PROBIOTIC USE IN INFANCY

THE INFANT GUT MICROFLORA

Having a balanced gut flora is important for everyone, but especially important from birth to give the infant the best possible start in life. The trillions of microorganisms in the gut (including many types of bacteria) play an essential role in supporting strong immune and digestive systems.

At birth the infant’s gut flora is obtained from the mother and environment around them. Originally thought to be born sterile, new research is indicating some microbes may travel via the placenta to the foetus. During birth, infants born vaginally are exposed mainly to microbes that originate from the mother, whereas those delivered by caesarean section appear to acquire intestinal flora mainly from the environment. Breast milk is a natural source of continuous bacteria, with bifidobacteria understood to be the predominant species in a breast fed infants gut. The two most predominant species appear to be *Bifidobacterium breve* and *Bifidobacterium infantis*. Breast milk also naturally contains a prebiotic, which is essentially a food source for beneficial bacteria such as bifidobacteria, imperative to selectively increase numbers in the immature and developing gut.

THE GUT FLORA AND IMMUNITY

Particularly in early life, the composition of the gut flora profoundly influences the development of the immune system and the gut mucosal lining. This is not surprising, as up to 70% of immune cells are located within the gut. A strong protective gut flora and immune system is imperative to protect the infant against the common cold, respiratory infections, infectious diarrhoea and other stomach bugs. The incidence of allergic diseases such as eczema, asthma and hay fever are ever increasing in early life and are associated with an altered or less diverse gut microflora, an impaired gut lining and a malfunction of the immune system.

THE GUT FLORA AND DIGESTION

A balanced gut flora is necessary to assist in the digestion of milk and the later introduction of solids, regular healthy bowel movements and a strong protective gut lining (where food absorption takes place). Any imbalance could lead to digestive symptoms such as constipation, diarrhoea, bloating, flatulence and cramping. It is important that the digestive system works effectively so that the infant is able to gain adequate nutrients to function and grow optimally, and to reduce the risk of pain associated with poor digestion. The gut flora appears to be imbalanced in infants suffering from colic. They often have fewer levels of beneficial Lactobacilli that produce much less gas than potential pathogens.

THE GUT FLORA AND THE BRAIN CONNECTION

It is already widely accepted that the brain sends signals to the gut, which is why stress and other emotions can contribute to gut symptoms. However, research is now indicating that the signals also travel the opposite way. Gastrointestinal symptoms have been found to be strongly correlated with the severity of autism. An abnormal gut flora is repeatedly observed in these children. It has been suggested that pathogenic micro-organisms produce toxins that could potentially cross the blood brain barrier and interfere with brain development.

THE USE OF PROBIOTICS IN INFANTS

Probiotics have been shown to positively influence the infant’s gut flora balance and developing immune system, showing promising results in the prevention and management of infectious diarrhoea and allergies in particular. Probiotics given to infants from birth seem to increase resistance to common coughs and colds and reduce the need for antibiotic use. Research suggests that a probiotic given directly to an infant is more likely to become part of its resident gut flora opposed to that given to the mother and delivered via the breast milk. As with many studies, results vary and probiotics often appear to be more effective as prevention opposed to treatment. Probiotics are generally not found in commercial formulas due to the required high water temperature destroying the live bacteria. Probiotic powders should be added to the formula once at the temperature ready for consumption by the infant.
### The Safety of Probiotics in Infancy

A study in 2008 looked at the long term safety of giving prebiotics and probiotics (a synbiotic) daily for 6 months to 925 infants from birth. Infants in both treatment groups grew normally, and no difference in morbidity related to synbiotics occurred. The multi-strain synbiotic was considered safe after the 2 year follow up. A review in 2011 that looked at 16 studies of 3432 infants giving probiotics directly to infants from the first day of birth, noted that no serious adverse events were reported.

### References


### Table: Author Species Dosage Study Details

<table>
<thead>
<tr>
<th>Author</th>
<th>Species</th>
<th>Dosage</th>
<th>Study Details</th>
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<tbody>
<tr>
<td>West et al, 2013</td>
<td>Lactobacillus acidophilus, L. casei, L. reuteri, Bifidobacterium longum, B. bifidum</td>
<td>1x10^10 CFU (10 billion) daily for 3 weeks</td>
<td>Caregivers reported decrease in diarrhoea 48%, constipation 52% and 88% improvement of Autism spectrum disorder (ASD) symptoms such as speech/language/communication, sociability, sensory/physical behaviour in 33 children.</td>
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<td>Expedito &amp; Yala, 2010</td>
<td>Lactobacillus casei, L. hamnosus, L. bulgaricus, L. acidophilus, Streptococcus thermophilus, Bifidobacterium breve, B. infantis</td>
<td>1x10^10 CFU (1 billion) daily during hospital stay</td>
<td>Reduced diarrhoea, improved stool consistency and shortened hospital stay in infants 2 months to 2 years old with acute gastroenteritis.</td>
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<td>Khodadad &amp; Sabbaghanian, 2010</td>
<td>Lactobacillus casei, L. hamnosus, L. bulgaricus, L. acidophilus, Streptococcus thermophilus, Bifidobacterium breve, B. infantis</td>
<td>1x10^10 CFU (1 billion) once daily for 4 weeks</td>
<td>Improved symptoms of constipation in 97 children aged 4-12 years.</td>
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<td>Farid et al, 2010</td>
<td>Lactobacillus casei, L. hamnosus, L. bulgaricus, L. acidophilus, Streptococcus thermophilus, Bifidobacterium breve, B. infantis</td>
<td>1x10^10 CFU (1 billion) twice daily for 6 weeks</td>
<td>Improved the severity of atopic dermatitis (eczema) in 40 infants and children aged 3 months to 7 years.</td>
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<tr>
<td>Savino et al, 2010</td>
<td>Lactobacillus reuteri</td>
<td>1x10^10 CFU (100 million) for 21 days</td>
<td>Significantly improved symptoms of colic in 46 breastfed infants aged 2 to 16 weeks.</td>
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