

# Sick from stress? Blame your mom... and epigenetics

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If you're sick from stress, a new research report appearing in the August 2012 issue of *The FASEB Journal* suggests that what your mother ate-or didn't eat-may be part of the cause. The report shows that choline intake that is higher than what is generally recommended during pregnancy may improve how a child responds to stress. These improvements are the result of epigenetic changes that ultimately lead to lower cortisol levels. Epigenetic changes affect how a gene functions, even if the gene itself is not changed. Lowering cortisol is important as high levels of cortisol are linked to a wide range of problems ranging from mental health to metabolic and cardiovascular disorders.

"We hope that our data will inform the development of choline intake recommendations for pregnant women that ensure optimal fetal development and reduce the risk of stress-related diseases throughout the life of the child," said Marie A. Caudill, Ph.D., a researcher involved in the work from the Division of Nutritional Sciences and Genomics at Cornell University in Ithaca, New York.

To make this discovery, Caudill and colleagues conducted a 12-week study involving pregnant women in their third trimester who consumed either the control diet providing 480 mg choline per day, a level that approximates current dietary recommendations, or the treatment diet which provided 930 mg choline per day. Maternal blood, cord blood and placenta tissue were collected to measure the blood levels of cortisol, the expression levels of genes that regulate cortisol, and the number of methyl groups attached to the DNA of the cortisol regulating genes (the epigenetic changes). Those from mothers who consumed the higher levels of choline showed reduced levels of [cortisol](#).

"Depending on the relationship, one's mother can either produce stress or relieve it," said Gerald

Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "This report shows that her effect on [stress](#) begins even before birth. The importance of [choline](#) cannot be overstated as we continue to unravel the role it plays in human health and development."

**More information:** Xinyin Jiang, Jian Yan, Allyson A. West, Cydne A. Perry, Olga V. Malysheva, Srisatish Devapatla, Eva Pressman, Françoise Vermeulen, and Marie A. Caudill. Maternal choline intake alters the epigenetic state of fetal cortisol-regulating genes in humans. *FASEB J.* [doi:10.1096/fj.12-207894](https://doi.org/10.1096/fj.12-207894)

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