

Severe SARS-CoV-2 infection: does the artificial sweetener sucralose play a role?

Susan S Schiffman ,¹ H Troy Nagle ^{1,2}

We read with interest the article by Hazan and colleagues “Lost microbes of COVID-19: *Bifidobacterium*, *Faecalibacterium* depletion and decreased microbiome diversity associated with SARS-CoV-2 infection severity”¹ in which they reported a significant decrement in gut bifidobacteria in persons with severe Covid. This caught our attention because the common artificial sweetener sucralose (eg, Splenda) has a profound effect on the microbiome including significant reductions in bifidobacteria in the gut. Abou-Donia *et al*² administered sucralose to rats (delivered in Splenda) for 12 weeks at dosages approved for human use in the United States and/or Europe (1.1–11 mg/kg/day). Bacterial analysis of faecal samples for bifidobacteria, lactobacilli, *Bacteroides*, clostridia, total anaerobes, total aerobes, and enterobacteria showed an orderly and progressive pattern of reduction in bacterial counts relative to controls over the 12 week sucralose treatment period. Figure 1 shows the reduction in bifidobacteria over the 12 week period.

The reductions in bifidobacteria, lactobacilli, *Bacteroides*, and total anaerobes after 12 weeks were statistically significant at the lowest dosage of 1.1 mg/kg/day (approximately one 12-ounce

drink sweetened with sucralose for a 120-pound person). Furthermore, the reduction in beneficial bacteria such as bifidobacteria was far greater than for pathogenic bacteria such as enterobacteria. This dysbiosis with relative differences among different bacterial types was accompanied by histopathological changes in the intestinal epithelium. Additional studies from other laboratories have also consistently found that sucralose alters bacterial counts and diversity.³

Hazan *et al* hypothesised “that low bacterial diversity and depletion of *Bifidobacterium* genera either before or after infection led to reduced proimmune function, thereby allowing SARS-CoV-2 infection to become symptomatic.”¹

This raises the question of whether the organochlorine sweetener sucralose, which is present in tens of thousands of food products, may contribute to the observed depletion in bifidobacteria and low bacterial diversity found in severe SARS-CoV-2. Additional research is needed: (1) to establish the underlying cause of the correlation between dysbiosis and severe SARS-CoV-2 reported by Hazan and colleagues, and (2) to determine if sucralose-containing products play a role in this dysbiosis and the course of SARS-CoV-2 infection and recovery.

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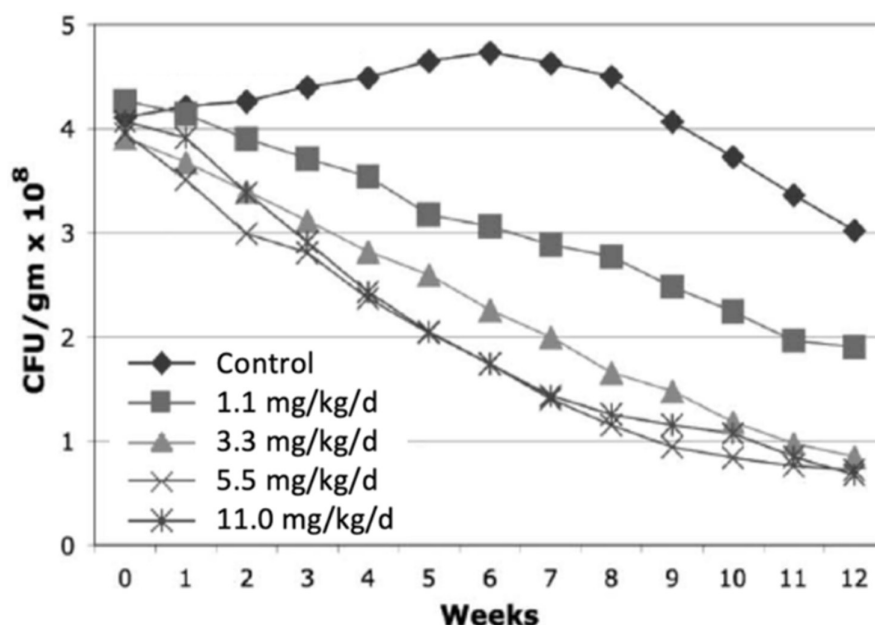


Figure 1 Effect of sucralose (mg/kg/d) delivered in Splenda on bifidobacteria.^{2,3} Viable counts are expressed as colony-forming units (CFU) per gram of wet weight faeces.

¹Biomedical Engineering, North Carolina State University at Raleigh, Raleigh, North Carolina, USA

²Electrical and Computer Engineering, North Carolina State University at Raleigh, Raleigh, North Carolina, USA

Correspondence to Dr Susan S Schiffman; schiffmansusan@gmail.com

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ORCID iDs

Susan S Schiffman <http://orcid.org/0000-0002-4704-7629>

H Troy Nagle

<http://orcid.org/0000-0003-2323-9818>

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