

High-fat diet may change breast milk makeup, affect baby's health

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New research suggests that following a high-fat diet during lactation—regardless of diet during pregnancy—alters RNA activity in breast milk. The changes in genetic material may increase the risk of metabolic disorders such as type 2 diabetes in offspring. The article is published ahead of print in *Physiological Genomics*.

RNA is a molecule chain that uses genetic information from DNA—the "genetic blueprint"—to produce proteins in the cells. RNA defects can play a role in potentially serious health conditions such as cancer, [heart disease](#) and stroke.

Previous studies have shown that offspring born to [mothers](#) who consumed a high-fat diet during pregnancy and breastfeeding are more likely to become obese and develop chronic conditions such as diabetes, [high blood pressure](#) and heart disease. However, less is known about the effects of a high-fat diet during lactation alone.

Researchers from Purdue University in Indiana studied two groups of pregnant mice. One group was given a high-fat diet during gestation and the other was fed a typical diet. The research team divided the newborn mice pups into four groups:

- born to and fed by mothers that followed a high-fat diet;
- born to mothers that followed a high-fat diet and fed by mothers that followed a typical diet;
- born to typical-diet mothers and fed by high-fat-diet mothers;

and

- born to and fed by normal-diet mothers.

The researchers found that the milk made by mice following a high-fat diet had a higher fat content. In addition, the researchers observed changes in both messenger RNA (mRNA), which delivers coded information from DNA to protein-making cells, and miRNA—non-coded [genetic material](#) involved with metabolism, cell death and nervous system function. More than 1,500 mRNA genes and 25 miRNAs expressed differently in the milk of the mothers on a [high-fat diet](#) during lactation compared to the milk produced by mothers on a typical diet. These changes could potentially affect the development of the newborns and put them at higher risk for chronic disease as adults. "Further, miRNA and mRNA only make up a portion of RNAs secreted in the milk and future studies will be needed to describe other species of RNAs [in [breast milk](#)] and their potential roles," the researchers wrote.

More information: Yulu Chen et al. The Effect of High Fat Diet on Secreted Milk Transcriptome in Mid-lactation Mice, *Physiological Genomics* (2017). [DOI: 10.1152/physiolgenomics.00080.2017](https://doi.org/10.1152/physiolgenomics.00080.2017)

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