

TECHNICAL TAGATOSE

Food Production Applications
Scientific Bibliography

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SWEETNESS & TASTE PROFILE



Sweetness

- 92% as sweet as sucrose¹
- Sweetness potency consistent across all concentrations and food systems^{1,3}
- Sweetness intensity increases with concentration¹



Taste & Flavor

- Clean, neutral, sweet taste²
- Sweet, fruity, caramel-like flavor profile from Maillard reactions^{4,5,6}
- Lacks lingering aftertaste unlike polyols, stevia, and monkfruit⁷
- More sweetness, sweet aftertaste, less bitterness than erythritol¹



Blending & Synergy

- Blends well with high-intensity sweeteners, polysaccharides, and flavor-modifying components^{3,5-11}



Consumer Perception

- Despite low consumer awareness, informed consumers have a favorable opinion²⁶
- Easier to bulk pack than polyols and high-intensity sweeteners⁷

PHYSICAL & CHEMICAL PROPERTIES



Solubility & Moisture

- Slightly less soluble than sucrose²
- Hygroscopicity similar to sucrose, less than fructose (<85% RH)^{2,5,7}
- Similar water-holding capacity as sucrose¹³
- Reduces water activity more than sucrose^{2,12}



Browning & Maillard Reactions

- More reactive in Maillard browning than sucrose and fructose^{7,12,18,19,23,24}
- Produces less acrylamide than glucose in a model system of asparagine and heat²⁷



Thermal Properties

- Lower melting point than sucrose²
- Lower glass transition temperature than sucrose^{5,7,25}
- Depresses freezing point to increase stability of frozen products^{5,7}



Stability

- Solid: pH stable; Liquid: most stable in unheated, acidic, citrate-buffered environment^{2,7,14}
- Stable in pasteurized beverages such as milk and diet lemonade^{7,28,29}

ANTI-MICROBIAL & OTHER FUNCTIONAL PROPERTIES



Anti-Microbial

- Inhibits bacterial growth in media and cooked cured ham¹⁵
- Reduces growth of intestinal pathogens in yogurt fermentation¹⁶
- Functions as an anti-biofilm agent¹⁷



Viscosity, Stickiness, Crystallization

- Modulates viscosity in multiple food systems^{2,5,9,16}
- Reduces stickiness^{5,6,9}
- Readily crystallizes — ideal for frostings^{5,7}

Key Advantage: 1:1 Sugar Replacement

Tagatose replaces sucrose at the same weight and volume — no reformulation of bulking agents needed. Combined with its anti-microbial properties, clean taste, and browning capability, it is uniquely suited as a functional sweetener for food manufacturing.

BEVERAGES & DAIRY APPLICATIONS



Non-Chocolate Milk & Soft Drinks

- Milk: tagatose-sucralose or tagatose-stevia mixtures are as sweet as sucrose³
- Milk: tagatose-stevia is sweeter than erythritol-stevia³
- Soft drinks: 0.2-1% tagatose in soft drinks sweetened with high-intensity/potency sweeteners masks bitterness and improves mouthfeel^{7,30}



Chocolate Milk

- Improves mouthfeel, sweetness, toffee flavor, sweet aftertaste; reduces bitterness of acesulfame K⁵
- Improves mouthfeel and consumer acceptance while maintaining hardness, sweetness, odor and flavor of sucrose³²



Yogurt & Lassi

- Yogurt: stable, retains probiotics, accepted by consumers^{13,16,36,37}
- Yogurt: similar appearance, sweetness, color, sourness, aftertaste, thickness, acidity, smoothness, water-holding capacity, viscosity as sucrose⁷
- Lassi: similar viscosity, acidity, shelf-life and consumer acceptability as sucrose³⁵



Desserts & Meal Replacements

- Ice cream: reduces crystal formation and effectively replaces sucrose 1:1⁷
- Dulce de leche: reduces HMF formation³¹
- Meal replacements: increases probiotics⁹

CHOCOLATE & CONFECTIONS



Dark Chocolate

- Similar taste, texture, and positive emotions elicited as sucrose ^{38,39}
- Similar hardness, moisture, water activity, flavor, mouthfeel, and sweetness as sucrose ³⁹
- Similar effects on viscosity and melting as sucrose ^{39,40,7}
- Combined with inulin/polydextrose: similar hardness and melting, increased viscosity compared to sucrose ^{39,41}



Milk Chocolate

- Fuller, creamier mouthfeel than fructose ⁵
- Softens and improves texture ^{7,40}
- Similar effects on viscosity and melting as sucrose ^{39,40,7}
- Creates caramelized/malt/toffee flavors useful in milk-based crumb chocolates ⁷



Hard Candy & Gum

- Hard candy: functions as a plasticizer ⁴⁵
- Hard candy, wine gum: good flavor profile and stability, combines well with other sweeteners ⁴⁶
- Hard candy, chewing gum: anti-microbial ¹⁷
- Chewing gum: agreeable taste, suitable for kernals and dragee ^{17,46}



Other Confections

- Ganache: similar hardness, sweetness, mouthfeel as sucrose ⁴⁵
- Hazelnut spread: similar mouthfeel, moisture, sweetness as sucrose ⁴⁵
- Fondants, caramel, pralines, fudge: well-suited due to crystallization ⁴⁶

BAKED GOODS & SPECIALTY APPLICATIONS



Cookies

- Appearance preferred over sucrose cookies⁶
- Consumer preference for tagatose-sucrose mixture is no different than sucrose only⁶
- Cookie dough: similar rheology as sucrose with reduced baking time⁶
- Similar adhesiveness, cohesiveness, resilience, springiness as sucrose⁷
- Lower spread ratio than sucrose^{6,43,7}



Muffins, Cupcakes & Pastry

- Cupcakes, muffins: consumer preference for tagatose-sucrose mixture is no different than sucrose only⁶²
- Gluten-free muffins: suitable replacement for sucrose¹²
- Cupcakes: induces similar satiety as sucrose²¹



Starch & Citrus-Fruit Jelly

- Wheat starch gel: inhibits retrogradation⁴⁴
- Citrus-fruit jelly: similar moisture, pH, stability as sucrose; increased antioxidant capacity³³
- Citrus-fruit jelly: consumers more likely to purchase tagatose-isomaltose mixture than sucrose³³



Egg Products & Oral Care

- Egg yolk drop dessert: tagatose-FOS mixture maintains hardness and cohesiveness of sucrose³⁴
- Meringue: increases antioxidant capacity²⁰
- Toothpaste: stable, improves taste and mouthfeel⁴⁷

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