Thank mom for your love of garlic

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You are what you eat, but you're also what your mother ate. Smells and tastes first experienced while developing in the womb can influence a baby's future taste preferences. Credit: Neeta Lind via flickr http://bit.ly/mOOruE

That special method to make spaghetti sauce can certainly come from a mother's influence -- but research shows that mothers have a big impact on their kids' food preferences for certain flavors even before a baby enters the world.

"The first way any of us learn about what foods are safe and good is from our moms," said Julie Mennella, a biologist at the Monell Chemical Sciences Center, a non-profit science institute in Philadelphia, Pa.

As babies grow in the womb in the second and third trimesters of pregnancy, they begin gulp amniotic fluid -- up to a liter per day. At the same time, taste receptors on their tongues and nasal openings are developing quickly, providing a way to sense the fluid's taste and smell.

The amniotic fluid is flavored with whatever mom is eating or drinking, especially with volatile compounds such as those found in fruits, vegetables, garlic and other flavors that get crunched up in the mouth sent around the body.

"When we talk about taste, it's really a combination of taste and smell," Mennella said, adding that babies also develop flavor preferences during breastfeeding.

In one study, Mennella and her team split 46 pregnant women into three groups and gave them instructions on what to eat. One group drank a glass of carrot juice four times a week during pregnancy and then switched to water when breastfeeding. The second group drank water during pregnancy and switched to carrot juice during breastfeeding. The last group avoided carrot juice entirely.

When the babies were five months old and just starting to eat solid foods, the researchers offered the infants two kinds of cereal: plain and carrot-flavored. The babies who had been exposed to carrot juice in their mom's amniotic fluid or breast milk were more willing to eat the carrot-flavored cereal, and were less likely to make an icky face when they ate the mush than babies who had never tasted carrots.

Diet Influencing Obesity

And it's not just flavor -- it seems that a life of obesity can also start in the womb.

Stepahnie Bayol, a research associate at the Royal Veterinary College in London, has been studying the effects of junk food diet on pregnant rodents. She said that when pregnant rodents which ate a diet of doughnuts and potato chips gave birth, their pups already had a preference for the same junky diet.

The baby rats put on weight more quickly and had higher cholesterol, glucose and insulin -- indicators for developing diabetes. Into adulthood, the rats born to moms who ate junk remained fatter. Bayol said the mechanisms are unclear, but she thinks it has something to do with epigenetics -- the way the genome is expressed.

"We're trying to see how the developments of the reward pathways to the brain are affected by the junk food diet," Bayol said.

Studying rodents is vital to developing better understanding of human physiology.

"The human population is complex -- there is too much going on to control. For true physiological effects you need animal models," Bayol said, adding that animal studies often lay the groundwork for improving human studies by focusing on specific types of food or times in a baby's development.

Smell and tastes from the womb can even change the way a brain develops. In another rodent study, Josephine Todrank at the University of Haifa in Israel, found that odors in the amniotic fluid could make the brain's smell-processing center more sensitive.

Todrank said that this is particularly important for animals.

"If the babies knew that their mother ate something and survived, then their chances of survival are improved, so they'll be cautious about new flavors but confident about previously-encountered flavors," Todrank said. "The increased sensitivity will help them identify the foods they experienced in utero or as pups."

Developing A Picky Palate

If a child is picky, don't despair.

"Mothers need to let the child try a small taste over and over again, until the child really determines if he or she likes the food," Millie Horodynski, a nursing professor at Michigan State University in East Lansing, said.

In a recent study, Horodynski found that toddlers were less likely to consume fruits and vegetables four or more times a week if their mothers did not consume that amount or if their mothers viewed their children as picky eaters.

In another study conducted by Mennella, babies who were offered carrots for 10 days ate more of the vegetable on the 10th day than those who had only been exposed for one day.

"It's really a beautiful system. The mom and the rest of the family can be the best role models, she has to eat the foods in order for the baby to learn about them," Mennella said.

So you are what you eat, but you are also what your mother ate.

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