

by Donald E. Pszczola

New Awakenings for Breakfast

Surveys have shown that although breakfast is generally recognized as the most important meal of the day, more than 30% of adults eat breakfast less than four times a week. This means, of course, that there is untapped potential for convenient retail breakfast foods.

Also, where we eat our breakfast can be a significant consideration for product developers. In a recent IFT webcast (February 11, 2011), Darren Seifer, Food & Beverage Industry Analyst for The NPD Group Inc., a leading market research company, spoke on challenges and opportunities for increasing consumer demand for healthier foods. He noted that in terms of distribution of all breakfast meals, at-home accounted for 77%. Carrying a breakfast meal from home can also present opportunities, he added. Consider how many of us start our day by eating cereal, breakfast bars, or a yogurt in front of our computers.

Furthermore, according to Packaged Facts' new report, "Frozen Convenience Foods in the U.S.," pizza, hand-held breakfast foods, and prepared vegetables have led sales in the frozen convenience foods market despite the economic landscape—

Breakfast foods are being revitalized, adopting new formats, better-for-you formulations, and ethnic flavors:

suggesting the viability, resiliency, and growth potential of the breakfast category and the ingredients that play an important role in its formulating.

For example, Jimmy Dean is rolling out two new product extensions to its line of better-for-you frozen breakfast offerings. *Jimmy Dean D-lights Ham Bowl*—made with lean ham, scrambled egg whites, potatoes, and reduced-fat cheese—contains 220 calories, 21 grams of protein, and 7 grams of fat per serving, and was available on shelves in February 2011. *Jimmy D's Pancake Griddler*—a maple pancake breakfast sandwich with seasoned Jimmy Dean turkey sausage—has 230 calories, 9 grams of protein, and 8 grams of fat per serving, and will be on store shelves this month. Both products present protein as key to the start of the day, along with an



The breakfast category is ever evolving to include big versions, small versions, bars, egg sandwiches, wake-up wraps, waffle desserts, indulgently flavored yogurts, and gluten-free items, just to name a few. In these applications, ingredients such as eggs, whole grains, cereals, dairy, and fruits can help jump start the day, providing wake-up calls regarding product innovation and the addressing of health concerns.

Photo courtesy of LycoRed Ltd.

emphasis on heartiness and fewer calories.

A new study, published in the *Journal of the American Dietetic Association*, reported that children and adolescents who start their day off with ready-to-eat breakfast cereals have better nutrient profiles than those who skip breakfast or eat other

types of breakfast. That is good news which may even be better when considering the potential advances of whole grains in this sector. (Also, my *IngredienTalk* blog post on page 56 looks at a study that focuses on children's consumption behavior during a breakfast meal when served high- vs low-sugar ready-to-eat cereals. The findings of this study offer some encouraging news that may help promote a more balanced first meal as well as encourage the development of more better-for-you breakfast foods for kids.)

In a report released by Global Industry Analysts, a leading market research publisher, the global market for whole grain and high-fiber foods is forecast to reach more than \$24 billion in the U.S. by 2015. The development of new breakfast foods made with

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whole grains seems promising, especially with the release of the new Dietary Guidelines in the U.S. expected to push up the sales of healthy food products, such as those made with whole grains. The report noted that the usage of whole grains (and reduction of fats and sugars) were some of the most popular claims for the global breakfast cereal market. Also, inclusion of fruits in cereals was another prevalent trend, "aiming to give a healthier image makeover to cereals."

The appeal of oats is helping to

drive a relatively mature breakfast cereals market: Of the more than 1,360 breakfast cereal launches recorded by Innova Market Insights, a new product development tracking tool, in the first five months of 2010, nearly 45% reportedly contained oats. The health benefits of oats have traditionally been associated with the hot cereals/porridge/oatmeal market, which has been moving forward via the use of added-value ingredients such as fruits and nuts, as well as convenient packaging innovations. In the foodservice area, you may recall that McDonald's

started the New Year with the introduction of its *Fruit & Maple Oatmeal*, providing 290 calories per serving.

McDonald's is not the only participant in the great breakfast competition derby that begins each day even before the sun rises. According to The NPD Group, breakfast accounted for nearly 60% of the restaurant industry's traffic growth over the past five years. Research shows that for the year ending March 2010, there were more than 12 billion morning meals served at U.S. restaurants, and 80% of restaurant morning

meals were purchased from quick-service restaurants. Mintel reports that restaurants added more than 460 new breakfast items to their menus in 2009 (more than in 2007 and 2008), and although the market intelligence firm notes that breakfast sales may have slowed down somewhat because of the economy, it is still expected that the breakfast foodservice market will expand by 13% from 2009 to 2014.

