



AMERICA'S HEMP
ACADEMY

Welcome: Our Mission and Message

Our mission at America's Hemp Academy is educating the industry leaders of tomorrow, bringing families back to the farm and achieving sustainability for the future of farming.

America's Hemp Academy prepares future leaders of the hemp industry through education and hands-on learning. We want to help revive farms around the globe by bringing the next generation back home. Through our situation-specific and decision focused course, we strive to help our students reach sustainability for the future of their operations.

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America's Hemp Academy

Monday	Tuesday	Wednesday	Thursday
Welcome Introduction of Hemp Plant Morphology Plant Identification Basic Genetics Hemp Lifecycle Nutrition and Fertilization Soil Testing Nutrient Deficiencies Seeding Basics Management Essentials Weed Control Pest/Disease Control Water Management	Products/Processing Hempcrete Textiles and Fabrics Cannabinoid Introduction Extraction Methods Food Production Laboratory Visit	Principles of Interior Floral <ul style="list-style-type: none"> • Greenhouse • Lifecycle • Maintenance Principles of Exterior Floral <ul style="list-style-type: none"> • Planting Options • Seed Propagation • Harvesting Options • Conditioning Principles of Fiber Principles of Grain Planning for your Operation Field and Greenhouse Visit	Licensing Contractual Agreements Sourcing Seed Banking Insurance Testing Laboratories Record Keeping Chain of Custody Understanding Regulations Marketing Extended Resources Knowledge Check AHA Completion Social Event

*Timing changes in the curriculum will be made to accommodate for guest speakers and classroom activities. *





















Hemp Products

Fiber Based Products:

Animal bedding - Hurd

Canvas - Bast

Cardboard - Stalk

Cellulose Ethanol - Stalk

Chemical Absorbent - Hurd

Fiber board - Hurd

Hempcrete - Hurd

Insulation – Hurd

Kitty Litter – Stalk

Paper - Stalk

Rope - Bast

Textiles - Bast



Grain Based Products:

Animal Feed – Cake

Bio-diesel - Oil

Bread - Nut

Body Products and Cosmetics - Oil

Cereals – Nut

Cookie Dough- Cake

Flour – Cake

Ink - Oil

Paint – Oil

Pizza Crust – Cake

Protein Powder – Nut / Cake

Salad Dressing - Oil

Varnish - Oil



Floral Based Products:

