

## Transforming 21st Century Candy

By Martin Schultz, Contributing Editor

For both the 6-year-old and the 60-year-old, color, texture and how long flavor lasts are the “all and everything” ever desired in candy. Yet even in this time-honored food category, traditions are changing.

Nutritionists, food-product designers, ingredient scientists and food processors are all intimately involved in today’s candy metamorphosis. The result is a process of constant change, with chocolate, chewing gum, jelly beans and gummy bears morphing into platforms for the conveyance of flavors and colors, and nutraceutical cargoes.

### Fruitful flavors

So it is not surprising to find the category in a tremendous state of flux. Take flavor, for example. From traditional toffee to Indian sweets, manufacturers are furiously experimenting with a huge new battery of flavor options in a frantic search for the next hot taste.

Fruit has always played a critical role in candy flavorings. While traditional fruit flavors, such as strawberry and orange, are commonly available, manufacturers are now thinking outside the crate and experimenting with a host of different flavors—some combining the exotic with the tried-and-true, others going for the pure flavor of the new and fresh.

“We’re seeing increased interest in more exotic flavors than before. We will never replace the standards like strawberry, cherry and grape, but the palette of flavors is definitely expanding,” says Michelle Huber, senior flavorist, sweet flavors, Mastertaste, Teterboro, NJ. “Children are interested in new and different flavors. I find that the acceptability of a new product hinges on the proper pairing of flavor with application rather than just the flavor alone.”

Of course, blending of conventional fruit with exotic fruit flavors is not new: Manufacturers were combining strawberry-kiwi 15 years ago. As Huber sees it, in many instances flavors for confection have migrated to the category from beverage, which historically has been on the cutting edge of experimentation. The so-called “super fruits”—açaí, pomegranate and mangosteen, for example—which contain serious antioxidant clout, mushroomed in popularity when marketed as “power” juices. “Who would have thought that green tea would be as popular as it has become in sweet applications? We have seen a definite increase in requests for these types of flavors for confections, as well as dairy applications,” says Huber. “Foods which provide unique health benefits are good indications of where we should look next when developing new and different flavors.”

Indissolubly linked with recreational culture in general, flavors not only migrate from one food category to another, but also just as quickly go in and out of fashion. “Sixty years ago, anise went out of style,” says Steve Wolf, director, flavor applications, Robertet Flavors, Piscataway, NJ. “Now it’s coming back, as are other flavors once thought too conservative for modern tastes.”

Wolf points to indulgence as extremely potent in confection flavors: “Indulgent is coming back strongly, because it ties in very nicely with the confectionery category. We’re seeing cream and buttery notes making much more impact in butterscotches and toffees, as an example. High-end chocolate is doing very well,” especially because of the health buzz about dark chocolate.

Dulce de leche is another example of a fast-growing candy flavor that, according to Wolf, is seen in everything from ice cream to chocolate filling.

For flavorists like Huber, the challenge involves managing an ever-closer relationship between ingredient producer and food processor. "When we design flavors, we need to understand the application," she says. "This includes the ingredients being used, as well as the processing parameters. Innovations in ingredients and processing equipment have opened up new avenues for our customers to explore. We need to work closely together to make the end products the best they can be."

## **Multicolored candy**

Besides flavor, color is also playing a significant role in the transformation of candy. Marketing candy demands color precision, requiring, for example, developing the right shade, tone and intensity for kids and others for adults. Kids like bright colors, adults prefer more-shaded tones. Either way, colors and flavors must complement each other. For example, a sugared lemon slice should obviously always be bright yellow and have a hint of lemon flavor.

It wasn't so long ago that candy manufacturers avoided natural colors because they were harder to work with than synthetic colors. Natural colors were less stable in low-pH environments, for example, and broke down more easily when exposed to intense light and heat conditions. These and other processing problems led to costly manufacturing failures, including wide variations in final color. For decades, manufacturers preferred synthetic colors, which were standardized and nearly always performed as specified.

With new technologies now available, manufacturers have found ways to overcome the greater complexities of using natural colors, such as ensuring consistent color matching with the target group's perception. In fact, candy processors are showing a growing preference for natural colors, due in large part to rising consumer demand for less-processed, "more natural" ingredients.

The result is that more and more so-called "natural" colors are finding their way into confectionery. Many are derived from fruit and vegetable extracts. An example is the anthocyanin pigment group derived from fruits like grapes, black currants and elderberries. These pigments provide candy with hues ranging from red through blue to purple, and to broaden their application, increased-stability forms have been developed and are commercially available.