If there is a decrease in breakfast foodservice sales, that may have a subsequent positive effect on purchasing of processed foods as well as eating at

home habits in general. But in any case, as indicated by these marketing research studies, the development of new breakfast foods remains competitive and strong. And many of these new launches, because they suggest trends in areas ranging from flavor to health, may stimulate new ideas for the creation of processed breakfast foods.

For example, Subway launched a line of egg and cheese sandwiches that included Western egg and cheese; Black Forest ham, egg, and cheese; double bacon, egg, and cheese; and steak, egg, and cheese. They are served on light,

whole-wheat English muffins, flatbread, or traditional hoagie breads. Dunkin' Donuts is offering an egg white turkey sausage wake-up wrap. Quiznos initiated a new breakfast program that includes *Giant Cinnamon Roll*, *Country Sausage and Egg Biscuit*, *Breakfast Sammies* (this morning twist on flatbread sandwiches features premium meats, eggs, and cheeses), and *Breakfast Subs*. Starbucks debuted a protein artisan snack plate consisting of a hard-boiled egg, cheddar cheese and apple slices, multigrain muesli bread, grapes, and honey-butter spread. Jamba Juice features a berry

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Eggs are compatible with a variety of ingredients, as demonstrated by breakfast formulations ranging from quiche to a pizza-style flatbread recipe topped with sunny-side up eggs, candied bacon, spinach, and cheese. The development of new breakfast foods using eggs is shaped by trends in international cuisines, convenience, and nutrition.

Photos courtesy of the American Egg Board (left) and McCormick Flavors

topper ideal meal, made with yogurt, soy milk, strawberries, blueberries, and banana, and topped with pumpkin flaxseed granola. Other interesting products that are available include Cosi's spinach Florentine breakfast wrap; Au Bon Pain's apple-cinnamon oatmeal; Denny's scrambled egg whites, chicken sausage, and fruit; and Panera Bread's *Breakfast Power Sandwich*, made with Vermont white cheddar and smoked lean ham.

With chefs providing their culinary inspiration, breakfast foods are being revitalized, adopting new formats, better-for-you formulations, and ethnic flavors. Some examples of emerging prototypes can include breakfast pizzas, nutritionally enhanced breakfast cookies, wake-up wraps, breakfast sandwiches with ethnic flavor twists, sweet and savory waffle desserts, gluten-free

pancakes, and many others. Interestingly, many of these foods can be eaten at the beginning of the day but are also suitable for other meal times as well. And, in fact, some of them get their inspiration from other meal categories, such as desserts, appetizers, snacks, lunches, and dinners—the results, of course, are some novel hybrids or flavor fusions.

This month's *Ingredients* section will take a look at the ever-evolving category of breakfast foods and the range of ingredients used to help jump-start the day from taste and nutritional perspectives. These ingredients—such as eggs, whole grains, cereals, meat products, fruits and vegetables, nuts, fiber, flavors, and flavor enhancers—can deliver a number of benefits and in the process provide some important wake-up calls regarding product

innovation and the addressing of pressing health concerns.

Breaking Egg News

Imagine the endless possibilities for the use of egg as an ingredient in breakfast foods. Some examples of formulations provided by the American Egg Board (AEB), Park Ridge, Ill. (phone 847-296-7043, www.aeb.org), include *Bacon, Egg, and Mushroom Burrito*; *Baked Eggs with Creamy Spinach and Hash Browns*; *Sausage and Egg Skillet Scramble*; *Mini Orange-Maple French Toast Casserole*; *Potato and Egg Skillet*; and *Sun-Dried Tomato Quiche with Crispy Potato Crust*, just to name a few.

Even a dish such as *Crème Brûlée*, especially with fruit, might make for an indulgent dessert for breakfast. Or it can be reinvented a little to create such fare as *Crème Brûlée French Toast*, *Oatmeal Crème Brûlée*, or a *Crème Brûlée Breakfast Bread Pudding*.

Different trends today are helping to shape the development of new breakfast foods with eggs. For example, Panini or ciabatta—toasted sandwiches normally eaten at lunch or dinner—can inspire the creation of breakfast items such as *Fried Egg and Sausage Ciabatta Breakfast Pizzas*; *Sautéed Mushrooms and Bacon on Ciabatta with Soft Poached Egg*; and *Fried Egg, Prosciutto, and Blue Cheese on Ciabatta*. Or an increased consumer interest in Asian and Hispanic breakfast items might lead to more novel breakfast formats such as *Egg and Veggie Stir-fry Over Rice*; *Chorizo and Egg Breakfast Casserole*; or *Eggs, Salsa, and Corn Tortillas*.

