



Probiotic Research Update January 2024

Evidence for the beneficial effects of *Bifidobacterium infantis*

Batta VK, Rao SC, Patole SK. *Bifidobacterium infantis* as a probiotic in preterm infants: a systematic review and meta-analysis. *Pediatr Res.* 2023 Dec;94(6):1887-1905.

This Systematic Review and meta-analysis included 67 RCTs with over 14,600 babies to compare studies with and without *B. infantis*. Effects on NEC, late-onset sepsis and mortality were reported. The results show a significantly greater reduction of NEC in the babies who received, amongst other probiotics, *B. infantis* (RR 0.38 vs RR 0.67; $p=0.01$). Whilst the studies were not designed for this subgroup analysis, it provides evidence that, if clinicians are going to give probiotics to premature babies to reduce the risks of NEC and other critical outcomes, the probiotic should include *B. infantis*. This should be taken alongside the additional evidence that previous systematic reviews have shown that multistrain probiotics are more effective than single strain probiotics.

Of course we are going to mention that Labinic is a multistrain neonatal probiotic containing 3 live strains and contains *B. infantis* as well as *L. acidophilus* and *B. bifidum*. Labinic is also tested to full live viability demonstratable at 2 years from date of manufacture.

Full text link to review [here](#)

Bifidobacterium longum subspecies *infantis*: champion colonizer of the infant gut

Underwood MA, German JB, Lebrilla CB, Mills DA. *Bifidobacterium longum* subspecies *infantis*: champion colonizer of the infant gut. *Pediatr Res.* 2015 Jan;77(1-2):229-35

An older paper here from 2015, which reminds us that *B. infantis* is a subspecies of *B. longum* (to give its full name it is *Bifidobacterium longum* ssp *Infantis*). It has the ability to grow particularly well where it can digest numerous HMOs present in human breast milk enabling it to have a growth and colonisation advantage. *B. infantis* also demonstrates anti-inflammatory effects, diminishing the effects of IL-6 and IL-8 and toll-like receptor activation. *B. infantis* has also been shown to reduce the permeability of the intestinal wall, through for example stabilisation of tight junctions, which helps to protect the host from translocation of pathogenic bacteria and reducing the accumulation of Enterobacteria through a competitive advantage. *B. infantis* has also been associated with improved weight

** DISCLAIMER: This brief review was produced for Biofloratech Ltd who manufacture, and supply, Labinic Drops, a multispecies liquid probiotic food supplement. This review is written in technical language and is only intended for professional use. The content is not intended to advertise nor to describe any health claim for Labinic Drops, and all words including "probiotic" are used purely in their scientific WHO-approved forms. The purpose of the review is to stimulate discussion, debate and formulate research questions for the future.
www.biofloratech.com



gain and better responses to vaccinations, through the interactions between the immune system and the infant gut.

Full text link [here](#)

Symbiosis between *B. infantis* and HMOs is needed for colonisation success

Reens AL, Cosetta CM, Saur R, Trofimuk O, Brooker SL, Lee ML, Sun AK, McKenzie GJ, Button JE. Tunable control of *B. infantis* abundance and gut metabolites by co-administration of human milk oligosaccharides. *Gut Microbes*. 2024 Jan-Dec;16(1):2304160

This work was carried out in adult volunteers, but it is of relevance to the neonatal population. Using the knowledge that *B. infantis* will thrive in the presence of HMO's enabled researchers to test the hypothesis that abundance of *B. infantis* could be "tuned" by regulation of the amount of HMO present. Previous work has suggested a minimum nutrient threshold to ensure colonisation. This group demonstrated that, in healthy adults, prior treatment with antibiotics improved *B. infantis* colonisation, probably as a result of reducing competitive pressure and creation of an HMO-rich preferential environment. The authors demonstrated, in mice, that a higher dose of HMO significantly increased the colonisation. In addition, they demonstrated enhanced production of lactate, propionate and acetate, which in turn act as substrates for other probiotics.

Perinatal Antibiotic Exposure– what happens to the Microbiome?

Ainonen S, Tejesvi MV, Mahmud MR, Paalanne N, Pokka T, Li W, Nelson KE, Salo J, Renko M, Vänni P, Pirttilä AM, Tapiainen T. Antibiotics at birth and later antibiotic courses: effects on gut microbiota. *Pediatr Res*. 2022 Jan;91(1):154-162

This paper addresses a major issue, which is the exposure of babies to antibiotics at or soon after birth. Fetal exposure to antibiotics occurs when babies are delivered by Caesarean section (and in many high income settings this is now the majority), or when mothers are given antibiotic prophylaxis (IAP) for Group B Streptococcus carriage or risk. Suspected chorionamnionitis and urinary tract infections in the mother are not uncommon, also resulting in fetal antibiotic exposure. Newborn babies with risk factors for sepsis are given empirical antibiotic treatment, occurring in around 2-10% of term babies depending on local and national policies. It is therefore unsurprising that the microbiome diversity and composition are affected, and this may persist.

