

How Low-Calorie Sweeteners Interact with the Gut Microbiota

What are low-calorie sweeteners?

Low-calorie sweeteners (LCS) are ingredients often added to foods and beverages in place of sugars, providing a similarly sweet taste but with less (or zero) calories. Sugars are several hundred times less sweet than LCS, so less LCS are required to achieve a level of sweetness similar to sugars. This may be useful for people who enjoy the taste of sweetness, but who want to limit their intake of sugars and calories.¹

LCS can be classified as zero calorie or low-calorie sugar alternatives.²⁻⁴

Check out some examples below.

Zero-calorie Sweeteners	Low-calorie Sweeteners
Acesulfame K	Aspartame
Sucralose	Erythritol
Stevia	Thaumatococcus
Monk Fruit	
Saccharin	

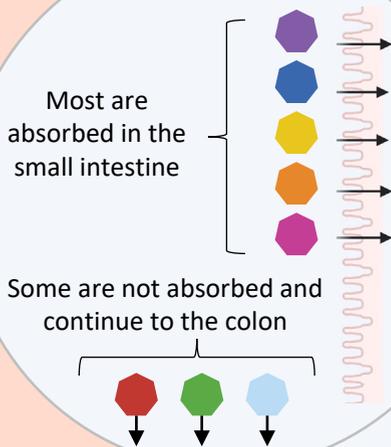
What are the gut microbiota?

The gut microbiota play a key role in human health and disease. The gut microbiota consist of the microorganisms that live within our digestive tracts. The presence and variety of microorganisms that live in our gut are unique to each person and can be influenced by what we eat and drink.⁵

How do LCS interact with our gut?⁶⁻¹⁵

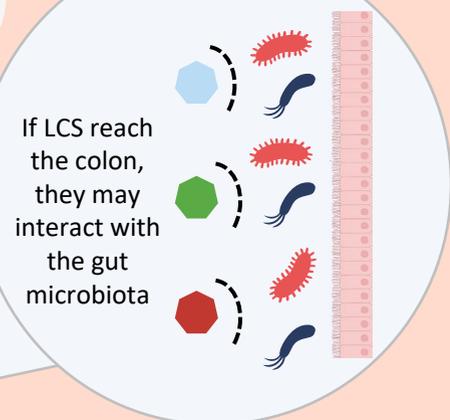
After consuming LCS, they enter the digestive tract.

Small Intestine



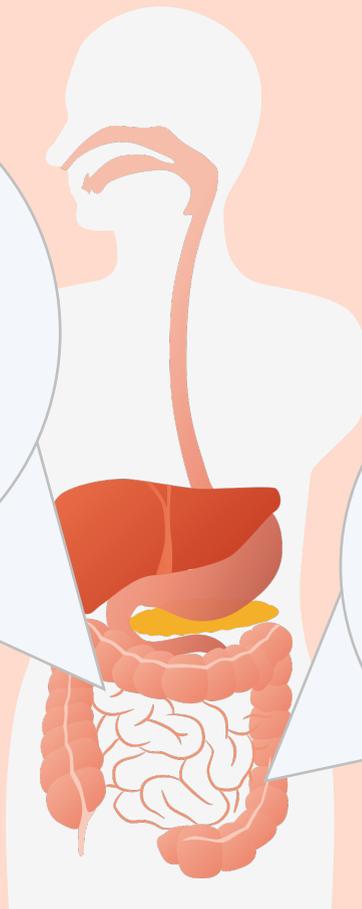
If LCS are not absorbed in the small intestine, they will move further down the digestive tract.

Colon



Key:

-  Sucralose
-  Stevia
-  Monk Fruit
-  Erythritol
-  Thaumatin
-  Saccharin
-  Aspartame
-  Acesulfame K
-  } Microbes



How might LCS effect my gut microbiota?

**Aspartame,
Saccharin,
Acesulfame K,
Erythritol, &
Thaumatin**

These LCS are absorbed in the small intestine, before reaching the colon (where the gut microbiota live).^{8-10, 14, 15}

Because these LCS are absorbed before interacting with the gut microbiota, it is unlikely that they influence the gut microbiota significantly.^{8-10, 14, 15}

The evidence that LCS adversely affect the gut microbiota is inconclusive at this time.¹⁶⁻¹⁸

These LCS are not absorbed in the small intestine, so they may come into contact with the gut microbiota.^{6, 7, 11-13}

Most studies investigating the effects of these LCS have been conducted in animals, not humans.¹⁹

Although they may interact with the gut microbiota, a definitive link between LCS and adverse effects on the gut microbiota has not been established.^{20 - 22}

**Sucralose, Stevia,
&
Monk Fruit**

More human clinical research is needed to understand the relationship between LCS and the gut microbiota, since most studies have limitations, are not conducted in humans, investigate LCS in an amount that is higher than typical human consumption, and cannot be generalized to the entire population.^{16,23}

For more information on LCS, visit these helpful resources:

[PepsiCo Health & Nutrition Sciences | Low-Calorie Sweeteners: A Safe Alternative](#)
[PepsiCo Health & Nutrition Sciences | Health Benefits of Low-Calorie Sweeteners](#)

References

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