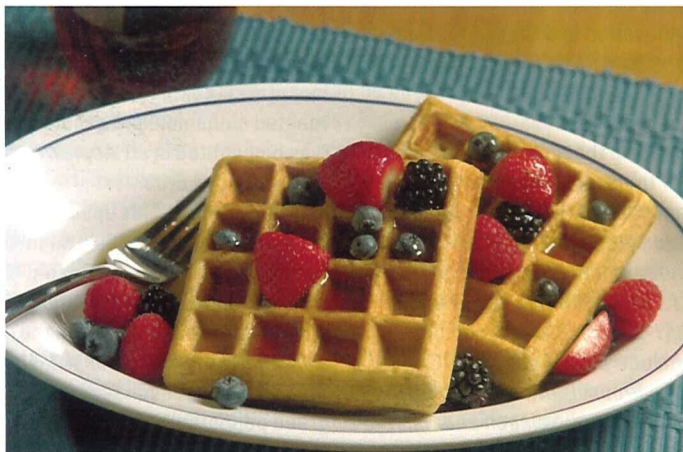
As already shown by the above formulations, eggs are very compatible with a wide range of ingredients. In the *McCormick Flavor Forecast 2010: Holiday Edition*, released by

McCormick & Co., Hunt Valley, Md. (phone 410-527-9753, www.mccormick.com), the pairing of roasted cinnamon and bacon was highlighted in an *Applewood Bacon & Eggs Breakfast Flatbread* recipe. This upscale breakfast pizza features a naan flatbread crust, candied bacon, spinach, Gruyere cheese, and sunny-side-up eggs. Also, in the *McCormick Flavor Forecast 2011*, the pairing of goat cheese and green peppercorns was demonstrated in a flavorful modern take on a traditional baked eggs dish, *Baked Eggs with Goat Cheese and Green Peppercorns*.

One reason that eggs have such an important presence in breakfast foods is because of their nutritional value. Breakfast foods formulated with egg products contain all the nutrients originally found in the egg product, including high-quality protein, *trans* fatty acid-free mono- and polyunsaturated fats, vitamins, minerals, and other highly bioavailable nutrients with recognized health and wellness benefits. According to AEB, one egg (which has 70 calories) provides more than 6 g of protein or 13% of the Daily Reference Value set by FDA. This high-quality protein contains the necessary “building blocks” that bodies need to grow and perform properly. In addition, one egg has 12 other essential nutrients, including choline, folate, iron, and zinc. Choline, for example, is a nutrient that helps with memory and brain development. Nearly all of the choline—and half of the protein—is found in the yolk, which also naturally contains vitamin D. Research has suggested that protein foods such as eggs, keep appetites satisfied longer, helping to preserve lean muscle mass and aid in weight management and fat loss.

Eggs also have more than 20 functionality benefits that can

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A traditional breakfast food such as waffles can be formulated with a mix of whole-grain ingredients to add nutrition along with desirable texture and flavor properties. The addition of a low-calorie syrup and some fresh fruit can make this meal an indulgent one for individuals with diabetes or weight management problems.

Photo courtesy of ConAgra Mills

assist in the creation of breakfast formulations. In a quiche, for example, eggs can function as a binder, holding all the ingredients together. Egg proteins can participate in the Maillard reaction, producing a desirable brown color on baked goods such as a cinnamon bun.

And a number of breakfast foods in the marketplace demonstrate the functionality of eggs. Here are just a few examples.

Batter Blaster—a refrigerated, ready-to-use organic waffle and pancake batter—uses whole egg solids to provide flavor, browning, and structure. **CCF Piggie 'n Biscuits™**, which combines two breakfast classics in one handheld, ready to go meal, is made with dried whole egg to provide volume to the crumb, soften the texture of the crumb, and improve freeze/thaw stability. **Heinz's Weight Watchers SmartOnes Morning Express**, available as a stuffed muffin sandwich and as a quesadilla, relies on pre-cooked egg white product for protein fortification. **Nestle's Breakfast Hot Pockets** (applewood bacon, egg, and cheese; ham, egg, and cheese; and sausage, egg, and cheese)

use egg products to ensure stability and freshness, and to help prevent moisture from migrating between different layers; **VitaTops' Banana Nut Muffin Tops** contain egg whites, which contribute to protein content while providing aeration and humectancy. **Kellogg's Cinnabon Snack Bars** use eggs in the formulation to provide richness and contribute to tenderness and texture.

A variety of egg products are available to the breakfast formulator. These products can include frozen, refrigerated liquid, and dried forms. They can be the whole egg or just the whites or yolks.

