

# Study looks at association of infant gut microbiome, delivery mode and feeding

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The composition of the gut microbiome in infants at six weeks of age appears to be associated with the delivery method by which they were born and how they were fed, according to an article published online by *JAMA Pediatrics*.

The [human gastrointestinal tract](#) is colonized by a large diversity of bacterial life (often called the microbiome) after birth and after the start of feeding. In adults, a growing body of literature focuses on the gut microbiome and health outcomes. In [infants](#) and children, comparatively little is known about the exposures that shape the gut microbiome and its lifelong health effects.

Anne G. Hoen, Ph.D., of the Geisel School of Medicine at Dartmouth, Lebanon, N.H., and coauthors examined associations between delivery mode and feeding method with the composition of the gut microbiomes of 102 infants. The study used medical records to ascertain delivery mode, questionnaires on feeding and stool samples for microbiome composition.

The 102 infants were an average gestational age of nearly 40 weeks, of whom 70 were delivered vaginally and 32 by cesarean section. In the first six weeks of life, 70 were exclusively breastfed, 26 had combination feeding (both breast milk and formula) and six were exclusively fed formula.

The authors observed associations between the composition of the [gut](#)

[microbiome](#) and the delivery mode. Differences in microbiome composition between infants delivered vaginally and infants delivered by [cesarean section](#) were equivalent or greater than the differences in composition by feeding method.

Infants who were fed a diet of both formula and breast milk had a stool microbiome similar to that of infants who were exclusively fed formula. Exclusive breastfeeding was associated with a microbiome distinct from that of infants either exclusively fed formula or fed a combination of formula and [breast milk](#).

The authors note their study is limited by factors including its population from a single group in the United States, which limits the generalizability of the results, and the study sample size of 102 infants. Also, while [feeding](#) practices were categorized, the exact proportion of the infants' diets and timing were not considered.

"Understanding the patterns of microbial colonization of the intestinal tract of healthy infants is critical for determining the health effects of specific alterable early-life risk factors and exposures. To this end, we have identified measurable differences in microbial communities in the intestinal tracts of infants according to their delivery mode and diet, with possible consequences for both short- and long-term health," the study concludes.

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