Baking Those Delicious “Good-for-You” Products

Is it possible to have your cake and eat it too—to eat something that you can’t get enough of and is good for you too? This question really relates to how you define what is good for you. Combine sugar, fat (preferably butter), eggs, and flour and add flavor, salt, leavening, chocolate, or fruit and bake it and you can make at least one thing that will be on most people’s top 10 list of favorite things to eat. For those things that you just can’t rationalize as being good for you, you can always fall back on “it’s good for the soul.” This works for me—we all deserve or need a treat from time to time. In this column I will explore some “good-for-you” options for baked products.

Adding To or Taking Out

A “good-for-you” product can be enhanced in two ways—either by adding something to increase it’s health benefits or by taking out some of the components that are bad for you. For a time, the focus was on what could be taken out. The trends have been low or no fat, reduced sugar or sugar-free, reduced saturated fats and no tropical oils or trans-fats, low cholesterol, low sodium, low carbohydrates, and gluten-free. It seems the only thing we haven’t tried is to create low-protein products.

The other way to make something better for you is to add beneficial things to it. This can be more challenging, and more education and research are needed to succeed. Common ingredients to add include whole grains, fibers, proteins, flaxseed, omega 3 fatty acids, β-glucan, and fruits. There are a myriad of other options as well. The challenge in adding components is often the price point.

Ingredients to Take Out

Gluten is currently a hot item that is especially challenging to take out. Part of the challenge is that all the gluten needs to be removed, and gluten provides the foundation upon which cell structure is built in baked products, providing texture and cohesiveness. In short, gluten must be replaced with other proteins, such as whey, pea, soy, or egg, to help build structure. Gums are added (e.g., xanthan) to help create films that will hold leavening gases and maintain cohesiveness so the product isn’t too crumbly. Starches or gluten-free flours also are added (e.g., rice, tapioca, potato, and pulse starches and flours) that will gelatinize at typical baking temperatures and produce good cell structure.

Carbohydrates are another popular component to take out of baked products, although not as popular as in the early 2000s. To reduce carbohydrates, you have to look at methods of reducing the two mainstays of baked products: flour and sugars.

To reduce the carbohydrates contributed by flour, protein is increased using a stronger, higher protein flour or more egg, soy, or whey proteins, which also requires (to maintain a similar level of tenderness) that the amount of flour in the product be decreased and the level of tenderizers, such as fats, sugar substitutes, or resistant starches, be increased.

To reduce sugars, fats can be increased, or alternative ingredients can be used that function like sugars, such as fibers or sugar alcohols. Fibers include inulin (e.g., chicory root fiber), polydextrose, maltodextrians, and corn fiber. The challenge with fibers and sugar alcohols is the effects (intestinal gas production and bloating) they can have on the consumer. These ingredients all effect individuals differently and to different extents. Using these types of alternative ingredients can help lower sugar levels and boost fiber levels that can be listed on the Nutritional Facts panel; in the case of sugar alcohols, it may be required that you list the amount(s) per serving as well. They also can help lower the calorie content of the product, as most contribute fewer calories than the typical 4 cal/g.

Sodium reduction is a big market of late, there are several options, depending on the source in the product. The big sources in baked products are either salt added for flavor or yeast control and the leavening system. For use in the leavening system, there are several low- or no-sodium baking powders available. They are used to replace sodium “whatevers” with calcium “whatevers.” There are several approaches to salt reduction. The most common is cutting sodium chloride levels by incorporating potassium chloride. The challenge is to mask or minimize potassium chloride’s bitter flavor. In cases in which salt is used to control yeast in the formulation, potassium chloride is the best alternative. When salt is used mainly as a flavor enhancer, products with an increased surface area or smaller granulation can produce a saltier flavor while less sodium is actually used. Another option is to add flavors to mask the flatness of lower salt levels. Or, as my wife, the dietitian, would say, “simply cut the amount of salt used and get used to it—we generally consume too much salt anyway.”

Fat is another fun challenge for baked good formulations. How challenging reducing fat is depends on the product. Fat provides softness and tenderness in baked products. The best solution for most baked products is to add emulsifiers. Mono- and diglycerides are the best emulsifiers for providing the shortness fat would typically provide. “Softer” mono- and diglycerides, 50–70 IV (iodine value IV, a measure of the saturation of the fatty acids), work well in products in which the shortness and emulsification of water and oil are required. “Harder” monoglycerides, typically ≈5 IV, distilled, and 90% monoglycerides, are made up almost completely of fully saturated fats and are good alternatives for products that require tenderness and aeration, such as cakes. In breads, distilled monoglycerides work well for slowing the staling process and making the bread tender. Emulsifiers such as sodium steryl-2-lactylate provide softness and strength and produce a finer cell structure in bread.
Adding the Good Stuff

With all the ingredients that can be added to make a baked product better for you, it’s like being a kid in a candy store. The challenge is to find ingredients that will withstand the baking process and have the required shelf life afterward. Ingredients that can be added include proteins, fibers (prebiotics), probiotics, omega 3s, whole grains or seeds, antioxidants, fruits, vegetables, nuts, and vitamins, to name only a few.

