Using design thinking to increase sugar reduction options in consumer products

Part 1, Sugar reduction: Applying design thinking framework

INTRODUCTION

Sugar, Azucar, Sucre, Zucchero, Zucker. In any language and culture, sugar is an important ingredient in many foods, creating the flavours and textures that consumers demand. However, sugar in excessive amounts is also a health concern (1). This dichotomy leaves food companies with a dilemma of creating products that consumers enjoy and want to purchase while respecting the goal of improved health. With so many different products and so many ingredient options that provide sweetness, how can product developers deliver innovation to meet consumer wants, health objectives and business needs? Design thinking may be the answer to reducing sugar in products – maybe too many – which makes it hard to know where to start. Design thinking helps give product developers an edge by enabling them to look at their products differently, with more empathy for the consumer and a better understanding of sugar’s role. With the design thinking approach product developers can pursue a better and more focused formulation path, delighting the consumer with the products they desire.

AN OVERVIEW OF SUGAR

Sugar, the simplest of all carbohydrates, is a member of the saccharide family. Although more complex carbohydrates such as polysaccharides or oligosaccharides also have a characteristic sweet taste, sugar generally refers to monosaccharides or disaccharides including glucose, fructose, galactose, lactose and sucrose and maltose (2). Monosaccharides consist of a single sugar molecule while disaccharides are composed of two monosaccharides linked together (3).

In foods, sugars can be naturally occurring (such as in daily products, fruits, and vegetables) or added (such as in desserts, sweetened beverages, cereals, and candies). Added sugars include include monosaccharides, disaccharides, or artificial sweeteners. Artificial sweeteners are either natural products, naturally derived, or synthetic. Many artificial sweeteners are non-nutritive or high intensity that impart sweetness with little to no caloric value (4,5,6).

KEYWORDS: Sugar reduction, design thinking, sweeteners.

Examples of Sugar Reduction Approaches

With sugar playing a varied role in so many food systems, reducing sugar levels can be challenging. Newer technologies to address the complicated path of sugar reduction include ingredients that either replace the sweetness and functionality of sugar, or block the bitterness often associated with artificial sweeteners.

The UK flavour house Synergy has a dairy-based natural sweetness that can help reduce 30% of the sugar in coconuts or biscuits (12). The flavour helps create the sweetness while the dairy-based ingredients mimic the mouthfeel and texture of sugar. MycoTechnology of Aurora, Colorado, USA produces a bitter blocker made from fermented mushrooms that purportedly blocks all 25 different kinds of bitter receptors, leading to a 50-70% reduction in added sugar [13].

Sugar reduction in gelato has long been considered extremely challenging as sugar is needed for flavour, and is also critical to gelato’s velvety texture and mouthfeel. Part of achieving this texture is creating the right ratio of solids to water, typically 32 to 40% (7). Recently, Carpigiano unveiled a machine that produces gelato with either no added sugar or low-sugar using an Italian artificial sweetener called Diete, Tic. The machine uses computer algorithms and temperature-controlled gas to control the solids to water ratios (14).

Understanding sugar’s role creates a faster, more focussed path for its reduction or replacement. For example, if sugar’s primary role is related to desirability and the overall product flavour, but not to the product’s stability or food safety, then a reduction strategy should focus on delivering a similar taste and flavour profile. A combination of reducing sugar levels and adding substitutes should provide sweetness with limited changes to the product’s overall flavour impact. The flavour impact may be related to overall sweetness as well as the time-intensity of sweetness and other basic tastes.

DESIRABILITY-FEASIBILITY-VIABILITY (DFV) FRAMEWORK

The role and type of sugar impacts food products, and approaches to formulating or re-formulating products to reduce sugar vary greatly. One such approach to product development is design thinking (15). The design firm IDEO is often credited with popularising design thinking and the Desirability-Feasibility-Viability framework (DFV) which is applicable to food product development. Design thinking, a developer can focus on understanding where desirability, feasibility, and viability intersect. While most product development considers consumer preferences, production capability, sales channels and costs, the DFV framework looks at these factors a bit differently.

SWEETENERS
SUMMARY

Consumers enjoy what sugar brings to foods but are concerned with excess sugar consumption. Food companies need new approaches to meet these conflicting consumer desires, such as the design thinking approach presented here. Considering the role of sugar in each product formulation and how it impacts desirability, feasibility and viability, can shorten product development timelines and improve outcomes. The upcoming article, Part 2, will illustrate how the DFV framework can guide successful sugar reduction strategies through a wide range of product examples.

REFERENCES

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ABOUT THE AUTHORS

Suzan Mayer, MS, CFS
Innovation Advisor
Certified Food Scientist with over 25 years of food industry experience in product development, sensory evaluation, and quality systems, and 10 years in innovation and commercialization. Managed project and programs for all phases of the product lifecycle for a wide variety of foods. Adjunct professor at Rowan University Center for Innovation and Entrepreneurship.

Jamie Pero Parker, PhD
Innovation Advisor
Chemist with over 12 years of innovation research experience in technology scouting, forecasting, and commercialization with an emphasis in sustainability, biological, bioanalytical, and biophysical chemistry. Published several articles looking at sustainability in new product development and innovation practices. A highly-regarded trainer in innovation research techniques with extensive international and national experience.