



# Formulating with Almonds

## Key Development Considerations for R&D

More people today are snacking through their mealtimes rather than sitting down to three square meals per day, and this style of consumption has fueled the growth of snack products that span the spectrum of dayparts and snacking occasions. Healthful ingredients like almonds within innovative, tasty products can check multiple boxes for consumers seeking “free-from” labeling, clean nutrition and smart indulgence throughout the day. New snacking formats offer multiple ways for food manufacturers to deliver products aligned to popular food trends such as Whole30®, keto/high-fat, low-carbohydrate, vegan and plant-based diets.

Almonds contain no added sugar, deliver a clean ingredient label, and with multiple forms, they can be used to create a wide variety of innovative snacking products. Those products can be made difficult for competitors to match when different almond formats are combined under the “almonds” umbrella on a nutritional label. And of course, almonds’ universal flavor plays well with the other ingredients commonly found in the R&D toolbox. With almonds as the core base ingredient, developers can tap into emerging trends like savory bars that may have cheese, onion, garlic, and spices like cumin, oregano, rosemary, and thyme. And each almond form can help achieve a uniquely textured product; whether working with blanched flour, roasted butter or whole natural almonds. This article will explore emerging and established almond forms, storage and shelf life, and opportunities for healthy nutrition with almonds.



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## Versatile Forms for Endless Product Development

Almonds come in various functional formats that aid developers as they seek to create and update different products with the same ingredients. Almond butter and flour are extremely useful for food formulators, given the huge popularity of nutritional bars, protein shakes, and gluten-free baked goods. Formulators can use any of the 14 almond forms, like sliced, diced, whole and slivered, to provide various textures and visual appeal.

Almond flour is an ideal ingredient to create gluten-free dry-cake and cookie mixes. Blending the almond flour carefully with the other dry-mix ingredients, at the right ratio, can separate the almond particulates from one another so that they don’t turn into almond butter in the box. Other uses for almond flour include coatings for snack bites or to give bars and baked goods a gluten-free density.

Almond butter can be used as a dip, spread or filling to various snacks. Product manufacturers can also use almond butter as a binding ingredient in baked snack bars that require pliability and a chewy texture.

Both almond butter and flour come in blanched and unblanched options as well as roasted or natural. A chocolate snack bar may use unblanched almond butter, while a lemon-flavored bar may use

blanched flour to allow the lemon-yellow color to shine through. In dry-protein drink mixes, almond flour brings thickness and mouthfeel, allowing the developer to eliminate instant starches and gum thickeners that could add unwanted processed carbohydrates or result in a seemingly “unclean” ingredient label.

Get creative and use multiple forms in one snacking product. For extra crunch, texture, and particulate visual appeal, almond formats such as diced, sliced, and slivered can be incorporated in the same products that use almonds as a base. For instance, a gluten-free cookie made with almond flour that has slivered almonds on top provides both the gluten-free flour base and a crunchy, visually salient topping.

## The Next Frontier of Forms

While the most commonly used almond forms are whole, sliced, diced, butter and flour, there are now fractionated almond powders whose fat is manually pressed out, leaving behind a high protein powder that is 15 percent fat, 50 percent protein and 22 percent fiber.

Almond protein powder is a functional ingredient that helps formulators get more plant-based protein into their finished products without all the fat. At high levels, that fat can harm overall shelf stability due to oil seeping out or higher rates of rancidity.

## Almond Roasting and Shelf Life

In their natural form, almonds have a mild flavor that can be blended with both sweet and savory applications. That’s because almonds have a unique ability to complement, rather than interfere, with other dominant flavors. They don’t cover up delicate fruit or vanilla notes but allow them to shine through while still enhancing the overall flavor profile.

When almonds are air- or oil-roasted, the enhanced buttery flavor brings a whole new dimension to the product. In applications, with exotic spice blends or seasoned nut mixes, the roasted component can yield ethnically authentic flavors.

Almonds are a relatively low-moisture, high-oil nut that has a long shelf life when handled appropriately. Almonds that are blanched, diced, or sliced have greater exposure to oxygen, so they’ll oxidize quickly if not handled properly.

Manufacturers should store almonds at less than 65 percent humidity and less than 50°F for a two-year shelf life. If the nuts are roasted, they should be stored vacuum-packed or nitrogen-flushed until used in production. Finished almond-based products should be packaged in foil-lined wrappers that keep out both air and light.

Nuts that are caramelized in sugar, and bars that are enrobed in chocolate (sugar-free or very dark), have a longer shelf life than noncoated versions. Almond snacks also can include natural vitamin E or other herbal antioxidant extracts (like rosemary or oregano) to slow down oxidation.

## Nutrition

Food formulators must be creative when trying to eliminate gluten from baked goods and minimize processed carbohydrates like sugar and maltodextrin, in order to meet the demands of macronutrient market trends. It’s no small challenge, especially as you also aim for a clean label of ingredients that consumers easily recognize by name.

Protein is an essential nutrient that helps build and preserve muscle, bone, skin and nails, and also helps keep you feeling full and satisfied. This nutrient has continued to grow in popularity as various eating habits like Keto and plant-based continue to stay on trend.

Plant-based foods, such as nuts, beans, grains, rice, vegetables and legumes are “incomplete” proteins, because they are missing one or more of the nine amino acids<sup>1</sup>. The amino acids most limited in plant proteins are lysine, methionine and cysteine. To create a complete protein, you need to combine complementary plant-proteins<sup>1</sup>. Almonds are high in amino acids that legumes and pulses lack – so combining these two ingredients will create a complete protein.

As an ingredient, California almonds bring a high level of nutrition, function, and flavor to product developers. Product manufacturers can use almonds to achieve various textures all while boosting the finished products’ nutritional value with healthy fats, fiber, and protein. As snacking formats and preferences continue to change over time, California almonds remain a smart, strategic ingredient choice that continues to be in-demand and applicable to any type of product or snacking occasion.

### References

1. James D. House, J.D., Hill, K., Neufeld, J., Franczyk, A., Nosworthy, M.G. (2019). Determination of the protein quality of almonds (*Prunus dulcis* L.) as assessed by in vitro and in vivo methodologies. Food Science & Nutrition, DOI: 10.1002/fsn3.1146.