

Dairy Flavor Formulation Challenges

Low-fat, probiotic and functional applications, and other technical obstacles

Pam Gribou, Givaudan Flavors

Pam Gribou is the director of cheese and dairy flavors development for Givaudan Flavors. Innovation in the category is boosting product development and adding to the technical challenges faced by flavorists at the bench. Dairy products increasingly contain probiotics and other functional ingredients—materials that contribute off notes and thus require creative flavor problem solving. Gribou notes that these hurdles are only going to grow over time as products incorporate a greater variety of beneficial ingredients for gut health, bone density improvement, healthy skin, joint health, physical performance, weight and cholesterol control, immunity and mental activity. Here she shares her insights into the most common issues facing flavorists in the dairy category.

The volatility of dairy commodities is an issue for food manufacturers because their costs are continuously changing, becoming more expensive from increased global demands and various other factors. Often these dairy commodities are a relatively large portion of the formulation. The utilization of concentrated flavors is a great solution to achieve cost optimization and still maintain authentic dairy profiles. Concentrated dairy flavors also allow utilization of lower or off-grade dairy commodities in the formulation of the dairy products by standardizing the desired profile.

Low-fat products: Both government and media are driving rising consumer awareness to food nutrition and potential health implications, and as a result, low-fat products continue to be an important category in the market. Making low-fat or non-fat products taste good is a big challenge. Fat is very important in the flavor release; therefore, it has an impact in the aroma and taste of the product. Reducing fat also has an impact in the texture of the product. Flavors can help improve the fat perception of a product, but in many cases a formulator also needs food additives such as gums and starches to make a reduced-fat product taste similar to a full-fat one.

When fat is removed, flavors need to provide not only impact, but functional attributes such as mouthfeel. It is essential to understand the base and develop flavor solutions that provide both flavor impact and mouthfeel.

Products with additives: Additives can have taste effects such as chalkiness and astringency, or off notes such as fishy, metallic and bitter. In flavoring products that

contain additives, one typically needs to mask the off note and then balance the flavor profile. Solutions for masking the undesirable characteristics often mute or modify the desired profiles and a rebalancing is necessary.

Functional products: Dairy flavors can provide increased mouthfeel perception in low-fat dairy products and support masking of off notes from additives or fortifications. Dairy flavors can increase consumer acceptability of many of the functional/nutritional products by improving overall flavor profiles and delivering authentic dairy tastes. The area of functional products continues to grow; the issues associated with these products are similar to food additives in that the ingredients added for the desired health effect often impart undesirable flavor characteristics. Building in acceptable flavor systems requires masking off notes. The most common functional products are plant sterols, antioxidants and omega-3 fatty acids.

Common technical issues: With health and wellness taking center stage in future food development, beneficial ingredients are added to food. In several cases, the beneficial ingredients cause off tastes (fishy: omega-3; chalky: calcium; sourness: berries; bitterness/astringency: sugar alternates, sterols, etc). Thus, an understanding of the base and ingredient functionality is critical in developing flavors that deliver good taste in new applications—the flavor has to perform a double function.

Developing flavors that are stable in new dairy products, whether they are low-fat and/or fermented, is also challenging. Flavor stability is dependent on understanding what is happening to the flavor in the specific matrix and how to approach creating a flavor to compensate or work in synergy with the matrix. Are components of the flavor being bound in the dairy product, or are portions of the flavor actually being modified by the matrix of the dairy product over time? Understanding the dynamics of the dairy system is critical in developing appropriate flavors.

Natural/organic: The demand for natural flavors continues to grow as customers look to provide a more healthy perception of their products to their customers. Organic is a demand mainly from developed markets and is small in comparison to natural flavor requests. Requests for “Whole Foods Compliant” flavors continues to increase (www.wholefoodsmarket.com/products/unacceptable-ingredients.php).

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