

Early diet of infants, not maternal obesity, influences development of gut microbiome

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After the age of nine months, the development of the infant gut microbiota is driven by the transition to family foods, not maternal obesity, according to results from a new study. The study was published online this week in *mSphere*, an open-access journal of the American Society for Microbiology.

"Our results reveal that the transition from early infant feeding to family foods is a major determinant for [gut](#) microbiota development," said senior author Tine Rask Licht, PhD, professor and head of the Research Group for Microbiology and Immunology, National Food Institute, Technical University of Denmark, Soborg, Denmark. "Maternal obesity did not influence microbial diversity or specific taxon abundances during the complementary feeding period."

The gut microbiota is a complex community of microorganisms that live in the digestive tract. Children are essentially born without microbes in their gut, and they are immediately colonized upon birth. The next several years are critical in establishing a person's endogenous gut microbiota. Later in life, the gut microbiota can change in response to factors such as diet, but only slightly. Each adult has a very distinct gut microbiota. "When you look at an adult's gut microbiota, it is more or less like a fingerprint," explained Professor Licht.

The gut microbiota is strongly affected by diet and has been linked with obesity. Children of obese parents have a higher risk of developing obesity, and this is only partially explained by genetic predisposition. While many previous studies have focused on the impact of early infant diet, particularly breastfeeding, few studies have addressed the influence of [maternal obesity](#) on the infant gut microbiota, which can occur either through microbes transmitted during birth or through the dietary habits of the family.

To shed light on the issue, Martin Laursen, a PhD

student at Technical University of Denmark, and colleagues compared the gut microbiotas of two cohorts of infants, one born from a random sample of healthy mothers (n=114) and the other born from obese mothers (n =113). The researchers analyzed stool samples from the children at nine months and 18 months. By nine months, most children have transitioned, at least partially, to a complementary diet. Microbiota data were compared to breastfeeding patterns and detailed individual dietary recordings.

The major determinants of gut microbiota development were breastfeeding duration and composition of the complementary diet. In both cohorts, gut microbial composition were strongly affected by introduction of family foods with high protein and fiber contents.

"We found that introduction of family foods is the main driver of development of the complex microbial ecosystem in the gut at age 9 months. The food determines the diversity and the composition of the microbiota, and this is very important," said Professor Licht. "It is well known that breast feeding has a great impact on [gut microbiota](#), but nobody has addressed the effect of diet at this age before."

More information: Laursen, M.F. et al. Infant Gut Microbiota Development Is Driven by Transition to Family Foods Independent of Maternal Obesity. *mSphere*. 10 February 2016. [DOI: 10.1128/mSphere.00069-15](https://doi.org/10.1128/mSphere.00069-15)

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