Balms and Salves

Bio – Pharmaceuticals

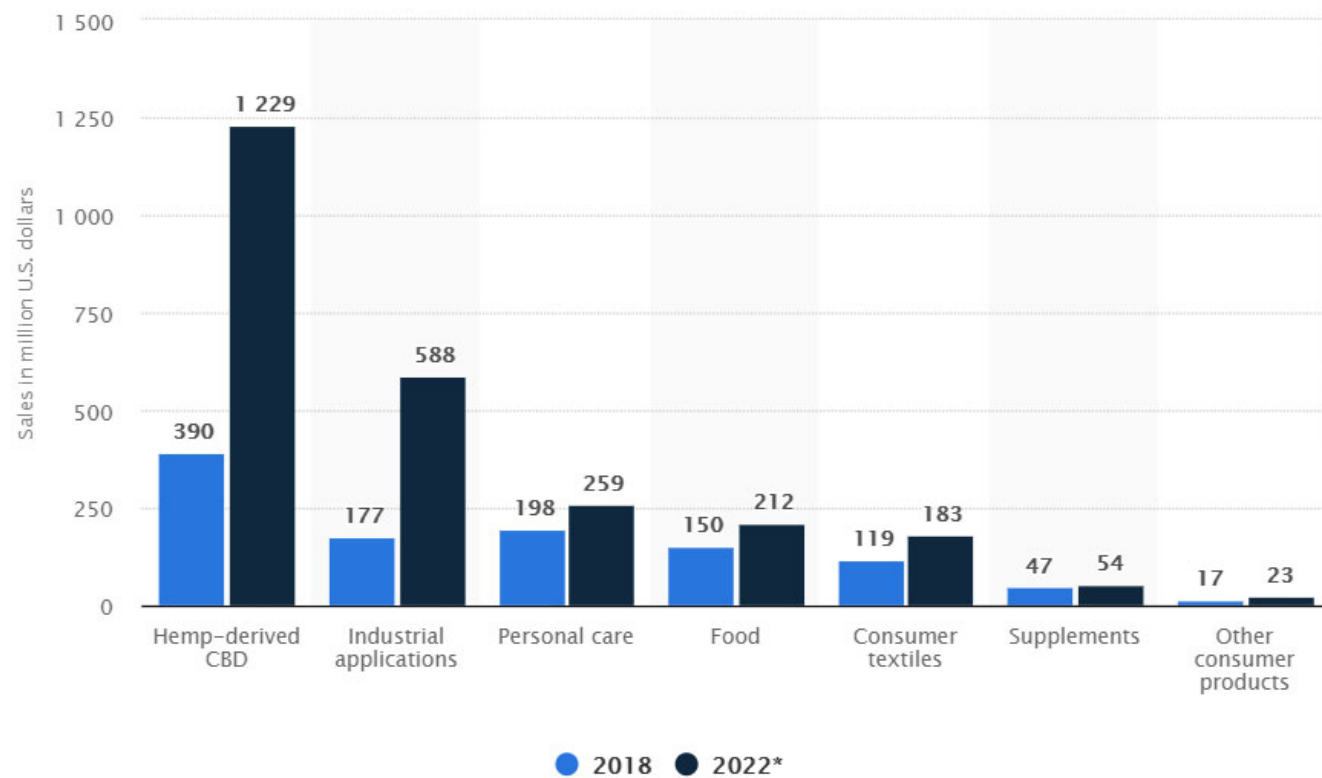
Micro – Doses

Tinctures

Transdermal Patches



Sales of hemp-based products in the United States in 2018 and 2022 by product category (in million USD)



© Statista 2020



Hempcrete



Benefits of Hempcrete

Multiple design options

- Pre - cast modular
- 3D printing
- Slip form
- Interlocking blocks

Insulation value = R 2.0 – 2.5 per inch

Eliminates the vapor barrier challenge

Bonds well to studs (airtight seal)

Fireproof (fire-stops not needed)

Good acoustic insulation

No toxic outgassing

Black mold and dry - rot resistant

Resistant to mice and other pests

Self-healing when cracked

2000 – 6000 PSI depending upon binder

Negative carbon footprint





Hempcrete in the AHA Lab

Mixing Steps: (1) Hurd and Water, (2) Lime, (3) Remaining Water

Ratio (by volume) of Individual Products:

4 Parts Hurd/ Shiv

1 Part Water

1 Part Lime

Hemp Bedding Litter Bioplastic

- Hemp Bedding & Litter
 - High absorbency
 - Microbe suppression
 - Can be pelletized (kitty litter) or loose
- Bioplastics
 - Can be produced from seed hulls or stalks
 - Suitable for existing injection and blow-mold machinery
 - Biodegradable at various time frames depending upon formulation
 - Low toxicity
 - Do not deplete petroleum resources



Hemp Plastics



- Can be completely biodegradable and recyclable
- Produced solely using cellulose extracted from hemp which eliminates the need for petroleum and therefore toxicity during manufacturing
- Carbon negative
- Strength of hemp plastic makes it suitable for many industries. Has a high ratio of density to weight which will save weight on heavy structures.
- More expensive and labor intensive compared to petroleum processes
- Toughness, flexibility, and safety compared to conventional plastics make hemp plastic an attractive alternative.



Textiles and Fabrics

Hemp fibers are porous, allowing good airflow and wicking away moisture. The fiber also softens with age and is both odor and mildew resistant. This makes hemp an excellent fabric for shirts, carpets, towels, etc. Durable and eco-friendly.



