



Powering Plant-Based Innovation with California Almonds

Formulating with Almonds for Complementary Plant Proteins



CHEF CHRISTINE FARKAS
Founder of IHeartFood Consulting

To say that protein is having “a moment” is something of an understatement. This is being driven by consumer desire for health, sustainability and ethics, which has seen a boom in cleaner living, which so often goes hand in hand with the consumption of alternative proteins, including plant-based foods and beverages. In fact, according to Innova Market Insights, in the last five years, there has been a 57% annual growth in food and beverage launches featuring plant-based claims.¹ With demand showing no sign of slowing, developers must continue to find new ways to innovate in order to change the perception of plant-based products through high-impact ingredients and their forms.

Chef Christine Farkas, product developer and founder of IHeartFood Consulting, develops concepts with a focus on nutrition. She says, “Almonds are one of the key ingredients I rely on when formulating for a range of consumer needs. With 6 grams of protein per 30g serving, almonds can offer the missing link to build complete proteins for plant-based meals. Many plant-based proteins are low or missing one or more of the amino acids to qualify it as a ‘complete protein’, but pairing plant proteins with opposing – or complementary – amino acid profiles still creates a full protein.”

“Combining complementary plant proteins through mixing, cooking, baking, or blending the ingredients in their widely available and diverse forms makes it more accessible to supply the protein quantity and quality desired and we’re seeing this becoming more important to consumers today.”

“Almonds, with an extensive portfolio of formats available including whole, sliced, slivered, milk, butter, flour, ground, and oil, means there is no end to the ways in which developers can ideate innovative food products that meet consumer desires in exciting and new ways. Plus, almonds fit within a variety of lifestyles, such as vegan, vegetarian, GMO-free, gluten free, dairy-free, keto, paleo, Mediterranean, flexitarian diets, to name a few.”

“There are many ways to use almond ingredients in applications to achieve sensory and nutrition targets. Almond butters, which are available roasted and unroasted, add a rich and flavorful profile to soups, sauces, and baked applications.”



“Almond milk, available in sweetened and unsweetened as well as fortified, is a neutral base for beverages, smoothies and sauces. Sliced, slivered, and whole almonds, can be toasted or untoasted and add an array of texture and color contrasts in baked goods, tossed into salads, as garnishes for soups or enjoyed straight up for snacking on the go.”

“Almond protein powders are protein dense and add a neutral, yet slight nutty flavor in beverages and energy bars, which is ideal for these categories.”

“On the nutrition side, almonds continue to be a value-add ingredient that resonate with evolving preferences, giving packaged goods a healthy-halo without sacrificing on taste or nutrition. Per 30g serving, almonds provide 14 grams of good unsaturated fat, only 1 gram of saturated fat and 4 grams of fiber, leaving consumers with that satisfied feeling that may otherwise lack with less nutrient-dense options.”



By getting creative with almond forms from spreads to butters to sliced, slivered and more, almonds help enhance the multi-sensorial experience, both from a textural and flavor standpoint.”

“As the shift towards plant based continues, it’s an exciting time to be a developer exploring various ingredients and flavor pairings. R&D teams are challenged to innovate and create new products that fit to new and evolving trends, making the right ingredient choices is imperative. So, as the food landscape continues to evolve, I look forward to seeing where the world of new product innovation takes us as an industry.”

Read on to find out about Chef Farkas’ explorations into plant-based snacking.

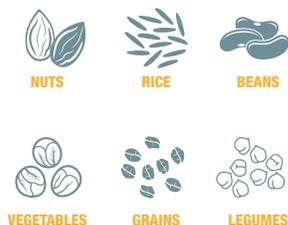
Almond Protein Power: Complete Your Plant-Based Concept

Amino acids are the building blocks of protein,² and protein is an essential nutrient that helps build and preserve muscle, bone, skin and nails.³

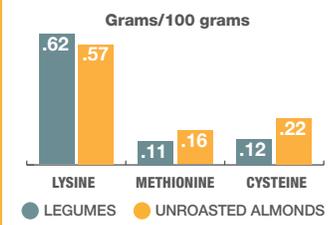
A food is considered a “complete” protein when it contains adequate amounts of **all nine essential amino acids**.⁴

Many plant-based foods are **“incomplete” proteins** because they are missing or low in one or more of the nine amino acids.³

But by combining plant-based foods that have contrasting amino acid profiles, **a complete protein can still be created**.³



For example, almonds are high in amino acids that legumes and pulses lack – **these are called complementary proteins**.⁵



1 - Food Ingredients First, Innova Market Insights: The plant-based revolution marches on, Sept 2020
 2 - <https://ghr.nlm.nih.gov/primer/howgeneswork/protein>
 3 - <https://www.nutrition.gov/topics/whats-food/proteins>

4 - 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.
 5 - U.S. Department of Agriculture, Agricultural Research Service. 2018. <https://fdc.nal.usda.gov/fdc-app.html#/food-details/170567/nutrients>



Plant-Based Snacking: Your Questions Answered



When it comes to plant-based snacking, product developers are just getting started. According to Innova Market Insights, plant-based claims for global food and beverage launches are experiencing strong growth with a compound annual growth rate of 57% over the 2015 to 2019 period.

