

Probiotics shown to create order in preterm babies' guts, fight antimicrobial resistance

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Five drops equals 2 billion beneficial bacteria. The numbers are staggering and the probiotics beneficial for premature babies. Credit: UiT The Arctic University of Norway/Jan Fredrik Frantzen

Every year about 15 million preterm babies are born worldwide who

suffer from a risk of infection and inflammation. Being born many weeks or even months before their expected due date, their immune system is less mature than in full-term babies, including impaired gut barrier function and a different microbial community in the large intestine.

Giving antibiotics to preterm infants disrupts the maturing process of the gut microbiome, and makes them more vulnerable to antimicrobial resistant variants of harmful bacteria.

Researchers at UiT The Arctic University of Norway have found that probiotics help [preterm babies](#) achieve a better bacterial balance in the gut and eradicate harmful bacteria, as the under-developed gut microbiome works its way into maturity. The study is published in the journal *eBioMedicine*.

Helping preterm babies catch up with their fellow newborns

The researchers behind the study used data from a clinical trial where [stool samples](#) were collected four times in the first year of life from 72 babies in six Norwegian neonatal intensive care units. They then divided the samples into groups depending on whether the newborns were given antibiotics, a combination of antibiotics and probiotics, or none. The microbial DNA in the samples was sequenced to follow the development of the babies' [gut microbiota](#).

The study supports the findings of other recent studies showing that probiotics boost normal microbiota and maturation in preterm infants to levels comparable to full-term newborns.



Researchers Claus Klingenberg, Ahmed Bargheet and Veronika K Pettersen at UiT The Arctic University of Norway have shown that probiotics are beneficial for improving premature babies' gut development, as well as combatting AMR. Credit: UiT The Arctic University of Norway/Jan Fredrik Frantzen

Less antimicrobial resistance

There is another finding that should be very interesting to medical staff around the world fighting antimicrobial resistance, or AMR. With probiotics, the extremely [preterm infants](#) showed a decreased risk of carrying antimicrobial resistant bugs despite frequent treatment with antibiotics.

"We discovered that probiotic-supplemented preterm newborns have

bacteria that carry substantially fewer antibiotic-resistance genes, than infants that did not get probiotic supplements," says doctoral research fellow Ahmed Bargheet, the first author of the study.

More information: Ahmed Bargheet et al, Development of early life gut resistome and mobilome across gestational ages and microbiota-modifying treatments, *eBioMedicine* (2023). [DOI: 10.1016/j.ebiom.2023.104613](https://doi.org/10.1016/j.ebiom.2023.104613)

Provided by UiT The Arctic University of Norway

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