Science and Strategy in Sugar Reduction

-Mamta Budhiraja, Associate Director, Regulatory Affairs, PepsiCo India Holdings Pvt Ltd

She started by discussing the scientific, technological, and regulatory aspects of reducing sugar in food products and further explained sugars mainly, mono- and disaccharides and how they play critical roles beyond sweetness, such as improving texture, mouthfeel, browning, flavor development, preservation, protein stabilization, and microbiological stability in foods like bakery products, beverages, ice creams, custards, cakes, and condensed milk. Because sugar contributes significantly to product quality and processing characteristics, replacing it is technically challenging.

She highlighted various sugar-reduction strategies including portion control, sugar-free products, reduced-sugar claims, no-added-sugar formulations, and the use of alternative sweeteners and bulking agents. She also explained the importance of understanding sucrose inversion, Brix measurement, and factors such as temperature, pH, and storage conditions during product formulation.

Ms Mamta explained different categories of sugar replacers and sweeteners. These include low- or no-calorie sweeteners such as aspartame, sucralose, acesulfame potassium,etc; polyols like sorbitol and erythritol; soluble fibers such as inulin and polydextrose; and carbohydrate-based bulking ingredients like maltodextrins. Each ingredient differs in sweetness potency, caloric contribution, GI tolerance, functionality, and regulatory status.

She emphasized that sugar remains the “gold standard” for sweetness, so manufacturers must carefully balance taste quality, stability, solubility, synergy between sweeteners, metabolism, cost-in-use, and regulatory acceptance when reformulating products.

Lastly she also addressed the safety and metabolism of approved sweeteners and explained that international bodies such as JECFA, Codex Alimentarius, FDA, EFSA, and other global health organizations have extensively evaluated these ingredients. She concluded her talk, by highlighting successful sugar reduction requires regulatory compliance, optimized taste, processing compatibility, ingredient stability, cost effectiveness, and innovation in formulation strategies while ensuring consumer safety and product quality.