Almonds for Nutritious and Delightful Breakfast Cereals

K. Shelke[1]
Corvus Blue LLC
Chicago, IL, U.S.A.

R. A. Miller
Department of Grain Science and Industry, Kansas State University
Manhattan, KS, U.S.A.

While it may seem like an overused cliché—breakfast is arguably the most important meal of the day. Studies abound showing that eating breakfast improves cognitive function, enhances cholesterol profile, and reduces the risk of developing diabetes (7,10,12,13,16,20,23, 26–28,30,31), while breakfast consumption by children may improve cognitive function related to memory, test grades, and school attendance (2,6,9,17,19,24,27, 29,34,37). Science also links regular consumption of breakfast with a healthy weight and BMI despite a generally greater intake of calories (3,8). In several studies, the more often people ate breakfast, the less likely they were to be obese (1,4,5,18,32,35).

Trends and Opportunities in the Breakfast Arena

In an online survey conducted by the Sterling Rice Group (http://bit.ly/wEuhIG), 85% of respondents indicated that breakfast is the most important meal of the day. Taste, nutrition, satiety, and ease of preparation were the most important attributes. Breakfast is more than just a meal—it is part of an important ritual that has health and general wellness implications.

In one of the largest surveys ever conducted, encompassing more than 14,000 Americans from a wide range of socioeconomic levels, geographic regions, and ages, the Kellogg Company discovered that while the vast majority of respondents regard breakfast as important, hectic mornings do not allow them to fit the meal in every day. Only one-third of respondents eat breakfast every day, even though more than half (54%) of the adults said they would like to. The majority of mothers (89%) indicated they want their kids to eat breakfast every day, but 40% reported that their children do not eat breakfast daily.

For millennia, and in practically every region of the world, breakfast has typically included a grain-based carbohydrate, often a hot or cold cereal or baked product. Ready-to-eat (RTE) breakfast cereals appeal to a wide demographic that includes varying ages, income levels, and cooking skills because they are convenient, economical, nutritious, shelf stable, lightweight, and easy to ship and store (11,15). The top reasons cited for breakfast cereal consumption are that it is quick (75%), more healthy than other breakfast foods (45%), and a favorite item (30%). For some 45% of respondents, eating a high-fiber cereal is a great way to manage hunger and weight control, while roughly 20% of respondents reach for breakfast cereals for other health-related reasons, such as reducing the risk of heart disease or controlling blood sugar (25).

A collaborative survey by The Food Channel, CultureWaves, and Mintel International found that hot or cold cereal was second to eggs as the most commonly consumed food for breakfast in the United States over the last decade. Consumers tend to keep a variety of RTE breakfast cereals on hand and alternate between them.

In recent decades, the convenience and health halos of cold breakfast cereals have dramatically increased their popularity with parents around the world, who view them as the snack of choice for toddlers and children. Today, the evening meal is evolving into the second most popular time to consume breakfast cereals (22). Their quick and easy preparation and high nutritional value make them appealing to time-starved, tired, and/or calorie-conscious consumers seeking a nourishing food that is convenient and affordable.

Stagnation and Lack of Innovation in the Breakfast Cereal Market

Ironically, despite all the attention and opportunities available in the marketplace, the breakfast cereal category has remained relatively cautious in terms of new products and innovations for several decades. Innovations over the past decade have been conservative, including the introduction of whole specialty grains such as amaranth, barley, buckwheat, kamut, quinoa, spelt, teff, and sorghum; addition of dried fruits, nuts, and fiber; inclusion of a wide range of flavors; and reduction of sweeteners, salt, and calories.

Critics note that even alternative ingredients such as pulses have been converted into cereal-like, bland flaked pieces that are incorporated inconspicuously instead of highlighting their unique flavor and texture. Food companies have tended to remain with the pack in terms of appearance, packaging, and flavor, leading to the tendency to repeatedly shy away from unique and distinctive flavors.

Despite the well-documented advantages breakfast cereals offer, the category has not kept up with growth in the breakfast foods market. A growing perception that breakfast cereals may not be as wholesome and nutritious as once thought could be one cause. Consumers present tall orders for breakfast cereals, often listing attributes that are at odds with each other. They seek a multitude of functional and health benefits but also expect a short list of ingredients that are preferably pure, organic, and less processed.

Despite the appeal of breakfast cereals across a wide range of demographics and strong brand recognition, nearly two-thirds of those who eat cereals do not believe that leading brands provide higher quality cereals (21). The refined sugar and flour contents of many breakfast cereals, as well as the addition of artificial colors and flavors, have given some breakfast cereals a negative connotation among shoppers, particularly parents. Public health experts like Marion Nestle point out the conspicuous absence of fiber and the high level of sodium being added to products that are naturally low in sodium.

