)** through exposure to heat (e.g., smoking or vaporizing cannabis)
- **Cannabidiol (CBD)**, which exists in the plant as **cannabidiolic acid (CBDA)**; both forms are generally considered to be non-psychoactive
- **Cannabinol (CBN)**, is produced from the degradation of THC

Ratios of Cannabinoids

Historically, typical cannabis flowers had a high THC to CBD ratio, however it has increased substantially from around 14:1 to over 80:1, limiting the potential for other cannabinoids (e.g., CBD) to moderate the adverse side effects of THC. This is primarily due to cannabis being bred over the past few decades to have higher THC content and stronger psychoactive effects. Cannabis products can also be manufactured to have different ratios of cannabinoids with the goal of imparting specific effects on a user.

Terpenes

Terpenes are chemicals that occur naturally in many different types of plants, including cannabis, and are responsible for different aromas. Terpenes, either derived from cannabis, other plants, or synthetically created, are often added to cannabis products to impart characterizing flavors and aromas. Research about the safety of inhaling terpenes is minimal. Some common terpenes include:

- **Limonene**, which imparts a citrus aroma
- **Pinene**, which is responsible for the typical "pine" smell

Cannabis Names

Names used to distinguish different types of cannabis generally do not effectively guide consumers. Strain names, such as Grape Ape or Tangerine Dream, can serve to identify certain flavor characteristics. But some names, like Girl Scout Cookies or Gelato, imply flavor characteristics that are not present.

Inhalable Products

Cannabis Flower

Often called "buds," cannabis flowers (*Figure 1*) traditionally are the part of the cannabis plant that is smoked after it has been harvested, dried, and trimmed. Historically, cannabis flowers had much lower THC content, likely around 4%. In today's market, cannabis flowers generally range between 15%-25% THC in the United States but can exceed 30% THC.



Figure 1

Cannabis Subspecies

Although purported effects are generalizations, the following terms are widely used to describe different types of cannabis:

- **Indica**: typically marketed for sleep and sedation
- **Sativa**: typically marketed for energy and uplifting effects
- **Hybrid**: typically marketed for mixed effects
- **Hemp**: legally defined as cannabis with less than 0.3% THC and typically high in CBD, however hemp-derived concentrates can still have significant amounts of THC

Concentrates

Cannabis concentrates are usually much more potent than cannabis flowers themselves; their THC content can range from 40% to over 90%. They can be purchased in their raw form or in pre-filled vaporizer cartridges (*Figure 2*). Cannabis concentrates are produced through an extraction process using a solvent, or mechanical means, to concentrate plant-derived cannabinoids. The resulting extracts can be used "as is" or further processed (e.g., through distillation) to produce various types of concentrates, usually with elevated THC content.



Figure 2



Figure 3

Budder/butter or wax (*Figure 3*) is named for its consistency and can range from dark brown to bright yellow/blonde in color.

Shatter (*Figure 4*) is brittle and glass-like in texture and appearance but becomes malleable in warmer temperatures. It ranges from dark amber to golden/beige in color.



Figure 4

Distillates are generally produced when a concentrate goes through a distillation process. They are usually clear or slightly opaque, range from very light yellow to dark amber/brown in color, and have a honey or oil-like consistency.

Inhalable Products (cont.)

Ethyl alcohol (ethanol) can be used to make a concentrate that is usually a dark green or tar-colored viscous oil that is lower in THC than concentrates made using other methods, but still contains a variety of active compounds. These “crude” ethanol extractions go by several different names (most commonly **Rick Simpson Oil** or **RSO**), are usually sold in syringes and intended for oral consumption but can be purified using methods like distillation to create products for inhalation. Ethanol can also be used to purify other types of concentrates by dissolving plant waxes through a process known as “dewaxing” or, when done at low temperatures, “winterizing,” in order to increase the percent THC. The appearance of the final purified products can vary.

Carbon Dioxide (CO₂) can be used to extract active compounds from plant material, or to purify other types of concentrates. The appearance of the final product can vary.

