

Moms who eat high-fat diet before, during pregnancy 'program' babies to be fat, at risk

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New research in mice indicates that babies born to moms who eat a high-fat diet before and during pregnancy have a higher fat mass and smaller livers than babies whose moms consume low-fat fare, according to scientists at Oregon Health & Science University Doernbecher Children's Hospital.

The good news, the researchers report, is that moms who switch to a low-fat [diet](#) during pregnancy considerably reduce the risk of these negative effects. Their findings are published online in the *American Journal of Physiology and Endocrinology Metabolism*, a publication of the American Physiological Society.

Previous research has shown [babies](#) who receive too much or too little nutrition in the womb experience profound and permanent changes in their development — including alterations in the structure of the [liver](#), brain and pancreas — that increase their susceptibility to developing various diseases later in life, including obesity, diabetes and cardiovascular disease.

And given that nearly half of women of childbearing age are overweight or obese in the United States, according to the Centers for Disease Control and Prevention, there is a pressing need to inform women and their health care providers of the inherent dangers maternal overeating poses to their child's future health and risk of chronic disease.

"One of the key findings here is that the offspring are born with a

marked shift in [body composition](#), away from lean mass and toward fat mass, prior to any dietary exposure in the offspring themselves," said principal investigator Stephanie M. Krasnow, Ph.D., a scientist in the Papé Family Pediatric Research Institute at OHSU Doernbecher Children's Hospital.

Krasnow and colleagues in the Daniel Marks Lab used a mouse model to examine how consumption of a high-fat diet during pregnancy effects body composition in the newborn. Female mice were fed either a low-fat or high-fat diet for six months and were mated with male mice after 4, 12 and 23 weeks. The females who ate a high-fat diet gained more body weight and had a higher fat mass than the females who ate a low-fat diet. And on the day of birth, babies born to females who had consumed a high-fat food had more body fat, less lean mass, and smaller livers than the newborns of females that consumed low-fat food.

These changes in body composition and organ size occurred before the female mice eating a high-fat diet became obese, the researchers report. And even when the females were not obese, eating a high-fat diet prior to and during pregnancy "programmed" their unborn babies to have increased body fat and smaller livers at birth. Fortunately, the researchers found, switching to a low-fat diet just during pregnancy prevented the infants from accumulating excess [fat mass](#) in utero and also prevented their having smaller livers.

"These findings demonstrate that changing to a low-fat diet during [pregnancy](#) minimizes the harmful effects of maternal obesity on the newborn's body composition, potentially reducing the child's risk of developing obesity and related diseases later in life," said Krasnow.

Provided by Oregon Health & Science University

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