The taste, particularly the sweetness, of breakfast cereals is often a contentious topic. A number of ingredients, such as corn and tapioca syrups, are generally perceived as empty fillers or sweeteners. On the other hand, sweeteners, syrups, and flavors are essential to compensate for the bland cardboard-like flavor and texture that may develop in many cereals processed for enhanced digestibility dur-

[1] Corresponding author. E-mail: kantha@corvusblue.net; Tel: +1.312.951.5810.

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ing storage. In an article on the nutritional quality of breakfast cereals marketed to children (33), researchers compared breakfast cereals marketed to children with other RTE cereals and found that children's cereals were higher in calories, sugar, and sodium and lower in fiber and protein. The researchers recommended that "dietary advice for children to increase consumption of ready-to-eat breakfast cereals should identify and recommend those cereals with the best nutrient profiles." Manufacturers point out that just as the addition of sweet flavors enhances the palatability of children's medicines and vitamins, the addition of sweeteners to breakfast cereals enhances the taste at a modest nutritional cost compared to the nutritional benefits.

Almonds—Ideal for Breakfast Cereals

As market forces look to restore the breakfast crown to RTE breakfast cereals, this clearly encourages manufacturers to incorporate wholesome ingredients that can enhance the texture, nutritional profile, and overall quality of breakfast cereals, as well as minimize the list of ingredients and processing aids and create cleaner labels. Almonds offer a multipronged solution to manufacturers seeking innovative ways to add to the nutritional content, functionality, flavor, and texture of their breakfast cereals using a single ingredient.

Almonds are a leading source of α-tocopherol (7.4 mg/28 g serving, 35% RDA), the form of vitamin E the human body absorbs best. They are also a good source of fiber (12% by weight). Finally, with only 1 g of saturated fat and 13 g of unsaturated ("good") fat per serving, these cholesterol-free nuts are a good fit for many commercial weight-loss plans (e.g., Weight Watchers, Mediterranean Diet, and South Beach Diet).

With their inherent fiber and naturally occurring vitamins, minerals, and phytochemicals, almonds provide an attractive appearance and a general sense that products that include are delivering a premium. Many consumers instantly recognize the added value when they see almonds listed on the ingredient label. In its North American Consumer Awareness, Attitudes & Usage Study, the Almond Board of California found that consumers select almonds because they "taste better" and are " nutritious," "heart-healthy" and "low in saturated fat." This is music to the ears of marketers seeking easy ways to walk that fine line between indulgence and nutrition.

Almonds have a long history of culinary and nutrition applications. Research indicates an association between almond consumption and reduced risk of a variety of chronic diseases, including obesity, heart disease, and diabetes (14,23,31,32). Clinical evidence indicates that a high level of almond consumption (≈60 g/day or an equivalent amount of defatted almond flour with almond oil) has neutral or beneficial effects on glycemia and insulinemia—metabolic factors that are implicated in the progression of type 2 diabetes (14). The high levels of fiber, unsaturated fat, antioxidants, and phytochemicals found in almonds may help explain their positive health effects. Almond lipids, whose bioaccessibility is a function of mastication efficiency and processing, may also be a predominant contributor to alterations in insulin sensitivity and satiety.

Almonds Offer a Multitude of Processing Options

While adding almonds to breakfast cereals is not new, advances in processing technologies have opened up a multitude of options for almond processing. Due to their unique density and cell structure, almonds can be processed into a wide range of robust shapes and thicknesses with unique crunchy textures. Almonds can be sliced, diced, slivered, crushed, and flaked to alter their texture profile. Slices, slivers and flakes are particularly suitable for manufacturers seeking to economize, because the expanded size and surface area give the impression that a larger number of almonds are present, making the product more cost-effective.

Almonds are typically used in raw, blanched, or roasted forms. Roasting offers a new flavor dimension and crunch profile that can be used to complement fabricated add-ins and even some flavor additives. Almond kernels roasted in hot air or oil are crunchy and brown and have a desirable roasted flavor profile. The color and flavor of roasted almonds can be controlled by adjusting the temperature, type of oil used, degree of roast, etc. Roasting does not affect the nutritional value of almonds and can help preserve microstructure and integrity through the mechanical rigors of processing and handling.

