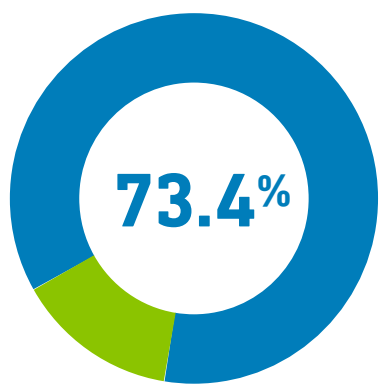




**Raise a glass to
process-efficient
hop and beer
flavor solutions
that can improve
your beer yield**

Craft refreshingly authentic flavor profiles with ease

Brew beyond boundaries with ADM’s wide range of natural liquid hop extracts, oils, and innovative production capabilities. With our integrated hop platform and Totally Natural Solutions as our global center of expertise for hops and brewing, we deliver the technical expertise and product variety you need for more production-efficient, convenient, and on-trend beer and beverage development. Read on to learn how you can improve your beer yield by up to 10% using hop extracts as compared to brewing with hop pellets.

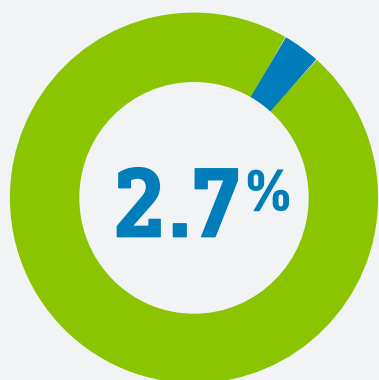


Beer makes up 73.4% of the volume of all alcoholic beverages in EMEA¹

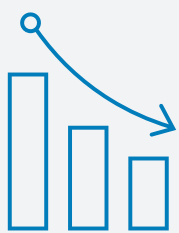


¹ Euromonitor, June 2023

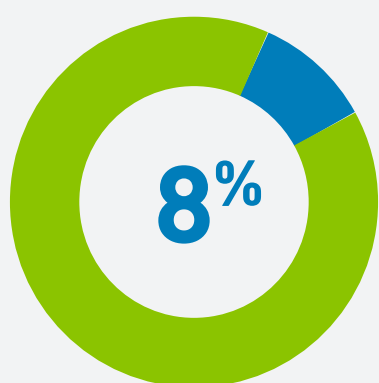
Flexible, innovative solutions for your brewing challenges



Forecasted growth of **non/low-alcohol beer volume** from 2023 to 2024¹



40% of European and 48% of Nigerian Millennial and Gen Z consumers have **reduced** their **alcohol intake** in the past two years²



Increase in European **craft beer demand** in 2022³

From increasing consumer demand for low- and non-alcoholic beers to technical process hurdles, today's brewers face a number of considerations. With ADM, we've got the **technical expertise and high-quality ingredients** you need to increase your brewing efficiency by improving your beer yield up to 10% as compared to brewing with hop pellets and conveniently develop the beverages your consumers are thirsty for.

The continued rise of craft and low/non-alcoholic beers

More consumers are reaching for beers and other beverages with low or no alcohol content, but still want authentic taste — especially amidst the love for hop-heavy craft experiences. ADM's hop extracts and oils not only help you create the flavor and aroma of lager, IPA, NEIPA, ale, and other beer styles, but offer unlimited possibilities for exciting new innovations in other beverage categories.

Solving for technical brewing challenges

Flexibility and consistency are key to successful brewing, enabling space for both creative exploration and a more brewing-efficient, reliable brewing process. Bypassing the challenges of working with whole hops or hop pellets, our convenient hop extracts and oils help you achieve true hop aroma, enhance body, refine non-alcoholic options, and increase your beer yield up to 10% as compared to brewing with hop pellets.

¹ Euromonitor, June 2023

² ADM Consumer Study, Alcoholic Beverages; February 2024, Europ (GER, UK, ES, IT, PL); Africa = Nigeria; n = 400 per country

³ Mordor Intelligence

High-quality beverages. Flexible and higher-yielding brewing.

With ADM's easy-to-use liquid hop extracts and oils, you'll be able to create authentic flavor profiles with less beer loss and up to 10% more beer yield than using whole hops or hop pellets. Discover the benefits of our hops and beer flavor solutions and explore our full portfolio of offerings.

Why choose hop extracts from ADM?

Learn how we can help streamline your production and enhance beverage innovation with our broad selection of hop oils, extracts, blends, and more.