As this article was going to press, new data issued by the USDA reports the cholesterol content of eggs has dropped significantly since levels previously measured in 2002. The USDA recently reviewed the nutrient composition of standard large eggs and results show the average amount of cholesterol in one large egg—or its 50 gram equivalent within the further processed egg ingredient category—is 185 mg, or 14% lower than recorded in 2002.

Researchers state one possible explanation for the lower cholesterol content of eggs could relate to nutritional improvements in poultry feed. (The high-quality, nutritionally balanced diet of feed is made up mostly of corn, soybean meal, vitamins, and minerals.) The analysis also reported that large eggs now contain 41 IU of vitamin D, an increase of 64% over the last recorded analysis in 2002. "This news about the lower cholesterol levels and increased vitamin D in eggs can only benefit formulators already relying on further processed eggs for their impressive range and performance as highly functional ingredients," said Mitch Kanter, Executive Director of the Egg Nutrition Center. And, in particular, breakfast, because of its use of eggs and potential new breakfast products, can benefit from the breaking news.

Evolving Grains

Breakfast foods have undergone a nutrition transformation in the past few years, noted Steve Hodge, Senior Executive Chef for ConAgra Mills, Omaha, Neb. (phone 402-240-5153, www.conagramills.com). While traditional items such as cereals, pastries, and breakfast sandwiches are still category leaders, it's much more common to see whole-grain varieties of these foods on grocery store shelves. "And now we're starting to see other foods including pancakes, waffles, bagels, and flatbreads catch up to the whole-grain trend," he observed. "One of the reasons behind this change is the proven positive effect whole grains have on health, especially in areas of weight and diabetes management."

Hodge pointed out that breakfast foods in retail are a great example of the evolution toward more whole grains and better nutrition profiles. "Many retail manufacturers have adopted a stealth health approach—adding in ingredients such as *Ultragrain*[®] whole wheat flour, which delivers whole-grain nutrition with little or no effect on the taste, texture, and appearance of mainstream breakfast foods," he said. "Other manufacturers have embraced the culinary appeal of whole multi-grain ingredients—you see this in particular with ConAgra Mills *Ancient Grains*, which tell a great label story and add exciting tastes and textures as well as whole-grain nutrition." Part of the reason retail has done so well in this arena is the ability to market the nutrition benefits of whole grains on the package to consumers concerned with weight or diabetes management, Hodge emphasized.

According to the chef, many of ConAgra Mills' customers who are developing products for this category are also working with *Sustagrain*[®], an all-natural whole grain with three times the fiber of oats. When it comes to glycemic index, this

ingredient's high fiber and low starch helps it rank among the lowest of commercially available grains, smoothing out spikes in blood glucose and insulin responses that may play a role in the development of Type 2 diabetes. "The best part about *Sustagrain* is that it can be added to an unlimited variety of product applications—from traditional grain-based

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foods to meat applications.”

The company offers a formulation for a *9-Grain Waffle* that features a mix of ancient grains (amaranth, millet, quinoa, sorghum, teff, rye, and oats) along with *Ultragrain* and *Sustagrain*. The blend of grains provides flavor, added texture, and nutritional value, and when served with a low-calorie syrup, may be suitable for individuals with weight management or diabetes concerns.

Sorghum flour from ADM, Decatur, Ill. (phone 217-424-5200, www.adm.com), may be used in the development of better-for-you breakfast foods. For example, the company has available a white sorghum flour and a whole-grain sorghum flour, both of which can be used in the creation of whole-grain sorghum pancakes. The flours provide a neutral flavor, pleasing mouthfeel, and a light tan color. With the addition of this ingredient, the gluten-free pancake requires few formula changes.

In addition to its recently introduced sorghum flours, ADM offers a variety of other ingredients that can provide nutritional and functionality benefits in breakfast foods. A *Date & Almond Breakfast Bar* can be created using the company's *VegeFull*™ navy bean powder as well as *Prolite* wheat protein isolate and *NovaLipid*™ soybean oil. The addition of *Prolite* as a partial egg replacer can also improve the overall quality of fresh baked or frozen waffles and pancakes. The wheat protein isolate promotes softness while adding resilience in systems requiring structure.

At present, barley is not a common breakfast ingredient, but according to Canada-based Alberta Agricultural and Rural Development (phone 403-742-7901, www.agric.gov.ab.ca), the grain has great potential given its functionality and nutritional profile. Researchers worked on a product development project to add a whole-grain hullless barley flour to an extruded breakfast cereal while maintaining final product quality and functionality. The extruded product is low in moisture, crisp, and ready for flavors or coatings.