As a result of such growth, snack brands are wondering how to remain relevant—and deliver more healthful appeal—in an increasingly crowded category.

Chef Farkas says to let almonds inspire innovation.

“Almonds are such great foundations for plant-based snacking,” she says. “With so many ingredient formats, textures, flavors— and the 6 grams of healthy plant-based protein per serving that consumers want—they make exploring plant-based snack opportunities really exciting.”

To find out more, the Almond Board of California (ABC) took a peek into Chef Farkas’ kitchen.

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ABC

To start, the fact that we’re using terms like “plant-based” rather than “meatless,” “vegan” or even “vegetarian” says a lot about the category’s expansion and its evolution. What does that term tell you about how the category has grown?

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Chef
Christine

To me, “plant-based” conveys a refreshing openness and richness that you now see in this category. Moving in a plant-based direction lets consumers dive into all the emerging ingredients out there, and instead of being just a “diet,” it creates new culinary adventures that enhance our lives nutritionally and experientially. We’re gaining options, not losing them.

Consumers used to feel that by focusing on plant-based foods— even for positive reasons—they’d inevitably have to miss out on some of life’s tastiness, as I like to call it. And food is such a big part of our lives— nourishing us, giving us energy, bringing us together as a community— that no one wants to feel like they’re missing out, right? So, it’s encouraging to see so many plant-based options available today with no need to sacrifice anything— not taste, texture or variety, and certainly not nutrition.

The plant-based movement is starting a conversation that can lead to lifestyle change and that has real longevity.

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ABC

Taste, texture, variety, nutrition— are these the qualities consumers want from plant-based choices?

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Chef
Christine

Absolutely. Consumers’ goals for plant-based eating are all over the map, which is exciting to see, in my opinion.

When I talk to consumers, they bring up topics like clean labels and healthy halos, and they see plant-based foods as tools in their kits for delivering this health and vitality.

That said, what interests and excites them is also part of the picture, and today’s plant-based foods need to generate excitement and inspire a sense of adventure, letting people enjoy those intriguing tastes and cuisines.

“ ABC

With all of those considerations in mind, where do almonds fit into the equation?

“ Chef Christine

Almonds play such a substantial role in satisfying those needs.

Just look at all the alt-dairy products out there. Almonds really helped pioneer that category: almond milk, yogurts, cheeses, alternative spreads, even indulgent desserts. But you also see almonds and almond ingredients in blended burgers and sauces— and especially in snacks.

“ ABC

Snacks are a plant-based bright spot. Any comments on why plant-based snacking has flourished— and why almonds inspire such snacking creativity?

“ Chef Christine

Full disclosure: I love snacking. And as a snacker and snack developer, I know from experience that the snack space has an incredible impact on how we get through our days.

I think this category is a creative hotspot because we snack in so many different ways every day. We snack for wellness— to get a quick burst of energy or a “pocket” of nutrition when we need it most. And we also snack for convenience, because a grab-and-go package of seasoned nut clusters or a single-serve energy bar is a lot easier to eat than a full meal.

And there are plenty of creative ways that almond ingredients help snackers meet all those needs. They’re nutritional powerhouses that we can transform into a range of formats that ward off hunger and keep you going between meals, workouts, meetings— all the good stuff.

“ ABC

What do you, as a food professional, enjoy about formulating plant-based snacks with almonds?

“ Chef Christine

As a chef, the first thing I’d say is that almonds are exciting and inspiring in culinary applications for their sensory benefits: the textures, flavors, formats. These are all incredible draws. You can explore sweet and savory profiles and dive into nearly every category and cuisine.

“ ABC

There are 14 different almond ingredient formats at last count. Which are your favorites from a functionality and formulation standpoint?

“ Chef Christine

Fourteen and counting— that’s a lot, and they’re all cool to explore as a chef and developer. Almonds in their whole form, and in formats like slices and slivers and diced, give texture, bite and flavor to snacks— and that flavor gets even better when you roast the ingredients to bring out those nutty notes.

Almond milk and butter are highly functional in bringing taste, texture and nutrition to applications— I’m thinking sauces and alt-dairy ice creams, for starters— where we’d never experienced almonds this way before.

But it’s defatted almond protein powder that I’ve really been enjoying lately. That’s my jam right now, and it’s been on my bench quite a bit, where I’m using it a lot in bars and bites.

“ ABC

Why is defatted almond flour, also known as almond protein powder, so fun to work with?

“ Chef Christine

What I love most about almond protein powder is that it's a very neutral ingredient, so it blends well into a range of applications.

But what's also cool is that it has a slightly nutty, almost sweet-almond profile that's not as distinctive as some other plant proteins, but that adds just a hint of appealing flavor to whatever it's in— sweet or savory— while still letting other ingredients shine.

