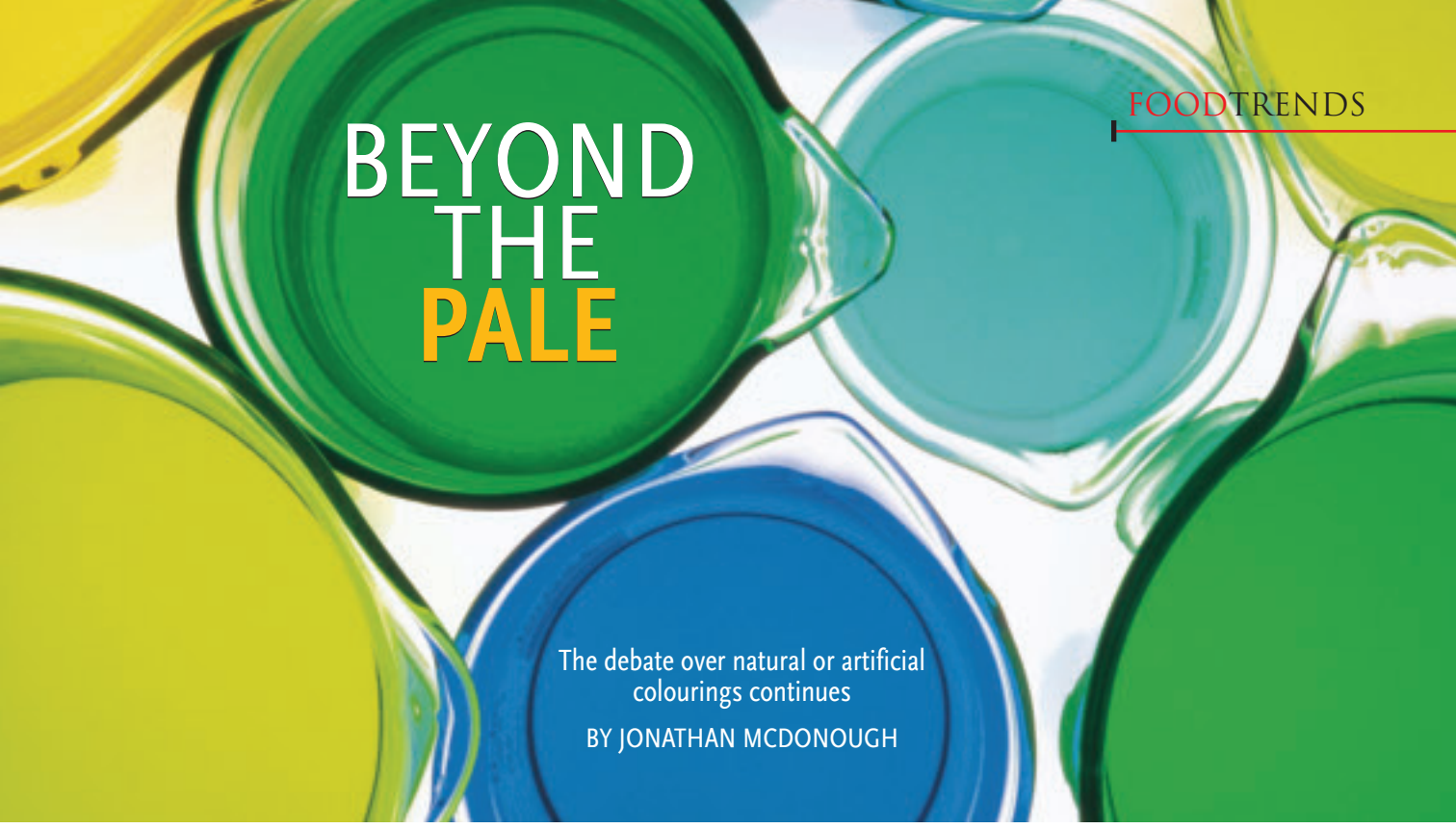

BEYOND THE PALE

The debate over natural or artificial colourings continues

BY JONATHAN MCDONOUGH

Walk into any modern supermarket and you'll soon be hit with colour. Vibrant primary hues adorn the outside of packaging and sing the praises of the food inside. Food manufacturers go to a lot of effort and expense to ensure the actual food we buy looks as bright and colourful as the packaging it comes in. While the modern shopping experience would appear very different without carefully designed natural and artificial colours, many factors, including cost, adaptability to formulas, stability, safety and finally public perception, all play a big role in what is used and how.