Hand-held breakfast sandwiches continue to be a popular choice among busy consumers. Restaurants and foodservice operations are continuing to introduce healthier breakfast sandwich options with egg whites and turkey sausage, for example. A whole-grain croissant would be a suitable addition to the menu, noted Watson Inc.,

West Haven, Conn. (phone 203-932-3000, www.watson-inc.com), which developed *Perfect Grain*™, a wheat germ and wheat bran that has been micronized so fine that it is indiscernible from flour. The ingredient can be used to replace 18% of the flour in a formulation, giving the baker increased flexibility. With a particle size under 5 microns, it will not interfere with the light and flaky texture of a breakfast croissant or other delicate baked goods.

Berries and Breakfast

The earliest written account of a pancake reportedly dates back to 1430. This breakfast item comes in different variations—one of the most popular ones is blueberry pancakes (although chocolate chip is also popular, and I even heard that some people add *M&Ms* to their pancakes formula). But I digress.

The addition of blueberries to pancakes (especially whole-wheat versions), can make for a very flavorful (as well as healthier) combination. To help celebrate the pairing of blueberries and pancakes, January 28, 2011, was designated as National Blueberry Pancake Day.

Of course, pancakes are not the only application to flip for when using fruit. Formulations such as *Dessert Waffles with Spiced Blueberry Sauce* may provide a tasty way to bridge conventional breakfasts with the indulgent dessert category. Imagine serving chunks of waffle, spiced blueberry sauce, and a blueberry



A berry to flip for? Because of their flavor, color, and nutritional benefits, blueberries can help recreate breakfast foods such as pancakes, giving them an added indulgence. In such an application, they can partner with an ingredient such as whole grains, stacking breakfasts toward better health.

Photo courtesy of Driscoll's

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Highly process tolerant and easy to incorporate into the production process, dried cranberries can deliver attractive points of color, taste, and health profile to a breakfast bar—a particularly convenient food to eat before your p.c. in the a.m.

Photo courtesy of Ocean Spray Ingredient Technology Group

yogurt in a glass for breakfast.

Portable, on-the-go breakfast foods can be created utilizing the benefits of blueberries as well. The products can range from new breakfast bar concepts to *Blueberry Biscuit Sticks*, the latter prototype featured at the 2010 IFT Food Expo by U.S. Highbush Blueberry Council, Folsom, Calif. (phone 650-824-6395, www.blueberry.org). The user-friendly shape of the biscuit makes it easy to handle and incorporate in quick breakfasts. Blueberries are a natural way to add antioxidants while keeping the product moist and boosting flavor and mouth-watering appeal. Wild Blueberry Association of North America, Old Town, Maine (phone 207-570-3535, wildblueberries.com), also offers a number of potential breakfast formulations, such as *Wild Blueberry Smoothie*, *Quinoa Salad with Wild Blueberries*, and *Wild Blueberry Bran Muffins*.

The different blueberry formats available year round provide breakfast developers a variety of choices to suit any need. For example, freeze-dried blueberry ingredients are available from Van Drunen Farms, Momence, Ill. (phone 815-472-3100, www.van-drunenfarms.com). During freeze drying, the cell structure of the berries remains intact, preserving the nutritional value, color, flavor, and piece

identity of the product better than other drying methods. Freeze-dried blueberries—in whole, sliced, diced, and powdered forms—can be added to granola, breakfast cereal, oatmeal, pancake mix, bagels, muffins, scones, breakfast bars, drink mixes, and other breakfast applications.

Cranberries are another berry that is popular for breakfast. Cranberry juice blends immediately come to mind. Ocean Spray Ingredient Technology Group, Lakeville-Middleboro, Mass. (phone 617-283-1578, www.oceanspray.itg), offers an extensive portfolio of dried cranberry ingredients for use in cereals and cereal bars. These ingredients include sweetened dried cranberries (SDCs) at varying moisture levels and sizes; low-moisture and glycerated varieties to avoid moisture migration; and diced and double diced options, which offer high piece count for cereal and granola bars, adding evenly spaced, smaller points of color. The company also recently introduced its fruit-sweetened dried cranberries, which offer the same processing advantages as its soft and moist SDC while removing the need to call out sugar as an ingredient. Highly process tolerant and easy to incorporate into the production process, these ingredients provide an innovative way to deliver attractive points of color, taste, and a healthy profile to finished breakfast foods.

Freeze-dried or drum-dried cranberry ingredients from Van Drunen Farms provide a convenient way to add real cranberry flavor and functionality to a variety of breakfast foods, including cereals, bars, smoothie mixes, and bakery items. The freeze-drying process preserves the cranberry's natural color, shape, flavor, and nutrients. The drum-drying process negates piece identity, but it also retains much of the cranberry's original flavor, color, and nutritional value, and at a lower price.

