



SWEETNESS ARCHITECTURE
Protein. Fiber. Adaptogens. Built on Precision Sweetness.

BETTER SYSTEMS, BETTER COFFEE

Icon sweeteners, fibers, and modulators working together.

RTD coffee has moved beyond convenience and into its second act. Today's consumers expect more than caffeine in a bottle. They want protein for satiety, fiber for balance, adaptogens for focus, and low sugar without sacrificing taste. For formulators, that means working inside one of the most demanding beverage matrices in the industry.

Coffee is acidic, polyphenol-rich, and unforgiving under thermal processing. Add protein and stability becomes a challenge. Denaturation, aggregation, and sedimentation are real risks, especially under UHT conditions. Add fiber and texture flaws are exposed. Add adaptogens and bitterness intensifies. Remove sugar and the system is laid bare. Body drops. Sweetness carry shortens. Bitterness lingers.

Most functional RTD coffee failures are not caused by the functional ingredients themselves. They result from weak sweetness architecture.

Successful systems begin with layered high-intensity sweeteners such as Monk Fruit MV50, Reb M, and RM95D, each selected for its temporal behavior and compatibility with coffee's natural bitterness. Sweetness modulators further refine perception by suppressing bitterness, extending sweetness decay, and reducing the need for higher sweetener loads. Soluble fibers restore lost solids, support mouthfeel, and improve sweetness carry when sugar is reduced or removed.

These components must work together, not independently. And they must be validated post-process, not just on the bench. UHT and HPP can expose instability, amplify bitterness, and magnify imbalances that appear minor during early trials.

RTD coffee success today requires systems thinking. It demands precision integration of sweeteners, modulators, and fibers that protect coffee's core flavor while enabling protein-forward, adaptogen-aware, low-sugar formulations.

The brands that win in this next growth phase will not rely on brute force sweetness or ingredient stacking. They will build drinks that maintain balance, stability, and drinkability from first sip through shelf life.

Coffee first. Function supported. Sweetness engineered.



Icon Foods, Inc.
19250 NE Portal Way
Portland, OR 97230
310-455-9876
iconfoods.com

FAST FACTS

Coffee's natural pH (≈ 4.8–5.2) creates stability challenges for protein systems, especially under UHT processing.

Reducing sugar doesn't just remove sweetness. It removes body, viscosity, and bitterness masking, exposing formulation weaknesses.

Layered high-intensity sweeteners outperform single-source systems in RTD coffee due to temporal balance and bitterness control.

Sweetness modulators can reduce total HIS load while extending sweetness perception and improving post-process flavor clarity.

Low-viscosity soluble fibers do more than support a claim. They restore solids, improve sweetness carry, and stabilize mouthfeel in reduced-sugar systems.



Read our
blog article!

iconfoods.com/category/products-blog/

FAQ

1. Why does protein instability increase in RTD coffee compared to neutral pH beverages?

Answer: RTD coffee systems typically operate at a pH of 4.8–5.2 and contain high levels of polyphenols. Acidic conditions increase the risk of protein denaturation and aggregation, particularly under UHT. Polyphenols can bind to exposed hydrophobic regions on proteins, accelerating precipitation and sediment formation. Heat treatment further unfolds protein structures, compounding instability. Successful systems must account for protein source selection, mineral balance, and post-process evaluation rather than relying solely on bench-top dispersion performance.

2. Why does sugar reduction amplify bitterness in coffee-based beverages?

Answer: Sucrose provides more than sweetness. It contributes to the solids, viscosity, and temporal masking of bitter compounds, such as chlorogenic acids. When removed, the perception of bitterness intensifies because the decay curve of sweetness shortens and mouthfeel becomes thinner. Effective reduced-sugar systems must rebuild structure and extend sweetness perception through layered HIS systems, modulators, and fiber-supported restoration of mouthfeel.

3. How do sweetness modulators differ mechanistically from high-intensity sweeteners?

Answer: High-intensity sweeteners activate sweet taste receptors (T1R2/T1R3), generating sweetness perception. Sweetness modulators do not directly add sweetness; instead, they influence receptor signaling or downstream perception, thereby suppressing bitterness and extending the duration of sweetness perception. In coffee systems, modulators help reduce HIS inclusion rates while maintaining temporal balance and improving post-UHT flavor clarity.

4. What role does soluble fiber play beyond nutritional positioning in RTD coffee?

Answer: Low-viscosity soluble fibers restore lost solids when sucrose is removed, improving bulk density and sweetness carry. They contribute to perceived body, smooth acid sharpness, and reduce the sensory sharpness associated with high-intensity sweeteners. In well-designed systems, fiber functions as a structural component, not merely a label claim.

5. Why must sweetness systems be validated post-process rather than pre-process?

Answer: Thermal treatments such as UHT and pressure-based systems like HPP can alter protein structure, accelerate Maillard reactions, and modify flavor perception. Sweetener interactions and bitterness intensity often shift after processing and during shelf life. Bench-top sensory performance does not reliably predict commercial stability. A robust formulation requires evaluation following full process simulation and extended storage testing.

Pro Tip

Build sweetness around bitterness, not on top of it.

In RTD coffee, address bitter compounds and polyphenol interaction first. Then layer sweetness strategically. If bitterness isn't managed upstream, no high-intensity sweetener load will fix it downstream.



©2026 Icon Foods Inc. – All Rights Reserved