Health and Beauty



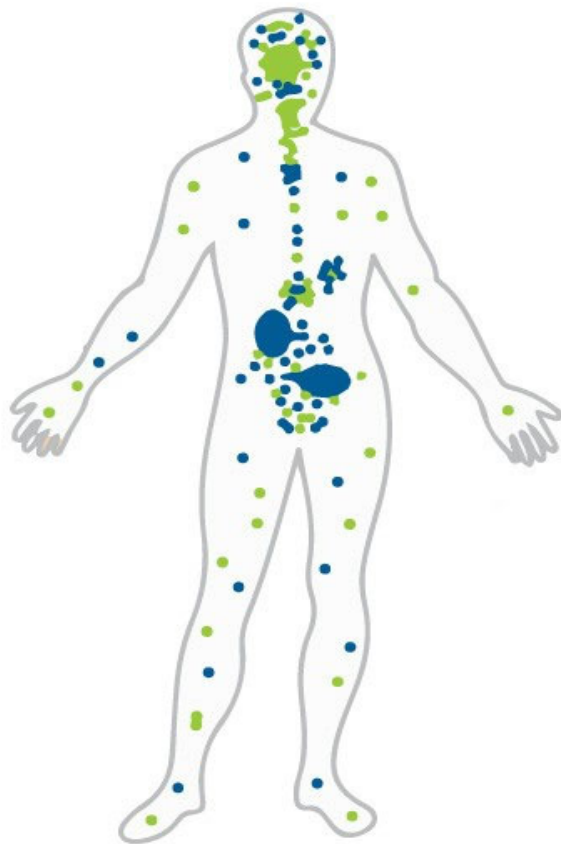


- There are two major types of hemp oil, one from the seed, which is used for cosmetic and beauty purposes and the other from the floral bud, which is extracted for its medicinal value.
- Seed oils are potent skin moisturizers with mild healing properties and are used in a wide variety of body products.
- Floral oils, cannabinoids extracted and refined by various methods, offer a rapidly developing array of medicinal benefits. Four such products have already been approved as drugs by the FDA which has fast-tracked approval of cannabinoids proven safe and showing significant medicinal promise.

Extraction Methods

- **Ethanol** – A popular extraction method, easy and inexpensive but resulting in dark oil with bitter and grassy flavor which must be refined out before the product is usable. Produces a lower-quality cannabinoid product
- **Hydrocarbon** - A somewhat harsh extraction method typically using certain components of gasoline to extract the cannabinoids. To obtain a reasonably pure product the hydrocarbons must be distilled away completely.
- **CO2** - Similar to techniques used for decaffeinating coffee CO2 extractions can, with care, retain the essential oils, terpenes, and other sensitive chemicals within the plant. Most commonly however, high pressures and temperatures damage most terpenes and heat sensitive chemicals but extract much larger molecules such as lipids (omega 3 and 6), chlorophyll, and waxes.
- **Steam** – Completely non-toxic system for gentle and high-quality extraction of all cannabinoids and terpenes. The only extraction not requiring subsequent refinement of the oils.





CB1 – Green: Central Nervous System
CB2 – Blue: Immune System

Endocannabinoid System

- Series of receptors throughout the body; the two main types are CB1 and CB2.
- The ECS main functions are maintaining homeostasis and helping in recovery due to stress. This can include reducing blood pressure, body temperature, pain and fear perception, regulate muscle tension, and stimulate appetite.
- Cannabinoids interact with both immune and nervous systems, improving the efficiency and function of both, and facilitating their effective interaction to the benefit of both human and animal health.
- Cannabinoid receptors are found in the brain but not in the brainstem.

