

Research finds pre-pregnancy weight affects infant growth response to breast milk

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In the first study of its kind, LSU Health New Orleans researchers report that women's pre-pregnancy overweight or obesity produces changes in breast milk, which can affect infant growth. The research findings are published in *PLOS ONE*, available online here.

"The importance of this study is that it demonstrates that breast milk contents can vary depending on mother's [weight status](#) at the time of conception and further impact the growth and development of breastfeeding infants," says Henry Nuss, Ph.D., Assistant Research Professor of Behavioral & Community Health Sciences at LSU Health New Orleans School of Public Health and lead author.

"Childhood obesity rates in the US have increased significantly in recent decades," notes Melinda Sothorn, Ph.D., Professor of Behavioral & Community Health Sciences at LSU Health New Orleans School of Public Health. "Although many

studies have shown that breastfeeding may be protective against excessive weight gain during [early life](#), we do not fully understand why."

Breast milk contains pro-[inflammatory proteins](#) such as [tumor necrosis factor alpha](#) (TNF-?) and interleukin-six (IL-6), as well as hormones like insulin and leptin, and anti-inflammatory polyunsaturated fatty acids, such as omega-3 (DHA) and omega-6 (EPA). If and how their interaction may influence infant growth has been unknown.

The research team set out to discover the interrelationships between these compounds in blood and breast milk in early postpartum women with normal BMIs and with overweight/obesity before pregnancy to determine if these components correlated to infant growth measures at age 4-8 weeks.

They compared polyunsaturated fatty acids, inflammatory markers and hormones to infant weight, length, head circumference and percent fat mass at 4-8 weeks postpartum in the same group of 33 women. The researchers found that pro-inflammatory qualities of breast milk were associated with infant growth measures regardless of maternal pre-pregnancy BMI. However, infants born to women with overweight or obesity demonstrated less responsive growth to breast milk.

"Infants who are born to mothers of unhealthy weight status may be metabolically programmed to have a less favorable growth response to [breast milk](#)," Dr. Nuss adds. "These finding suggest that women of childbearing age who anticipate having a child should consider their weight status as a potential risk factor for adverse growth outcomes."

More information: Henry Nuss et al, Maternal pre-pregnancy weight status modifies the influence of PUFAs and inflammatory biomarkers in breastmilk on infant growth, *PLOS ONE* (2019). DOI: [10.1371/journal.pone.0217085](https://doi.org/10.1371/journal.pone.0217085)

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