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/wEuH1G), 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-
ing storage. In an article on the nutrition-
al 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 in-
crease consumption of ready-to-eat
breakfast cereals should identify and rec-
ommend those cereals with the best nu-
trient 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 com-
pared 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 pro-
file, and overall quality of breakfast cere-
aals, as well as minimize the list of ingredi-
ents and processing aids and create cleaner
labels. Almonds offer a multipronged solu-
tion 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-to-
copherol (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 commer-
cial weight-loss plans (e.g., Weight Watch-
ers, 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 process-
ning and handling.

Other almond products also offer exci-
ting opportunities in the breakfast cereal

<table>
<thead>
<tr>
<th>Prototype</th>
<th>Innovation</th>
<th>Market Appeal</th>
</tr>
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<tbody>
<tr>
<td>Almond cereal, “Stix”</td>
<td>For breakfast or as a crunchy morning snack, this application is filling</td>
<td>Gluten-free extruded crisp provides 11 g of protein per serving and heart</td>
</tr>
<tr>
<td></td>
<td>and crunchy, incorporating whole almonds, almond flour, and almond milk.</td>
<td>healthy satiety</td>
</tr>
<tr>
<td>Almond hot cereal</td>
<td>An all-almond hot cereal made with almond flour and meal, almond milk,</td>
<td>Gluten-free hot cereal provides 6 g of protein per serving, no added flavors,</td>
</tr>
<tr>
<td></td>
<td>and almond butter. Almond meal changes the texture and nutritional profile</td>
<td>and improved satiety</td>
</tr>
<tr>
<td></td>
<td>of an otherwise traditional hot, cooked cereal. This gluten-free application</td>
<td></td>
</tr>
<tr>
<td>Almond date breakfast bar</td>
<td>A convenient, whole almond food bar that is made with almond flour, but</td>
<td>Gluten-free portable baked product with no added flavors</td>
</tr>
<tr>
<td></td>
<td>no grain, lightly sweetened with rice syrup, and baked.</td>
<td></td>
</tr>
<tr>
<td>Almond breakfast cookie</td>
<td>A cookie with the punch of an energy bar! Almonds are partnered with oats,</td>
<td>Portable product to which flavors can be easily added to increase appeal</td>
</tr>
<tr>
<td></td>
<td>other whole grains, and dried fruits.</td>
<td></td>
</tr>
<tr>
<td>Almond corn cake</td>
<td>A simple batter preparation for rich, pancake-style griddle cakes that is</td>
<td>Versatile product offers improved satiety and is suitable for a multitude of</td>
</tr>
<tr>
<td></td>
<td>designed to meet the need for a substantial, satisfying breakfast product.</td>
<td>cuisine styles and sweet or savory applications</td>
</tr>
<tr>
<td>Granola with almonds</td>
<td>Loose granola is arguably one of the most substantial cereals and offers</td>
<td>Suitable for sweet or savory applications and provides improved satiety</td>
</tr>
<tr>
<td></td>
<td>endless variations and applications.</td>
<td></td>
</tr>
<tr>
<td>Almond drop biscuits</td>
<td>A new baked breakfast biscuit that reinvents a classic for increased</td>
<td>Gluten-free product is suitable for sweet or savory applications and provides</td>
</tr>
<tr>
<td></td>
<td>desirability and nutrition; it is easy to prepare and complements other</td>
<td>improved satiety</td>
</tr>
<tr>
<td></td>
<td>flavors and ingredients such as dried fruits.</td>
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</tbody>
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Table 1. Beneficial properties and profiles that almonds offer for breakfast products*

area. 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 upscale 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.

References


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A paid ad appeared here in the printed version of the journal.