Overconsumption of added sugar has been linked to increased weight, risk of type 2 diabetes, and numerous other adverse health outcomes. This has ultimately led to recommendations to lower intake. One approach for reducing added sugar is use of low-calorie/non-nutritive sweeteners.

While low-calorie sweeteners are FDA approved and numerous toxicology and clinical studies demonstrate that low-calorie sweeteners are generally safe and well-tolerated, there are still many more questions that need to be answered surrounding their metabolic and health effects.

### What Research Currently Tells Us About Low-Calorie Sweetener Use and Nutrition:

- Low-calorie sweetener consumption is consistently linked to weight gain, risk of type 2 diabetes, and other cardiometabolic diseases in observational studies. However, these studies cannot prove cause and effect.

- Low-calorie sweeteners exert metabolic effects \textit{in vitro} and in rodent models, yet relevance to humans is unclear.

- Some short-term human evidence suggests that replacing sugar sweetened beverages with low-calorie sweetener beverages could help in weight management.

- Longer-term and higher quality evidence is needed on effects of prolonged low-calorie sweetener consumption on cardiometabolic disease, particularly among children.

### Key Future Research Needs on Low-Calorie Sweetener Use and Nutrition

- Improving assessment of low-calorie sweetener intake during research

- Consideration of contextual factors in the human participants such as life stage, habitual consumption, motivation for use, etc.

- Examine effects based on:
  - Low-calorie sweetener type
  - Food/beverage source of low-calorie sweeteners
  - Different intake levels
  - Across different populations

- Investigating metabolic and health effects of natural low-calorie sweeteners in humans, such stevia and monk fruit extract

- Cardiometabolic implications of inter-generational/early life low-calorie sweetener exposure is largely unknown
Sweeteners and Health: The State of the Science
Summary Handout

Resources: