



## Stop and Smell the Nut Flours

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The average consumer believes nuts come in one of three forms: in a shell, out of a shell, or as a chunky or creamy paste in a jar. Product developers, however, are discovering exciting new applications for a fourth functional nut form: nut flours.

### Not the same ol' grind

Put simply, nut flours are ground-up versions of whole nuts. Almost any tree nut can be used, as well as peanuts (not technically a nut but generally treated as one). In some cases, though, nuts are chosen for compositional characteristics. Bruce Kotz, vice president, specialty products, Golden Peanut Company, Alpharetta, GA, notes: "We use high-oleic southeast runner peanuts for the majority of our product line. The high-oleic nature of the peanuts we use helps to extend the shelf life of the peanut flour itself and the finished food product it is used in, and is also a slightly more heart-healthy fatty-acid profile."

Fat levels affect nut flour characteristics, as well. Nuts left over from oil-extraction processes can be ground to yield flours with a drier texture than those used from a "raw" state. Peanuts undergo a mechanical defatting process to achieve specific fat levels. "We offer 12% fat and 28% fat peanut flours," explains Kotz. "The 28% fat line is more flavorful, more economical and a little lower in protein. Our 12% fat product line has a high protein level with a minimum of 50%, while the 28% fat line contains a minimum of 40% protein."

Nuts can be blanched to remove all or a portion of skins, which are rich in tannins that can cause off-flavor development. Blanching and subsequent roasting steps facilitate flavor and aroma development. "We offer a variety of roast levels, which will not only affect the flavor and aroma, but the color of the peanut flour, too," Kotz says.

And finally, there's the grind itself. With a range of mesh sizes available, developers must consider the flour's usage and impact on the product to which it is added. "The particle size of almonds in cut forms or flour will definitely affect texture and mouthfeel," says Guangwei Huang, principle scientist of food technology, Almond Board of California, Modesto, CA. "Coarser flour will provide a grainier feel, while finer flour offers a smoother feel in a bakery application. Finer flour (smaller particles) requires fine-grinding that will result in more mechanical disruption in cellular structure and more air exposure than coarse pieces, which might indicate a shorter shelf-life potential." He also notes that finer particles can release oil, which is then susceptible to oxidation.

### Beyond the bowl

Nuts have been both snack and staple throughout history. History tells of people utilizing various types of nuts for nutritional and medicinal benefits, and as a medium of trade. More-recent findings have revealed that nuts provide an array of nutritional elements, including protein, vitamin E, fiber, calcium, magnesium and potassium, as well as phytochemicals and omega-3 fatty acids that help protect

against a variety of chronic diseases, and polyunsaturated fats that help lower cholesterol.

Product developers in culinary and commercial arenas are discovering ground nut products' positive effects on taste, texture and nutrition. Rachel Zemsér, food scientist and consultant, California Walnut Board, Folsom, CA, suggests walnuts are well-suited for addition to ethnic sauces such as those from Spain, Portugal, Morocco, Greece, Turkey and other parts of the Middle East. "Walnuts are an ideal choice for a nut-thickened sauce because their polyunsaturated fats contribute to a smooth and creamy mouthfeel, and the finely ground nut flour has superior thickening power," she says.

Demand for peanut flour in the health-and-wellness market and the sports-foods arena is growing. "Peanut flour is the highest natural source of arginine, an amino acid that helps to dilate the blood vessels. This is in high demand with fitness buffs who are looking to increase their capacity," says Pat Kearney, director of programs, The Peanut Institute, Albany, GA. "Most peanut-flavored nutritional bars you pick up will have peanut flour in them. It is a common ingredient because peanut flour is also a good source of fiber that helps to promote satiety."

Peanut flours also provide opportunities for reducing fat levels in traditionally high-fat favorites. "For peanut-butter-filled confections and baked goods, peanut flour helps stabilize the fat, thus extending the shelf life naturally," Kotz says. "To make reduced-fat peanut butter, our 12% fat peanut flour blended with full-fat peanut paste will reduce the fat enough to make a 25% reduced-fat claim."

## Bloomin' big market

One of today's most rapidly growing health-related markets is gluten-free. With 1 in 133 Americans suffering from celiac disease, or gluten intolerance, gluten-free foods and beverages have moved quickly from specialty stores to mainstream supermarkets and mass retail outlets, creating a market estimated at \$2.6 billion in 2010 and expected to approach \$6 billion in 2015, according to "Gluten Free Foods and Beverages in the U.S., Third Edition," a Feb. 1, 2011, report from Packaged Facts, Rockville, MD.

This growing market has created an array of opportunities for many types of nut flours. "Almond flour is commonly used in bakery products as a flour replacer, cereal, thickening agent, sauce or a pre-coating for oil-fried products to enhance surface texture," Huang says. "In any application involving wheat flour, almond flour can play a role, especially for gluten-free applications."

In addition to being gluten-free, Kotz explains that peanut flour is kosher, 100% peanuts, contains no additives, and is offered in both all-natural and 100%-organic versions. "Peanut flour can be labeled as 'peanuts' or 'peanut flour' or 'roasted peanuts,'" he says, "making your ingredient declaration short and clean."

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