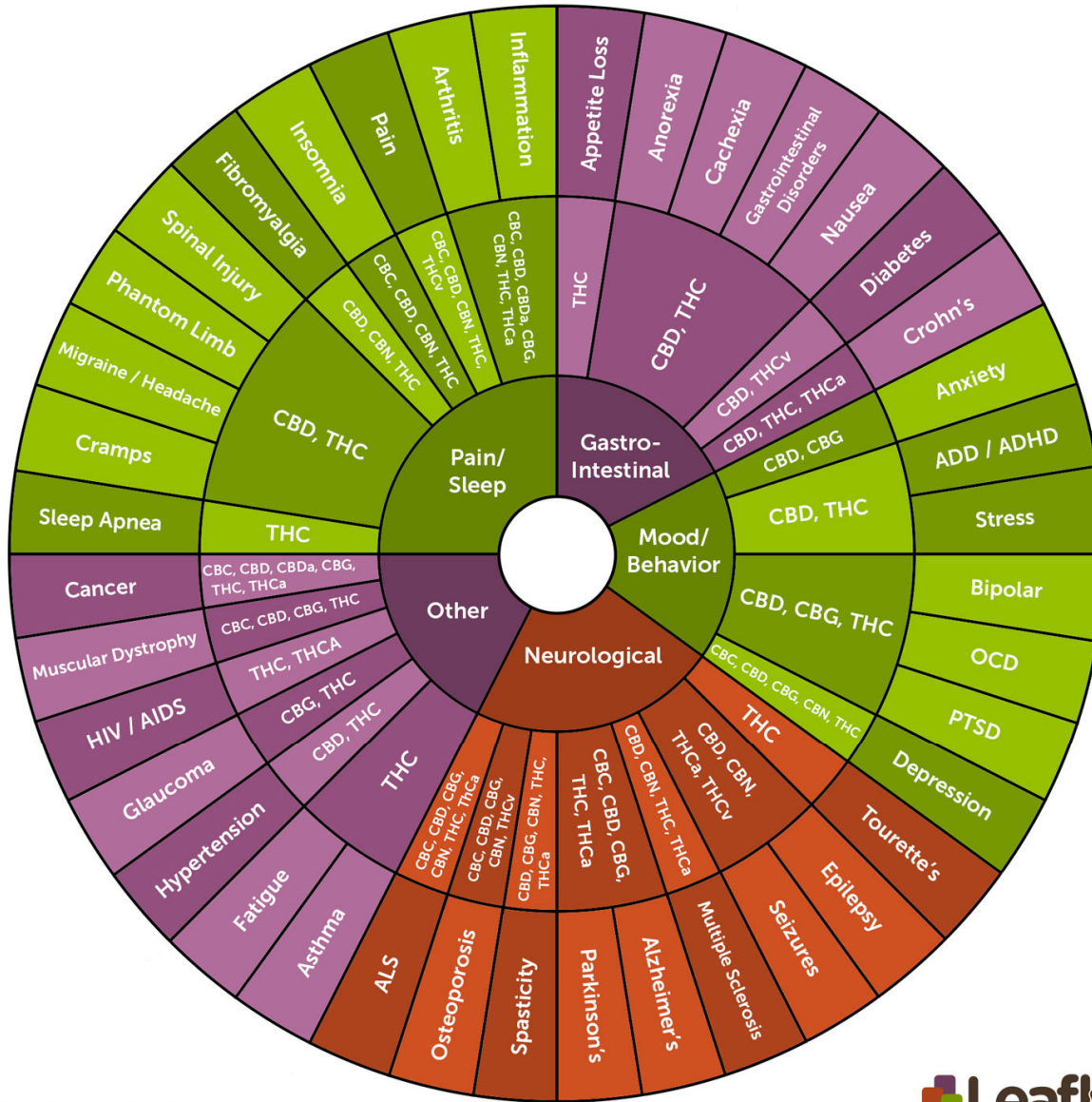
8 Major Cannabinoid Acidic Precursors

- **Cannabinoid Acidic Precursors**

- Precursors or parent cannabinoids are the cannabinoid acids that are synthesized through decarboxylation to create compounds such as THC and CBD. Decarboxylation occurs through heat, converting the cannabinoid from an acid to a neutral.
- **CBGA** (Cannabigerolic acid)- Cardiovascular disease, metabolic disorders, colon cancer
- **THCA** (Δ^9 -tetrahydrocannabinolic acid)- Anti-inflammatory, neuroprotective, anti-emetic
- **CBDVA** (Cannabidiolic acid)- Anti-inflammatory, antidepressant, anticonvulsive
- **CBCA** (Cannabichromenonic acid)- Anti-inflammatory, antifungal, cancer fighting
- **CBGVA** (Cannabigerovarinic acid)
- **THCVA** (Tetrahydrocannabivarinic acid)
- **CBDVA** (Cannabidivarinic acid)
- **CBCVA** (Cannabichromevarinic acid)

- **Plant Cannabinoids**

- **CBG** (Cannabigerol)- Reduces intraocular pressure, antibacterial agent, neuroprotective
- **THC** (Δ^9 -tetrahydrocannabinol)- Mental illness, neurological disorders, anti-emetic
- **CBD** (Cannabidiol)- Epilepsy and seizure disorders, neurological disorders
- **CBC** (Cannabichromene)- Skin diseases, mental illness, anti-inflammatory
- **CBGV** (Cannabigerivarin)
- **THCV** (Tetrahydrocannabivarin)- Regulate blood sugar, bone growth, mental illness
- **CBDV** (Cannabidivarin)- Appetite suppressant
- **CBCV** (Cannabichromevarin)





Food Production

Hemp Oil Extraction With Cold Presses









Questions?

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Thank you!