Adding Fiber to Cereals

After experiencing flat and almost declining growth rate for some time,

the cereal category has been rejuvenated by the addition of fiber, noted Lorraine Niba, Business Development Manager—Nutrition, National Starch LLC, Bridgewater, N.J. (phone 908-575-6243, www.foodinnovation.com). Cereal is now the top category for added fiber in the U.S.

The Packaged Facts' 2010 U.S. food fiber report shows that in the five-year period from 2005 to 2009, the highest proportion of products introduced with fiber were breakfast cereals and cereal bars, with these two categories accounting for 14.8% of the total products launched in 2009 with fiber. Furthermore, consumer surveys indicate that an awareness of fiber and its benefits is high among American consumers. According to the 2009 IFIC survey, up to 89% of consumers were aware of the relationship between fiber and digestive health; 56% of consumers were already consuming fiber for digestive health; and 78% of consumers were aware of the relationship between fiber and weight management.

National Starch has worked with several key cereal manufacturers to add soluble fiber to their products, including major cereal brands for kids as well as specialized cereals for adults. The company currently offers both corn- and wheat-based prebiotic soluble fiber, *Nutriose*[®], which is manufactured by Roquette. "The ingredient's superior functionality properties—ease of mixing, extrusion and process stability, and minimal taste or flavor impact—make it suitable for adding fiber to low-moisture food systems such as breakfast cereals and cereal bars," said Niba. "The ingredient can also be used in combination with other fibers, enabling food manufacturers to make fiber-related claims on their products."

Since formulating with fiber can often be challenging, the company offers technical service and formulation assistance, working with cereal product developers throughout the formulation and scale-up process. "With cross-functional go-to-market teams to meet customer needs,

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National Starch differentiates itself as a supplier for a challenging, but extremely attractive and now rejuvenated category," Niba added.

Nuts for Breakfast

Significant opportunities for almonds in breakfast foods were recently highlighted in a *2010 Breakfast Outlook Study*. The research project, commissioned by the Almond Board of California, Modesto, Calif. (phone 209-549-8262, www.almondboard.com), focused on the breakfast consumption habits of consumers in North America.

The study found that cereal and granola accounts for more than a third (35%) of all breakfast occasions—the equivalent to approximately 21 billion occasions in North America. More than half of consumers prefer to eat cereal with nuts, and those who eat cereal with

nuts report that they believe the cereal tastes better, is more filling and nutritious, and has a better crunch.

The benefits that almonds bring to cereals—and other breakfast foods—present a growing opportunity for manufacturers. According to the study, North American consumers rate almonds as the nut eaten most often at breakfast, the most preferred nut at breakfast, and the best fit in breakfast foods vs other nuts.

Almonds are available in a variety of forms, including sliced, diced, ground, and butter form. Sliced, diced, and ground are common forms for cereals while piece forms are frequently used in granola applications. Almond butter can be used to fill breakfast breads and rolls before and after baking. Roasted almonds are said to complement the flavor and

texture of whole-grain bread formulas. Because of almonds' versatility, they can be tailored in the creation of portable or breakfast-on-the-run foods.

Nutritionally, one serving of almonds (28 g) provides a good source of dietary fiber, 6 g of protein, and 14 g of fat (most of which is unsaturated). Because of its nutritional makeup, almonds can help consumers feel more satiated—a key consideration for those interested in weight management.

Using Dairy at Breakfast

A cheese-filled *Breakfast Bite* prototype, developed at the Wisconsin Center for Dairy Research, demonstrates how dairy ingredients can contribute to improved taste, functionality, and nutritional benefits in the evolving category of breakfast foods. The prototype, highlighted by



Consumers rate almonds as the nut most eaten at breakfast. This popularity, along with the taste, texture, and nutritional benefits that almonds bring to cereal, presents growing opportunities for manufacturers.

Photo courtesy of the Almond Board of California

U.S. Dairy Export Council (USDEC), Rosemont, Ill. (phone 717-704-1050, www.InnovateWithDairy.com), at the 2010 IFT Food Expo, serves as a portable, protein-packed, lower-sodium breakfast for people on the go.