Various mechanical or physical methods have long been used to make cannabis concentrates typically containing 40%-60% THC (but can be outside of that range as well). One of the most traditional methods is a dry sifting method using screens that separate the cannabinoid-containing



resin glands from cannabis plant material. The loose glands are called **Kief** and can be pressed to make **Hash** (Figure 5). There are wet sieving methods that use cold/ice water to produce **Bubble Hash** or **Crumble** (Figure 6).

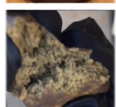


Figure 5

Figure 6

Rosin is made by pressing cannabis plant material between two heated plates. The oil that is expelled from the cannabis under the high pressure is collected and consumed.



Figure 7

Live Resin (Figure 7) can be made using many different extraction methods but refers to the use of cannabis plant material that was immediately frozen after being harvested. These concentrates capture a “from the grow room” olfactory/flavor experience.

Inhalables - Methods of Use

When cannabis is consumed by inhalation the effects are usually immediate, peak within one hour, and then gradually wear off. A variety of approaches or devices are employed for inhaling cannabis smoke or vapor.

Cannabis flowers are traditionally ground up and rolled into a **joint**



Figure 8

(Figure 8) using papers. When cannabis flowers are ground up and wrapped in a tobacco leaf or emptied cigar shell, it is called a **blunt**. Joints and blunts may also contain added cannabis concentrates or use flavored wrappers, especially when sold pre-rolled and ready for use.

Pipes, which are usually made of blown glass, can be used by placing cannabis and/or cannabis concentrates into a chamber called a “bowl” and ignited so the user can inhale the smoke. **Bongs and Bubblers** are types of waterpipes that have chambers filled with liquid that cools the cannabis smoke as it passes through while the user inhales.

Vaporizers heat concentrates, such as distillates or wax, and/or cannabis flower to a temperature that turns the cannabinoid-containing oil/resin into a vapor that is inhaled by the user. Vaporizers can be portable memory stick like devices or pen-like devices (Figure 9), sometimes called **wax pens**, or can be larger table-top vaporizers.



Figure 9

Dabbing refers to a method of vaporizing or combusting cannabis concentrates. Generally, a “dab” of cannabis concentrate is applied to a glass, metal, or ceramic “nail” that has been heated with a torch. A “dab rig” (Figure 10) houses the “nail” and the user inhales the resulting smoke/vapor. Dabbing results in a rapid, intense high and can cause adverse side effects in novice users.



Figure 10

Orally-Consumed Cannabis Products

Edible Cannabis Products

When conventional foods are infused with cannabis they are referred to as edible cannabis products or edibles. Candies and baked goods are the most well-known types of edibles, however cannabis-infused drinks (“cannapops”), sauces, cheeses, salad dressings, and even pre-made frozen foods are sold legally in some places (while prohibited in others).

The effects of an edible cannabis product can be felt within 30 minutes post-consumption, but usually take more than an hour to kick in. For this reason, it is very important that users wait 2 or more hours after their initial dose before consuming any more cannabis. Novice users should start with half of the suggested dose to avoid symptoms of over-intoxication.

Tinctures

Tinctures (Figure 11) are cannabis-infused solutions, derived either directly from the cannabis plant or from a cannabis concentrate. They are typically made using ethanol, glycerin, or vegetable oils. Tinctures are usually consumed by mouth but can also be applied to the skin. Their effects can be felt immediately or after 1-2 hours, and generally last longer than inhaled products.



Figure 11

Other Cannabis Products

Topicals



Figure 12

Cannabis-infused topical products (Figure 12) can include creams, lotions, ointments, or balms that are applied directly to the skin. These are intended to provide relief at a targeted area of the body.

Transdermal Patches and Suppositories

Transdermal patches are applied to the skin and intended to deliver cannabinoids into the circulatory system. Suppositories are administered rectally or vaginally. These forms are less common than the other products listed but can be effective routes of administration for certain people.