** DISCLAIMER: This brief review was produced for Biofloratech Ltd who manufacture, and supply, Labinic Drops, a multispecies liquid probiotic food supplement. This review is written in technical language and is only intended for professional use. The content is not intended to advertise nor to describe any health claim for Labinic Drops, and all words including "probiotic" are used purely in their scientific WHO-approved forms. The purpose of the review is to stimulate discussion, debate and formulate research questions for the future. www.biofloratech.com



This study was a prospective cohort design and was conducted in a single centre in Finland. There were 150 babies enrolled who had been exposed to IAP and/or postnatal antibiotic treatment. Significant differences between the control groups and the antibiotic exposed babies were seen. In particular, E. coli was significantly lower in the control group than in any of the perinatal antibiotic exposed groups. The effect of perinatal antibiotics persisted to 1 year of age, with a dose-dependent pattern. The group receiving postnatal antibiotics received a single strain Lactobacillus during their hospital stay, but there was no evidence for persistence of this strain.

This fits with other studies that have, for example, shown that even a single dose of amoxicillin leads to a reduction in Bifidobacteria which persists for more than 6 months ([Korpela K et al, Ped Research 2020:88:438-443](#)).

The FDA and Probiotics

[Embleton ND, Berrington J, Clarke P, Deierl A, Luyt K, Spruce M, Oddie SJ. Probiotics for preterm infants and the recent FDA alert in the USA. Arch Dis Child Fetal Neonatal Ed. 2023 Dec 16:fetalneonatal-2023-326580.](#)

This is one of a number of responses to the FDA’s recent actions on probiotics in neonates, where they have actively targeted 2 manufacturers of probiotics who may have implied a health benefit from the use of probiotics. The authors comment on the evidence and their own practices and the importance of involving parents in decision-making about how their babies are managed.

Probiotic bloodstream infection, which appears to be rare, does not generally result in babies becoming very sick, since the bacteria do not produce the same toxins as, for example, Gram negative organisms. Probiotics are also sensitive to antibiotics.

Parents should always understand what remedies their babies are on and why, as well as important side-effects. The acknowledgment of risk-benefit is one accepted by clinicians and by parents but apparently not, yet, by some regulators. B. infantis is still Generally Recognised As Safe (GRAS) for use in infant formula, by the FDA ([link here](#)).

Biofloratech makes no health claims for Labinic drops in line with European and other international guidance and any decision for use for any reason is made by a responsible individual. Labinic is a nutritional supplement, not a pharmaceutical. Our website and any information, including this technical bulletin, is intended for inter-professional discussion, and is/are not a recommendation for use, inducement to use or advertising. All materials are only for use by individuals in countries where the use of the word “probiotics” is permitted and these disclaimers, including that at the foot of the page, are fully valid.

+++++

** DISCLAIMER: This brief review was produced for Biofloratech Ltd who manufacture, and supply, Labinic Drops, a multispecies liquid probiotic food supplement. This review is written in technical language and is only intended for professional use. The content is not intended to advertise nor to describe any health claim for Labinic Drops, and all words including “probiotic” are used purely in their scientific WHO-approved forms. The purpose of the review is to stimulate discussion, debate and formulate research questions for the future. www.biofloratech.com



Effects of maternal diabetes on the Neonatal Microbiome

Gajecka M, Gutaj P, Jaskiewicz K, Rydzanicz M, Szczapa T, Kaminska D, Kosewski G, Przyslawski J, Ploski R, Wender-Ozegowska E. Effects of maternal type 1 diabetes and confounding factors on neonatal microbiomes. Diabetologia. 2024 Feb;67(2):312-326

This is an interesting study which demonstrated significant differences in the neonatal gut microbiome and ear microbiota between babies born to mothers with and without Type-1 diabetes. They also showed that a poorly controlled diabetic sub-population had differences in the ear microbiota.

Perhaps most importantly, they found that Bifidobacterium was lower in samples derived from mothers with Type 1 diabetes.

+++++

Whats new in NEC research?

Good M, Khashu M. Editorial: Recent advances in our understanding of NEC pathogenesis, diagnosis, and treatment. Front Pediatr. 2023 Nov 7;11:1326204

This editorial summarises the contents of an excellent edition of Frontiers in Pediatrics focussed on what is new in NEC – pathogenesis, diagnosis and treatment. The publication describes bench, animal and human research updates and is well worth a read. This is a very useful resource.

Full link to all articles [here](#); links in Editorial too

The article on probiotics has a strong US flavour and the recent [Sowden paper](#) where Labinic was used is cited. They did however spell Biofloratech incorrectly, but apart from that it’s a good read!

+++++

This update was commissioned by Biofloratech Ltd who manufacture Labinic® Drops, a liquid multi-strain probiotic containing Lactobacillus acidophilus, Bifidobacterium infantis and Bifidobacterium bifidum in a total daily recommended dose of 2 billion cfu/day. Labinic is manufactured to stringent high-quality control standards in a GMP manufacturing licenced pharmacy.

Labinic has an excellent safety profile and is widely used in NHS (UK) and overseas neonatal units.

** DISCLAIMER: This brief review was produced for Biofloratech Ltd who manufacture, and supply, Labinic Drops, a multispecies liquid probiotic food supplement. This review is written in technical language and is only intended for professional use. The content is not intended to advertise nor to describe any health claim for Labinic Drops, and all words including “probiotic” are used purely in their scientific WHO-approved forms. The purpose of the review is to stimulate discussion, debate and formulate research questions for the future. www.biofloratech.com



We are pleased to see further evidence of its use emerging in clinical papers and we confirm that we have had no influence over any publications describing its use.

Thank you for reading this update, we hope you found it interesting. Please feel free to share with healthcare and other professional colleagues. All disclaimers fully applied.

Biofloratech Ltd