Protein content is often low in breakfast meals. Studies have shown, however, that consuming protein at breakfast can help balance protein intake throughout the day. Nutritional studies also reveal that higher-protein diets can increase satiety or a feeling of fullness. The *Breakfast Bite* prototype reportedly has 70% more protein than similar cheesy on-the-go products in the marketplace (21 g of protein per serving vs 12 g). Furthermore, whey permeate in the prototype enhances flavors and salt perception, allowing for a reduction of 40% in added salt (from 480 mg per serving to 270 mg) while improving surface browning and providing a clean dairy flavor. The dough of the prototype is fortified with whey protein concentrate, and the cheese filling provides a distinct and exciting flavor. Other ingredients in the formula include milk protein concentrate, which adds protein and calcium and helps build body and texture of the bread, and nonfat dry milk powder, which helps build body and texture of the bread and

contributes to browning of the crust.

Granola/cereal bars for breakfast may be formulated with the *PowerProtein* line from Fonterra Inc., Chicago, Ill. (phone 847-928-1869, www.fonterra-northamerica.com). This line of protein, specifically made for use in bars, is said to overcome the challenges (poor taste, hardness, and chewiness) associated with developing high-protein products. The ingredient line combines the nutritional advantages of dairy protein with those of functionality, texture, and flavor, adding a sense of indulgence to the overall product.

A whey protein ingredient from Grande Custom Ingredients Group, Lomira, Wis. (phone 920-269-7188, www.grandecig.com), can provide breakfast protein bars with an appealing crunchy texture and mild, milky flavor profile. The ingredient, *WPCrisp*[®], helps bar manufacturers address taste and texture challenges while providing nutritional benefits.

Access to a patented technology for producing lactose-free dairy products with a real milk taste is offered by Denmark-based Arla Food Ingredients (phone +45 89 38 10 00, www.arlafoods.com). The filtration technology has the ability to separate half the lactose out of milk by purely mechanical means without any changes to the milk's composition. Addition of lactase—the enzyme missing from the digestive systems of lactose-intolerant consumers—then splits the remaining content into glucose and galactose. By splitting the lactose into two monosaccharide components, the final product gains the same sweetness as standard milk.

'Sticking' with Breakfasts

The different directions that breakfast can take were demonstrated by a number of prototypes created by Wixon Inc., St. Francis, Wis. (phone 414-769-3000, www.wixon.com), using ingredient systems from the company's portfolio. For example, *Omelet Sticks* is a golden fried portable breakfast of reduced-sodium turkey bacon, wrapped in seasoned potatoes and infused with a butter herb seasoning. This indulgent breakfast on the go is served with *Maple Brown Sugar*

Ketchup, made with *Mag-nifique*[™] *Sugar Lift Technology* to enhance sweetness perception. A similar product, *Omelet Bites*, is a portable breakfast of Canadian turkey bacon and cheddar cheese infused with a butter and herb seasoning, and served with *Chimichurri BBQ* and *Maple Brown Sugar Dipping Sauces*.

A *Breakfast Egg and Cheese Sausage Stick* (and a *Bacon Breakfast Egg and Cheese Sausage Stick*) is also suitable for on-the-go appetites. Made with real eggs, both versions were developed with *Wix-Fresh* technologies. These flavor modifiers enhance, mask, and stabilize protein products' natural color and flavor while extending shelf life.

The company also developed breakfast prototypes that contain stevia and *Mag-nifique for Stevia* (a taste modifier which reduces the bitter aftertaste that can occur when stevia is used at high concentrations). Examples of prototypes include *Maple Breakfast Sausage*, a no-sugar, high-protein version of the favorite breakfast side, which has a touch of maple, making it rich without adding extra calories, and *Slim Apple Cinnamon Quick Bread*, a no-sugar-added quick bread mix that has an apple flavor with a hint of cinnamon.

New Breakfast Cultures?

The development of new cultures may help diversify yogurt products, expanding opportunities for their application, especially at breakfast, where yogurt is a popular food.

In response to ongoing demand for increased variety in the yogurt sector, the Netherlands-based DSM Food Specialties (phone +31 0 15 279 26 85, www.dsm-foodspecialties.com) extended and optimized its *Delvo-Yog* range of cultures. This versatile portfolio offers yogurt manufacturers the flexibility to create the flavors, textures, styles, and functional options that consumers desire.

A new line of cultures from Denmark-based Danisco (phone +45 32 66 20 00, www.danisco.com) reportedly can produce yogurt with low post acidification in different processing and storage conditions. These cultures (*Yo-Mix*) were developed to ensure that taste remains

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mild throughout the product's shelf life despite processing and storage conditions. Yogurts made by these cultures are said to have a very pleasing flavor, a high level of viscosity and short texture, and limited post acidification under a wide range of temperature conditions.

A range of cultures specifically for drinking

yogurt were launched by Denmark-based Chr. Hansen (phone +45 45 74 74 74, www.chr-hansen.com). The cultures make it possible to ensure optimum quality in terms of smoothness and mouthfeel, with the potential of removing starches and other thickeners. Available in three different flavor profiles, the cultures allow products to be created that are lower in fat and sugar while at the same time achieving optimum flavor and texture.