Much of the raw pigment and ingredients for food colours are sourced in South America and India. Some are ancient and well known, like the saffron crocus flower and turmeric root. Annatto or achiote seed, also used in cosmetics, comes from a plant called "the Lipstick Tree." Common in Latin American cooking, it is one of the most widely used of all natural colours, most recognizably tinting orange-coloured Cheddar cheese. Other natural food colourings include: blue dye from cabbage; carmine, a red dye derived from cochineal insects; caramel; and beta-carotene from carrots.

Compared to synthetics, natural colours are far more expensive, less concentrated, and offer a more limited palette hue. When engineering colours the choice of using natural or synthetic ingredients involves many decisions, such as shelf life and stability – which, after food cost, is the biggest challenge – acidity, packaging, light exposure and temperature. For instance, no natural green material can stand up to prolonged light exposure because nature's chlorophyll base quickly decays, turning an unsightly brown. Acids and alkalis change the final colour, and so do oxidizing and reducing agents, strong acids, and even the presence of micro-organisms in water-soluble food colours.

As a result of these issues, most of the thousands of tons of food colours used each year are artificial pigments. In everything from confectionery to pet food, hardly anything is presented to consumers without the impact, and cost, of colour being calculated into it. Ready to help food producers in navigating the difficulties of colour technology are companies such as Sensient Colors Inc. With an extensive customer service lab in Kingston, Ont., manufacturers are invited to work on colour R&D at the beginning of the product development process. "It takes a lot more technical work than just pouring in colour at the last minute," says National Sales manager Sam Houserman. "It's customer service that has made us the market leader." Sensient's Canadian plants do mostly value-added work, processing and packaging the powders, liquids, granules and lake pigments into ready-to-use form. But, says Sue Ferris, Technical director at Sensient's Kingston lab, there is more involved than processors originally assume. "Besides working on the formula, there are government regulations on what colours are permitted and how much, and export documentation, requiring a certificate of analysis with batch lot numbers."

While artificial compounds still dominate the market, consumers' growing concern with food allergies, safety and "all-natural" ingredients has led to more research on naturally sourced colourings. For example, Italian wine growers are now producing Malvidin, a grape skin extract. Present in large amounts in vegetables and fruits, such as blueberries, red cabbage and purple plums, these anthocyanins are extremely powerful antioxidants that suppress free radical formation and inhibit cell degeneration. Other anthocyanin colours come from Turkish farmers growing the re-discovered purple-black carrot, a source of antioxidants with anti-cancer properties.

Other savvy companies are reacting to consumers' demand for more "natural" ingredients by clever marketing of functional foods. Vancouver's Leading Brands, makers of True-Blue juices, for example, cashes in on the positive look of bright and healthy natural juices to appeal to consumers. In the case of blueberry, if it has enough blueberry juice in it to make it look blue, then it has enough antioxidants to be effective for your health too. David Neely, R&D director at Leading Brands, says the challenge is to use natural colourings that meet the stability issues needed in order to get it to market. Although a far more expensive process, Neely says, "When a new product comes aboard, it's a team approach to find the right formula. Natural food colours are more difficult to use, but if you've done your homework, the colour will remain stable in the product."

According to Tina Kostantelou, a food technologist in R&D at Dawn Food Products' Etobicoke, Ont. operation, price is still prohibitive when it comes to natural colouring. Dawn Foods, one of the world's largest manufacturers of bakery mixes and bases, has a best-selling product called Bakery Magic Brand Yolkoline Liquid Food Colour. For most Bakers, recipes and food cost guidelines simply couldn't accommodate using enough real egg to effectively colour their products. Able to last up to a year at room temperature, Yolkoline, along with other products such as Brilliant Red Food Colour, provides the visual impact of egg with no flavour alteration.

While the issue of food colour safety is taken seriously in North America, and intensely regulated on both sides of the border, food producers must still contend with the public perception of both natural and synthetic colouring ingredients. An example is the traditional source for red crimson colour, carmine, first used to colour wool and derived from the cochineal insect. Harvested from cactus in Peru and other countries, this is an example of the dilemmas and contradictions inherent in food labelling. Cochineal has so many qualities that it's no surprise it is so widely used – it's water soluble but doesn't fade, and it's light and heat stable, more so than most synthetic chemicals. Used in meat, sausage and poultry products, it's the red dye that colours surimi (crab-coloured Pollock) and is used in baked goods, candies and beverages. It's also the bright red colourant in the Italian aperitif Campari. So on the one hand it is a natural ingredient, but on the other hand, because it comes from an insect, it isn't aesthetically pleasing as a food substance, and might even offend some strict vegan, halaal and kosher diets.

But while consumers trouble themselves over terms like natural and organic, food colours may be unfairly targeted as a danger. "Not one scientific study has ever confirmed a danger with modern food colours," says Houserman. "Food colours are the most regulated of all food products by far, and any relationship to allergies are totally anecdotal." FC