

# POURING INNOVATION: THE SCIENCE BEHIND UNLOCKING ALMONDS' BEVERAGE POTENTIAL

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Almond beverages are no longer just a substitute for cow's milk—they've become a versatile, functional foundation for a new generation of drinks. As plant-based consumption accelerates and functional drinks continue to gain traction, almond-derived ingredients such as almond milk, almond protein, almond butter, and finely milled almond flours allow brands to deliver on consumer demands for improved nutrition, better mouthfeel, and on-trend claims like "plant protein," "barista-friendly," "clean label," and "source of fiber."

## THE MARKET LANDSCAPE FOR ALMOND DRINKS

Almonds are gaining momentum across multiple beverage categories thanks to their mild flavor, "good" unsaturated fats (one serving of almonds (28g) has 13g of unsaturated fat and only 1g of saturated fat), and naturally clean-label positioning. In plant-based milks used as coffee shop alternatives, they offer the creaminess and frothability consumers expect in espresso and cold-brew applications. Shelf-stable RTD coffees and creamers also benefit from almond-based systems that remain rich and stable without separating over time. In addition to their barista benefits, almond ingredients are expanding into both dry-mix and ready-to-drink protein shakes, where almond protein helps meet rising demand for non-soy plant protein solutions. In smoothies, retorted high-protein shakes, and meal-replacement formats, almonds contribute calories, fats, protein, and a flexible flavor base that integrates seamlessly with almost any added ingredient.

## ALMOND INGREDIENT FORMS AND FUNCTIONS

A broad portfolio of almond fractions can support diverse beverage needs, each with unique strengths.



**Almond milk**—produced as a liquid extract with low solids—serves as a light, clean-tasting base.



**Almond protein powders and defatted almond flours** offer higher protein for nutrition claims, but they generally require hydrocolloids to keep them suspended and prevent beverages from separating.



**Almond butter and paste** supply fat, body, and indulgent mouthfeel, making them a perfect ingredient for premium smoothies and creamer applications.



Super-fine **almond flour** adds fiber and texture economically, especially when grit-free milling is used.



**Almond oil** contributes to flavor and mouthfeel enhancement, especially in emulsified RTD formats where proper fat integration is critical for sensory quality.

cold-filled formats rely on preservatives or strict refrigeration. As consumer expectations for plant-based milks rise—especially for higher protein and fiber levels—formulators will face new challenges incorporating and suspending greater amounts of almond protein without compromising drinkability. Almonds, however, remain an excellent and adaptable starting medium, and R&D teams can continue leveraging industry tools to create new functional formats.

## TECHNICAL CONSIDERATIONS

Formulating almond beverages requires careful management of the nut's functional characteristics to ensure stability, safety, and high sensory performance. Suspension is a major challenge since almond particulates tend to settle without proper hydrocolloids—ingredients like gum acacia, xanthan, locust bean gum, modified (and/or natural) starches, and sunflower lecithin help maintain a smooth, uniform drink even at higher almond flour levels. Flavor management is equally important. Almonds blend naturally with mainstream flavors like vanilla, chocolate, and coffee, but formulators must protect almond fats from oxidation, which can introduce off-notes. Strategies include using antioxidants (tocopherols, ascorbic acid), reduced-oxygen headspace, and robust thermal treatments such as High-Temperature, Short-Time (HTST), Ultra-High Temperature (UHT), or aseptic processing, with peroxide values monitored during shelf-life.

Almond proteins can precipitate at low pH, so acidic beverages require acid-stable stabilizers, emulsifiers, or microfiltration to maintain stability. While almonds sold in North America undergo mandatory pasteurization, shelf-stable beverages must still be UHT processed;



## PRACTICAL ADVICE FOR FORMULATORS

Developing successful almond-based beverages requires creative formulation and attention to almond-specific behaviors. Sensory testing should begin early and remain ongoing, as flavor stability and texture can shift during storage. Particle size is also critical; microgrinding reduces grittiness and improves suspension, creating a smoother drinking experience. In addition to particle size, thermal processing and packaging choices play a major role in longer shelf life or milder heat treatments for refrigerated products, regardless of selecting HTST or UHT with oxygen-barrier packaging.



**Almonds' neutral flavor can soften and balance more polarizing plant proteins**, improving the taste of mixed-protein beverages without lowering protein content.



Almonds are uniquely positioned to grow across beverage categories: they **offer familiarity, clean-label appeal, functional versatility, and broad flavor adaptability.**

Their adaptability to a wide flavor palette makes them ideal for both classic and unconventional beverage innovations—beyond vanilla and chocolate, they pair well with matcha, caramel, spices, fruit purees, and more. Inspiration can also be drawn from the almond protein bar market, which is packed with creative flavor combinations easily transferrable to beverages.

With the right protein treatments, stabilizers, and processing strategies, almond ingredients can power differentiated, on-trend beverages across shelf-stable, refrigerated, ready-to-drink, and café formats—helping drive the next wave of innovation in plant-based drinks.