A host of fruit- and vegetable-derived extracts used in color ingredients have already made a big impact on the market, and more are in the pipeline. Processors outside of the United States requiring a natural color green, for example, are discovering the virtues of chlorophyll (chlorophylls from green vegetables are not permitted as colorants in this country), which in extract form has the added convenience, for some applications, of oil solubility.

Need a vivid lemon-yellow? Food processors can turn to turmeric, used for millennia in India as a spice in curries. For orange-red, try paprika. For yellow-orange, annatto is becoming the color of choice. A wide spectrum of naturals is available with improved stability; just make sure they stand up to the rigors of the specific application and product storage.

## Improved holding patterns

Maintaining flavor for the duration of consumption or, more an unexpected explosion of taste. Stabilizing natural colors or holding the color for as long as possible. These are a few of the technical challenges candy manufacturers face.

Candy manufacturers often use coatings and additives to provide several functional benefits, perhaps the most important of which is the timed release of an ingredient. A popular strategy is to administer coatings through micro-encapsulation, which chemically surrounds active ingredients with a protective shell.

Various benefits accrue when including microencapsulated ingredients in candy products. For one, micro-encapsulation controls particle size more precisely and, therefore, enables better handling, scaling and incorporation of colors—both natural and synthetic —into candy systems. And since many candy products tend to be water-based, micro-encapsulation of colors can offer additional advantages with pigments that are not water-soluble.

Flavor-system management is vastly improved for much the same reason, with accurate control of duration of flavor and the timing of flavor release. “Sometimes, what you want is to give the consumer a sudden and massive hit of flavor,” Wolf suggests, “which is what you’d get eating one of the micro-mint breath fresheners.” On the other hand, with chewing gum, one requirement is to prolong the flavor, another function of micro-encapsulation.

“The flavor industry has become more active in finding new and novel delivery systems and ingredients that give the confectioner an added level of control over flavor release and duration,” says Huber.

“Microencapsulated flavors and raw materials engineered to provide specific taste effects; these are all very active areas of development in our industry.”

Whether to use a time-release, temperature-release, moisture-release or maceration-release flavor will depend on several factors, including the type of candy and flavor desired, the complexity of the process involved and, of course, cost.

Flavor companies provide more than just flavors. Flavor companies try to provide the confectioners with a point difference. “We are constantly looking at our new flavor trends and seeing how we can pair this with new delivery systems and new raw materials to make something novel,” says Huber.

## Nutritional impact

Color control and flavor release are not the only benefits to be derived from microencapsulation. Candy producers are becoming just as excited over the use of candy as a platform for nutraceutical and pharmaceutical applications.

With parents increasingly focused on their children’s nutrition, microencapsulation offers an opportunity to create a device for conveying vitamins and essential minerals to kids who would otherwise find ways to avoid them. Yet even though adult consumers are demanding more nutritionally beneficial candy products, the flavor of certain nutrients, for example trace minerals, remains a powerful barrier. The flavor issues surrounding the mineral fortification of chewing gum are relatively easily overcome by microencapsulating the product in a kid-friendly and flavorful gum. The slow release of the essential minerals and vitamins within a flavor system satisfies the child’s yearning for flavor while masking an underlying purpose of the product.

Yet while the United States is only slowly accepting the nutraceutical value of microencapsulated candies, the Netherlands has embraced the market. Medicated confectionery has become one of the most rapidly expanding segments of the overall Dutch confectionery market. Functional chewing gums have become a growing staple of the health-and-wellness confectionery market, with cleansing and whitening formulas leading the way.

Meanwhile, the U.S. candy market has witnessed a health-and-wellness surge of a different kind, namely the growing consumer demand for low-sugar and no-sugar products. Consumers want a healthy, or at least healthier, candy that still tastes sweet. This often means using a nonnutritive sweetener, such as aspartame, to obtain the required sweetness intensity after removing the sugar. "The drive for reduced-calorie confections has added a new twist when flavoring these applications. Depending upon the end application, reducing the sugar and adding sweeteners may not only change the flavor profile, but it may add unwanted off notes that require masking. Flavor systems are being required to do more than just flavor products; we are developing more and more flavors to mask unwanted off notes and decrease the lingering of sweeteners," says Huber.

This aftertaste alters the perception of the product, distinguishing it from its sugar-based counterpart; however, flavor companies have invested a great deal of research in counteracting this effect, so the consumer comes back for more. And they are Information Resources, Inc., Chicago, reports a 7% rise in sales of sugar-free gum and 10% for sugar-free non-chocolate candy from April 2005 to April 2006.

And that's a sweet result.

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