Concentrated Flavors Help Start the Day

A natural bacon flavor concentrate from Butter Buds Food Ingredients, Racine, Wis. (phone 262-598-9900, www.butterbuds.com), has potential in breakfast items such as quiche, scrambled eggs, poultry-based or vegetarian sausage, biscuits, pancakes, syrup, and other applications where bacon or bacon bits are used for visual effect but may be lacking in flavor. The ingredient, *Butter Buds Bacon™*, imparts a natural bacon flavor along with a fatty richness and mouthfeel.

This latest addition is produced with the same proprietary technology used to make the company's other natural concentrates, including coconut butter, dried cream extract, and dried cream extract and other dairy-based products. These concentrates have application in omelets, instant breakfast drinks, flavored coffee creamers, pancakes, waffles, toaster pastries, extruded cereals, oatmeal and other hot cereals, grits, biscuits, muffins, sweet rolls, Danish pastry, cake donuts, yeast-raised donuts, *Nutella*-type spreads, icings, granola, and English muffins.

Raisins Add New Chapters to 'Cereal' Products

California raisins may be used in a variety of cereal-based products including ready-to-eat breakfast cereals, granola, mueslis, and cereal bars. According to the California Raisin Marketing Board, Fresno, Calif. (phone 559-248-0287, www.calraisins.org), the ingredient offers a fruity flavor, low water activity, and nutritional value, and can be coated easily and prepared for inclusion in cereal products.

Today, many new breakfast cereals contain several different kinds of grains, which are then combined with a variety of other ingredients such as nuts and raisins. With their dietary fiber, antioxidants, inulin, vitamins, and minerals, raisins complement well the health benefits of these other ingredients. Consider, for example, pairing raisins with cholesterol-lowering oatmeal.

When used in paste form, California raisins have the ability to provide cereal product manufacturers with an entirely different range of advantages. Although paste still retains all the



As breakfast choices evolve, "starting the morning right" will take on new meanings, especially within the context of this century and the health challenges that it faces.

Photo courtesy of Stern-Wywiol Gruppe

nutritional benefits of whole raisins, paste can function as a binding agent in cereal bars. In addition to adding color and sweetness, it is extrudable and can be used as a filling ingredient. It has shelf-life extension properties, and acts as a sweetener, humectant, and flavor enhancer. Ground raisins and raisin paste are also used as fat replacers in selected bakery products suitable for breakfast.

Nothing 'Fishy' About Breakfast Benefits

A vegetarian omega-3 ingredient, *Lyc-O-Mega 10 AL*, may be used to fortify breads, baked goods, crackers, and other breakfast foods. Launched by Israel-based LycoRed Ltd. (phone 972-7-32327500, www.lycored.com), the microencapsulated product provides the health benefits of omega-3s but with a bland taste that will not affect the quality of the finished application.

This vegetarian form of omega-3, unlike fish oil, has the advantage of being both sustainable and suitable for vegetarians as well as children who are more sensitive to taste. The microencapsulation technology enables fortification of baked goods which traditionally could not be fortified with omega-3.

Starting the Morning Right

Depending on your individual preference, a number of breakfast options are available. The photo on this page shows just a few examples that could be applicable for this particular eating occasion—orange juice, yogurt, cereal, egg, hot tea with toast and

jam, whole-grain bagels and muffins, cold cuts, and fresh fruit. And, of course, there are many other choices that are becoming especially popular today such as breakfast pizzas, tortillas, egg sandwiches, whole-grain waffles and pancakes, breakfast desserts, and so on.

It has been said that breakfast is the most important meal of the day. And as the breakfast category continues to evolve, the phrase, "starting the morning right," will take on new meaning, especially within the context of this century and the health challenges that it faces. For example, breakfast becomes a better opportunity for higher protein intake, provided by such ingredients as eggs, dairy, soy, and meats. Consuming more protein at breakfast can provide a number of benefits—the increasing of satiety or a feeling of fullness, the balancing of protein intake throughout the day, and the leveling out of blood sugars. All these advantages can help in the management of weight as well as related problems such as diabetes.

Ingredients for breakfast foods can truly provide a very distinctive wakeup call (from taste and nutritional perspectives) and do this regardless of the economy and its effects.

Anyone for a gluten-free breakfast cookie? **FT**

Next month's Ingredients section is a virtual "potato potpourri," taking a look at what's new with potato-based derivatives, applications using potatoes, and different flavor pairings and this tuber.



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