

Overall quality of pregnant woman's diet affects risk for two birth defects, study shows

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The overall quality of a pregnant woman's diet is linked with risk for two types of serious birth defects, a new study from the Stanford University School of Medicine has shown. In the study, women who ate better before and during pregnancy gave birth to fewer infants with malformations of the brain and spinal cord, or orofacial clefts, such as cleft lip and cleft palate.

Prior research on [diet](#) and [birth defects](#) has generally addressed one nutrient at a time. For instance, the [B vitamin](#) folic acid has been shown to protect against brain or spinal cord malformations known as [neural tube defects](#), which include anencephaly (a fatal defect in which the brain is lacking) and spina bifida (an opening in the [spinal column](#)). However, after [fortification](#) of the U.S. [food supply](#) with folic acid was implemented in 1998, these types of birth defects did not completely disappear. And other defects, including cleft lip and palate, remained a concern in the population. So scientists began examining other single-nutrient players in the diet-defect connection.

The new study took a different approach.

"Our study showed for the first time that the overall quality of the diet, and not just a single nutrient, matters in terms of reducing the risk of birth defects," said Suzan Carmichael, PhD, who is the first author of the study and an associate professor of pediatrics. The study was also the first to connect [diet quality](#) with reduced risk for cleft lip or cleft palate, she added.

"In the past, we've been trying to disentangle a particular nutrient from the composite diet. I think we're wrong in that approach," said Gary Shaw, DrPH, professor of pediatrics and the study's senior author. "It would have been really nice to have the [magic bullet](#) against birth defects. Folic acid was the hope for a magic bullet, and it clearly made a difference, but only made some of the difference."

The study, which will be published online Oct. 3 in Archives of Pediatrics & Adolescent Medicine, asked women from 10 U.S. states to answer detailed questions about their eating habits immediately before and during pregnancy. The subjects included 3,824 women whose fetuses or infants had a neural tube defect or a cleft lip or palate, and 6,807 women with healthy infants. The researchers analyzed the diet information using two well-validated methods for scoring overall diet quality. One score measures how well the diet matches a Mediterranean pattern, a diet rich in fruits, vegetables, whole grains, seafood and heart-healthy fat sources such as olive oil; the second score assesses similarity to the Dietary Guidelines for Americans issued by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture, which emphasize low-fat, fiber-rich foods, including lots of fruits and vegetables and low intake of processed foods. The two scoring systems have much in common, with both awarding high scores for consumption of fruits and vegetables and low scores for foods that deliver unhealthy saturated fats, such as red meat or butter, for example.

To calculate the protection conferred by the healthiest diets, women were ranked by diet score and then divided into four comparison groups. The women with the highest scores (in the top 25 percent) were 36 to 51 percent less likely than those with the lowest scores (the lowest 25 percent) to have a pregnancy affected by anencephaly, depending on which dietary scoring system was used. Similarly, the women with the highest diet quality scores had approximately 24 to 34 percent protection against giving birth to a child with [cleft lip](#). Higher diet quality was also

protective against the other two birth defects that were studied — spina bifida and cleft palate — but results were not quite as strong.

"The take-home message from the current work is that diet matters," Shaw said. "A better diet seems to make a difference in protecting against birth defects."

The reason a generally healthy diet confers more protection against these birth defects than a single measure, such as [folic acid](#) supplementation, is still not known, the researchers said. However, there are several possibilities. For one thing, eating a variety of healthy foods doesn't leave as much room in the diet for junk foods. Avoidance of unhealthy foods might explain some of the reduced risk.

Another possibility is that healthy foods are more than the sum of their nutrients.

"We may be capturing qualities of these foods that are beneficial to health but haven't been measured in isolation," Carmichael said. And the combinations of nutrients in such foods may also be important, she added. "In our bodies, nutrients interact. They don't just act in isolation; they depend on each other." So, for instance, eating fruits and vegetables that deliver several nutrients simultaneously may have greater benefits than consuming more of a single nutrient, she said.

It's also possible that healthy diet is a marker for some other component of a mother's lifestyle that protects against birth defects.

The researchers plan to extend their findings with future studies that examine the relationship between diet quality and other pregnancy outcomes, including other types of birth defects. They also hope to gain a better understanding of how a healthy diet exerts its protective effect.

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