I'm playing with it a lot in beverages and bars, and the fact that it's easy to work with as an ingredient and blends smoothly into the applications is great, too. It makes bars super chewy and beverages so lush, with none of the chalky mouthfeel that some other plant proteins have. I've tested it in a few different concepts and it's been a really enjoyable ingredient to incorporate.

“ ABC

We know that some plant proteins are low or missing one or more of the amino acids necessary to qualify as a “complete protein.” How do you formulate with almonds and other plant proteins to complete the picture?

“ Chef Christine

In [beverages](#) and [bars](#) I'm really diving deep into the complementary protein equation, looking for where we can pair almonds and almond protein powder with, for example, proteins and flours from pulses like peas, chickpeas and beans to build a more complete protein for consumers who want that from their plant-based snacks.

And blending all these ingredients has been an interesting exploration. On the bar side, I've combined ground almonds and almond protein powder with pea protein, using fruit paste as a binder. And in beverages, I'm working with almond protein powder, almond milk and purees— chickpea, fruit— to make [blended plant-protein smoothies](#) that are rich and innovative.

“ ABC

Rich and innovative: both key qualities. But if you were to choose three more key qualities that plant-based snacks need to succeed today, what would they be— and how do almonds deliver them?

“ Chef Christine



First, they have to be [delicious](#). They have to meet or exceed sensory expectations and give consumers that sense of enjoyment so that the snacks draws them back time and again. And almonds deliver that. They have the flavor, texture and format variety to keep consumers engaged.



Of course, [nutrition](#) is also important— maybe even tied with delicious for first. So we're talking about clean labels, ingredients that consumers feel good about putting in their and their kids' bodies and nutrients like protein, fiber and vitamin E that make a snack really good for you. And again, almonds check off all those boxes, making for an incredibly nutritious snack build.



And because these are snacks, designing [convenience](#) into the package so that consumers can just grab them and go is essential. We know that almonds fit into so many convenient snack formats, as we've discussed above.

So if you lock in [convenience](#), [deliciousness](#) and [nutrition](#), you take the guesswork out of innovation. And that's what almonds do. They make plant-based snacking easy, fun and completely satisfying.



SWATI KALGAONKAR

Associate Director, Nutrition Research at ABC

Understanding and Optimizing Almond Protein Quality

Swati Kalgaonkar, Associate Director, Nutrition Research at the Almond Board of California (ABC) explains what makes protein important, and how California almonds contribute to a healthful protein package.

ABC

It seems that plant proteins, in particular, are attracting attention. What makes them special?

Kalgaonkar

For one, plant protein comes without the some of the high fat and cholesterol that you'd otherwise have to worry about when thinking about some animal-based protein sources.

ABC

What is the PDCAAS and why is it a notable measure of protein quality?

Kalgaonkar

PDCAAS refers to the protein-digestibility corrected amino acid score, and it's a measure of protein quality that accounts for both a protein's amino acid profile and the digestibility and absorption of those amino acids. You have to consider how well the body digests, absorbs and uses those amino acids, too. So when a protein-quality measure "corrects" for protein digestibility—as the PDCAAS does—it gives a fuller picture of the food's true protein quality.

ABC

What is the main characteristic a formulator should consider when choosing which protein sources to work with?

Kalgaonkar

While protein quality is an important aspect to keep in mind, focusing on it too much can encourage a kind of tunnel vision. It's important to take the big picture into perspective, too, and to understand that, in reality, people consume diets, not just isolated protein sources. I'm more in favor of an approach that doesn't insist on a perfect protein quality measure of 1, or 100 percent. I'd rather see people consume a combination of different proteins from different sources that complement each other.

ABC

What do we mean by protein complementarity?

Kalgaonkar

It goes back to a protein's amino acid profile, and especially to its content of essential amino acids—the amino acids that the body can't make on its own but must take in through diet. Some protein sources are rich in some of these amino acids and poor in others, while other proteins have profiles that are the exact opposite. We call these "complementary" proteins, because their amino acid profiles complement each other.

ABC

Where do almonds fit and why should they be considered a formulator's "secret weapon" for optimizing protein healthfully?

Kalgaonkar

A perfect example is combining almonds with legumes. Almonds are high in amino acids that legumes and pulses lack—and vice versa. That makes them a perfect complementary protein combination. By consuming almonds along with a variety of other healthy protein sources, it's easy to supply the requisite protein quantity and quality the body needs.

It's important to remember that a protein source is never just a protein source. It's a complete nutritional package. And you have to look at that complete package to see what else it has to offer. So, if a protein source comes with saturated fat and cholesterol along with a "perfect" PDCAAS of 1, it may be a "perfect" source of protein, but it's not a perfect food. By contrast, almonds—with their fiber, vitamin E, healthy monounsaturated fatty acids and complementary plant-based protein—might be the better option.