Hop Replacement Offerings

Fully or partially replace kettle, whirlpool, and dry-hop additions, cutting down on filtration times

Improved Margins & Reduced Costs

Up to 10% better yields and decreased transport and storage costs as compared to brewing with hop pellets

Premium Ingredients

Improved beer quality from sensory to shelf stability thanks to our high-quality ingredients derived from nature

True-to-Type Hops

Consistent true-to-type hop experience delivered throughout the year

Consistent Flavor & Tailored Profiles

Greater consistency and more stable hop character over time with various sensory profiles tailored to specific applications or beer styles



Flavor With No Hop Creep

All the intensity of a high dry-hop load with no risk of re-fermentation or hop creep compared to whole cone pellet hops

Process Flexibility

Virtually limitless possibilities to experiment and develop truly unique and unforgettable brews

Head-to-head analysis: brewing with hop extracts vs. traditional hop pellets

To compare American-style pale ale brewed with hop extracts versus traditional dry hopping with pellets, our hop platform experts conducted a study using the same hop varieties in extract and pellet form and identical brewing processes up to the dry-hopping stage.



Beer brewed with **hop extracts** resulted in a **10% increase** in beer yield



The ask

Brew a pale ale with comparable aroma and conduct a full substitution of dry pellets with hop extracts.

The challenge

Create the flavor, aroma, and bitterness of an American-style pale ale.

The results

Compared to the batch brewed with T90 hop pellets, the beer produced using hop extracts was nearly identical in aroma, flavor, and bitterness profile. And better yet: the study showed increased **process efficiency with 10% higher beer yield, cost reduction, and profitability** potential when brewing with **hop extracts** as compared to brewing with T90 hop pellets.

Beer brewed with...

HOP EXTRACTS

- ▶ **No filtration required** — extracts are fully soluble
- ▶ **Complex flavor profiles**
- ▶ **Lower haze** with more stability
- ▶ **10% increase in beer yield** due to eliminating loss from pellet absorption and filtration

T-90 HOP PELLETS

- ▶ **Required filtration** to remove residual hop particulates
- ▶ **Complex flavor profiles**
- ▶ **Higher haze**

ADM's portfolio of hop oils, extracts, and more

Hop Oils*

Standardized hop oils that offer a concentrated non-varietal and true-to-type hop aroma and flavor. Add during or after fermentation.

- ▶ Adds authentic hop flavor and **aroma**
- ▶ Can **increase brewing efficiency** and **capacity** compared to traditional hop pellets
- ▶ **Retains volatile component** and **hop character** of variety



Hop Compositions*

Soluble hop fractions. Add during maturation or in the bright beer tank.

- ▶ **Enhance** the **late-hop character** in Lager, IPA, or NEIPA-style beer formulations
- ▶ Modify the **taste of low and non-alcoholic beers** to improve issues commonly associated with low-alcohol and/or low-carbohydrate beers
- ▶ Elevate sensory attributes like **top notes** and **mouthfeel**



Varietal Hop Oils*

Standardized hop oils that offer a concentrated varietal hop aroma and flavor. Add during or after fermentation.

- ▶ Adds authentic hop flavor and **aroma**
- ▶ Can **increase brewing efficiency** and **capacity** compared to traditional hop pellets
- ▶ **Retains volatile component** and **hop character** of variety

Natural Bittering Agent

Isomerized hop extract. Add during the kettle stage, during maturation, or in the bright beer tank.

- ▶ Provides a standardized **bittering effect** to beer and other beverages

Hop Flavors

Combinations of the best hops and fruit in one easy-to-use solution. Add during maturation or in the bright beer tank.

- ▶ Maximize **taste** and **aroma intensity** of fruit-forward beers, cocktails, and beer mixes
- ▶ Eliminate the need for fruit or botanical preparation and contain no fermentable sugar
- ▶ Provide **consistent flavor** profiles

*Diluted in propylene glycol for easier use and better dosage

Filled to the brim with possibilities

With our premium hop products and deep-rooted technical brewing expertise, ADM can help you leverage your potential in crafting refreshingly authentic profiles in a more process-efficient, creative, and convenient way. Our products and capabilities offer:

- ▶ **Increased production efficiency in brewing** through a 10% increase in beer yield, reduced hop bills, and lowered transport and storage costs
- ▶ **Process flexibility** to seamlessly enable downstream diversification and create multiple beer styles from a single stream
- ▶ **Precise control** over alpha acid levels to achieve consistent, true-to-type hop experiences year-round with easy recipe replication
- ▶ **High-quality results** with improved storage stability and maximized hop flavor and aroma intensity



Ready to crack open the possibilities of an enhanced brewing operation?

Whether industrial or craft, discover how ADM and our expert support team can help you develop the hop and beer flavor solutions your customers are thirsty for.



Contact us

For a technical consultation:

844-441-FOOD | breeze.outhwaite@adm.com

ADM hop and beer flavor toolbox:

adm.com/HopsAndBeerFlavors