Other almond products also offer exciting opportunities in the breakfast cereal

Table I. Beneficial properties and profiles that almonds offer for breakfast products[a]

Prototype	Innovation	Market Appeal
Almond cereal, "Stix"	For breakfast or as a crunchy morning snack, this application is filling and crunchy, incorporating whole almonds, almond flour, and almond milk.	Gluten-free extruded crisp provides 11 g of protein per serving and heart healthy satiety
Almond hot cereal	An all-almond hot cereal made with almond flour and meal, almond milk, and almond butter. Almond meal changes the texture and nutritional profile of an otherwise traditional hot, cooked cereal. This gluten-free application adds protein and increases satiety.	Gluten-free hot cereal provides 6 g of protein per serving, no added flavors, and improved satiety
Almond date breakfast bar	A convenient, wholesome breakfast bar that is made with almond flour, but no grain, lightly sweetened with rice syrup, and baked.	Gluten-free portable baked product with no added flavors
Almond breakfast cookie	A cookie with the punch of an energy bar! Almonds are partnered with oats, other whole grains, and dried fruits.	Portable product to which flavors can be easily added to increase appeal
Almond corn cake	A simple batter preparation for rich, pancake-style griddle cakes that is designed to meet the need for a substantial, satisfying breakfast product.	Versatile product offers improved satiety and is suitable for a multitude of cuisine styles and sweet or savory applications
Granola with almonds	Loose granola is arguably one of the most substantial cereals and offers endless variations and applications.	Suitable for sweet or savory applications and provides improved satiety
Almond drop biscuits	A new breakfast biscuit that reinvents a classic for increased desirability and nutrition; it is easy to prepare and complements other flavors and ingredients such as dried fruits.	Gluten-free product is suitable for sweet or savory applications and provides improved satiety

[a] Source: Almond Board (http://bit.ly/wb6cL3).

arena. Regular or defatted almond flour offers a combination of golden color, crunch, and flavor in gluten-free breakfast cereals without the need for flavor and color additives (Table I). Almond oil extracted from toasted or raw kernels can be spray-coated on breakfast cereals to lend a premium flavor and an aroma associated with upscale desserts.

The subtle flavor and hearty crunch of almonds complement many ingredients and flavors. According to reports by the Sterling-Rice Group (http://bit.ly/zaiteO), some of the more popular almond pairings selected by health-conscious consumers include oats, wheat, dried blueberries, dried cranberries, dried strawberries, honey, and cinnamon—ingredients that are also commonly used in breakfast cereals.

Conclusions

When people reach for breakfast cereals, they are reaching for a multitude of distinct functionalities. In an online survey conducted by the Sterling-Rice Group (http://bit.ly/wEuhIG) consumers rated taste, nutrition, and satiety as the most important breakfast attributes. Cereal eaters typically look for products that are filling, heart healthy, high in fiber, and have a good crunch.

Almonds can deliver all of these attributes, and few other ingredients can compete with the functionality and up-scale appeal of almonds. In an online consumer survey by the Sterling-Rice Group (http://bit.ly/wEuhIG), almonds were the preferred and most consumed nut at breakfast and outscored other ingredients in the categories of taste, nutrition, and satiety. Additionally, almonds have been reported by consumers as the nut that delivers the best crunch (36).

Among tree nuts, almonds contain the highest levels of protein, fiber, calcium, vitamin E, riboflavin, and niacin, as well as monounsaturated ("good") fats. Almonds have also been reported to complement weight, glucose, and hunger management efforts.

Almonds are available in a wide array of forms that can easily be incorporated into a wide range of innovative breakfast cereals. They have a strong, recognizable image as being nutritious and can be processed into products with a multitude of functional, flavor, and texture attributes. Thus, almonds are a wholesome ingredient that can successfully be utilized to heighten the premium perception and enjoyment factor of breakfast cereals.

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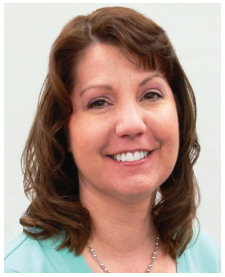
Kantha Shelke is a principal at Corvus Blue LLC, a Chicago-based food science and research firm that specializes in industry competitive intelligence, expert witness services, and new product and technology development and commercialization of foods and food ingredients for health and wellness. Kantha's contributions extend to integrating scientific and market research findings to accelerate the development of products and services that will truly enhance the well-being of people. Kantha serves as the editor-at-large for Penton Media's *Functional Ingredients*, advisory board member for the *Nutrition Business Journal*, technical editor for Putman Media's *Food Processing*, and science and technology commentator for the Private Label Manufacturer's Association. She most recently wrote for *The Oxford Encyclopedia of Food & Drink in America* and just completed a book on *The Global History of Pasta*. Kantha is an AACC International member and can be reached at kantha@corvuslbue.net.



Rebecca A. Miller is a research assistant professor in the Department of Grain Science at Kansas State University (KSU), Manhattan, and serves as director of the Wheat Quality Lab. Prior to joining KSU, she worked at R&R Research Services, Inc., conducting contract research and teaching short courses in the United States and abroad. Rebecca is an active member of AACC International, she serves as co-chair of the Bread Baking Methods Technical Committee and as a member of the Book Committee and the Edith Christensen Award Jury. She is currently serving in her third term as an associate editor for *Cereal Chemistry*. She has published 22 refereed journal articles and holds 2 U.S. patents. Rebecca can be reached at beckym@ksu.edu.