Fiber enrichment is a popular trend. Of the available fibers, inulin products are the easiest to incorporate into products, which has led to their massive growth in popularity. Generally, granulated sugar can be replaced at a 1:1 ratio with fructooligosaccharides (FOS) that are 2–5 glucose units long. Liquid versions of inulin also work as well or better than high-fructose corn syrup (HFCS) for keeping products soft. The downside is the effects (intestinal gas production and bloating) they may have on the consumer. Manufacturers maintain the body adjusts to inulins; personally, mine has not found that happy place yet.

Another easy-to-use fiber is maltodextrin. Maltodextrin doesn’t seem to produce the negative effects, at least on me, that inulins do. It also helps keep products soft. Another popular fiber is polydextrose. This is a low-cost dry fiber option but is not as easy to work into product formulations. Polydextrose seems to interfere with the structure of products, knocking them down and gumming them up. One thing all of these fibers have in common is that they don’t absorb water. They are suitable for applications in which water activity is important, like bars and cookies.

Finally, there are fibers, mostly insoluble fibers, that do absorb water—sometimes lots of water. These work well in breads, providing increased absorption and improving dough yields. The challenge is balancing the fiber, water, absorption, and bread structure. Fiber tends to reduce volume and can mess up cell structure. Higher water content also can cause quicker molding, so more mold inhibitor is needed, or the product must be kept frozen.

Protein seems to be the next big up-and-coming add in. In chemically leavened products, the absorption properties of proteins determine which ones will work best. Most absorb water well, which throws off the rheology of chemically leavened doughs. Some protein sources to look at are whey, milk, and soy isolates and concentrates, and pea and rice proteins. In addition to water absorption, there is also the challenge of the effects high levels of protein have after baking. Proteins denature or crystalize and hold the water they absorbed, increasing water activity, and they tend to harden relatively quickly, even with higher moisture contents; I am still looking for methods to soften them. Another thing to watch for are flavors. Some, especially hydrolyzed proteins, can have funky flavors.

Whole grains is another popular trend. Manufacturers generally are looking to add some or switch totally to whole grains. The question is what should be considered a whole grain? Should they include just the seeds from grass species and those that are traditionally milled into flour, or should they include oilseeds like sunflower or flax, and what about legumes like lentils, chickpeas, and beans? Many seeds and legumes offer better nutritional profiles than traditional whole grains. The FDA drafted guidance on whole grain label statements in 2006 (Fed. Reg. 71(33); docket 2006D-0066) but has not yet published final guidelines.

The challenges encountered with whole grains are similar to those observed with fiber—water absorption and impact on product structure. There is typically some reduction in product volume, so proper selection of white (refined) flour or structural system is critical to preserve desired volume and texture.

Fruits and vegetables are another favorite method of enhancing product nutrition. Dried or infused fruits and their antioxidant properties are relatively easy to incorporate. Apples and raisins are typically the most cost-effective favorites. Some others that can be cost-effective as well are infused papaya, mango, apricot, and pineapple core. Blueberries and cranberries are less cost-effective but are very popular and loaded with antioxidants. One question I have is how well do antioxidants hold up in these fruits when baked? I’ve spoken with vendors, and the answers aren’t very clear. I do know, however, that when extracted and baked many of the antioxidants do not survive.

New dried fruits and vegetables have appeared on the scene in the last few years and have been incorporated into many products. Calculating that the reconstituted weight of dried vegetables and fruits to their normal moisture levels, usually in the 80–90% moisture range, it is possible to incorporate half to full servings of fruits and vegetables into baked products. What makes it possible is the fineness or grind of the product. For example, apples and many vegetables can be found and used in forms that are almost flour-like. This enables them to be combined with the flour and dough matrix more easily, in contrast to larger evaporated pieces that dilute the dough matrix because of their large surface areas and cause bars and cookies to break apart. Larger amounts of large inclusions also make it very difficult to extrude dough—the dough just doesn’t flow. From experience with cookies, bars, and slabs, I can tell you that the dough gets as far as the end of the die and then packs like concrete incredibly quickly. It is best not to have maintenance around when you start one of these up and to have your finger on the stop button.

Omega 3s are another hot “good-for-you” ingredient that can be added to enhance products. They do have challenges, however. Most omega 3s are sourced from fish and impart a noticeable “fishy” aroma to baked products. The aroma can be minimized through the use of encapsulated omega 3s and by adding them to products with a shorter shelf life, such as breads. For bars and cookies, which have an expected shelf life of 6 months, you may have more success using algal oils; they are more expensive, however. DHA and EPA omega 3s have more health benefits than ALA. Until recently, ALA omega 3s, which are found in flaxseed and are much easier to work with, were thought to be less bioavailable. Recent research, however, has given us a better understanding of how the body converts ALA into DHA. Findings suggest our bodies may be better at using ALA than was previously thought. As it stands now, to claim a product as an excellent source of omega 3s, it must contain 320 mg of ALA or 32 mg of DHA and EPA. The benefit of flaxseed is that it adds a pleasant flavor to products and does not impart a “fishy” aroma as it ages.

The list of ingredients that can be added to enhance the “good-for-you” qualities of baked goods is almost endless. I am sure I have left out some favorites here. Knowing or learning how well specific ingredients, and their beneficial components, survive the baking process remains the biggest challenge to determining what can or should be added.

Eat Less

As the old adage goes, we are what we eat. For many of us, there is just too much of us. We simply eat too much. Although we can’t eat our way to good health, what we do eat can make us healthier.