

Low-calorie sweeteners do not mean low risk for infants

January 30 2020, by Leanne Yohemas



A researcher conducts test on low-calorie sweeteners in the lab. Credit: Riley Brandt

Many people turn to artificial or so-called natural sweeteners to cut calories and lose weight. A new study led by Dr. Raylene Reimer, Ph.D.,

published in the high-impact journal *Gut* discovered that the consumption of low-calorie sweeteners while pregnant increased body fat in their offspring and disrupted their gut microbiota—the trillions of bacteria and other microorganisms that inhabit the intestinal tract and affect our health and risk of numerous diseases.

The findings are significant as they impact the critical early years of life, particularly during pregnancy and breast feeding.

"Low-calorie sweeteners are considered safe to consume during pregnancy and lactation, however evidence is emerging from [human studies](#) to suggest they may increase body weight and other cardiovascular risk factors," says Reimer, a University of Calgary professor in the Faculty of Kinesiology, and Department of Biochemistry & Molecular Biology at the Cumming School of Medicine, and member of the Alberta Children's Research Institute.

"Even stevia, which is hailed as a natural alternative to aspartame and other low calorie artificial sweeteners, showed a similar impact on increasing offspring obesity risk in early life."

Aspartame, an [artificial sweetener](#), and stevia, a natural low-calorie [sweetener](#) extracted from a plant native to South America, are 200-400 times sweeter than sugar. Stevia, gaining popularity, was historically used in Paraguay and Brazil to treat diabetes and is an emerging ingredient in many natural products and protein drinks.

Demand for sweeteners for weight loss

In response to higher obesity rates, the use of [low-calorie sweeteners](#) has risen, particularly in women and children. Daily consumption is associated with large babies and early menstruation in young females under 10 years—a known risk factor for chronic diseases. Additionally,

the presence of some but not all of these sweeteners has been detected in breastmilk presenting a potential mode of transmission, according to the study.

"Understanding the impact of dietary ingredients on maternal metabolism and gut microbiota may help to define the optimal maternal diet, one which promotes a healthier future for both mother and child," says Reimer.



(L to R) Drs. Erin Noye Tuplin and Raylene Reimer in the lab with Reimer's PhD student Fatima Chleilat . Credit: Riley Brandt

Altering the gut microbiota of babies

Our understanding of how sweeteners affect weight gain is not complete but there is reason to believe that alterations in the gut microbiota may play a key role. In this animal study, a [fecal transplant](#) was used to show the direct influence of altered gut microbiota on causing the increased obesity risk. Transplanting [fecal matter](#) from the offspring of mothers that consumed the low-calorie sweeteners into sterile, germ free mice caused the mice to gain more weight and have worse blood glucose control. Even though the offspring had never consumed the sweeteners themselves, the changes to mom's microbiota and metabolism was sufficient to change the microbiota in their offspring and trigger obesity.

"A healthy pregnancy, including good nutrition, is important for a healthy baby," says Reimer. "Our research will continue to examine what makes an optimal diet and more importantly seek to find ways to correct disruptions to [gut microbiota](#) should they occur."

More information: Jodi E Nettleton et al, Maternal low-dose aspartame and stevia consumption with an obesogenic diet alters metabolism, gut microbiota and mesolimbic reward system in rat dams and their offspring, *Gut* (2020). [DOI: 10.1136/gutjnl-2018-317505](https://doi.org/10.1136/gutjnl-2018-317505)

Provided by University of Calgary

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