

# Establishing the Infant Microbiome

good belly bugs  
for optimal infant health

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Something invisible and miraculous is happening in your baby: a window of opportunity is open which may allow you to reduce the likelihood of your child developing allergies, eczema, asthma, celiac disease, depression, obesity, diabetes, and even ADHD. Soon after those early months, it seems, this opportunity might close for good.

I'm referring to the development of the microbiome and the concept of microbial programming.

## Happy healthy bugs

The microbiome refers to the consortium of microorganisms – yeast, bacteria, fungi, and viruses – that replicate and colonize our bodies in the first few months of life. About 100 trillion of them live in the gut alone.

Scientists are still “mapping” the microbiome in an effort to more fully understand its intricate structure and function, but an explosion of research over the last decade suggests that microbial balance and diversity are important factors to consider in the quest for optimal health. Microbes have been found to contribute to the regulation of dozens of processes including digestion, hormone regulation, fat deposition, DNA expression, and immune function. Microorganisms are so important to our body's function that the microbiome is now considered to be an organ.

The newer concept of microbial programming suggests that pregnancy and the first year of life might represent a programming period during which our microbes organize themselves and set either a pattern of balance or imbalance that may last a lifetime. It seems that the healthier your microbiome was as a baby, the easier time you will have correcting and maintaining that balance as an adult.

Given its potential for reducing disease, researchers and parents are naturally interested in how we might best promote diverse and healthy colonization of the microbiome in babies.

Here's what we know so far about establishing the infant's microbiome.

## The impact of cesarean sections

First off, birth method seems to matter. Over 50 studies have looked at the potential impact of birth method on health later in life and significant evidence suggests that children born via c-section have a higher chance of developing obesity, asthma, diabetes, and possibly even learning difficulties, mental health issues, and digestive problems like Crohn's disease.

It's difficult to prove a definitive connection between birth method and health outcomes, but it could be the disruption of the natural process of microbial colonization caused by the cesarean that is driving this trend. Because they do not exit via the birth canal where they would be bathed in the mother's flora, children born via c-section are found to have a higher degree of streptococci bacteria with lower levels of the protective bifido and lactobacilli strains. This early shift in microbiota might set the stage for a poorly developed microbiome and subsequent risk for disease.

### What to do...

If you are planning a cesarean delivery, talk to your doctor or midwife about vaginal swabbing. This practice is thought to help reduce the potential negative effect of cesarean by inoculating a baby with the mother's vaginal flora. Supplement with appropriate probiotic strains during pregnancy and consider a daily probiotic supplement for your newborn. Speak to a licensed health care practitioner for recommended products and dosing.

## The impact of water birthing

While it has its benefits for pain, water birthing might interfere with your new baby's microbial colonization.

The chlorine in tap water has been shown to kill off beneficial bacteria in the skin, lungs, and gut. Although proceeding through the birth canal assures the baby gets bathed in the bacteria, there is the potential it will be washed away before it can colonize.

### What to do...

If you are choosing a water birth, you'll want to avoid the use of chlorinated tap water. Also consider an infant probiotic and vaginal swabbing right after birth.

## The impact of skin and breastmilk

Getting your baby to the breast and next to mom's skin are the next steps to colonize those gut bugs.

The skin, colostrum, and breastmilk contain important probiotic bacteria and this 'liquid gold' coming out of the breast also contains important prebiotic carbohydrates. The more lag time between delivery and the initial breastfeeding session, the greater chance that the bacteria found in the environment (and on the hands of the

delivery team) will take up residence in the child's microbiome in place of what's supposed to be there.

## What about a probiotic supplement?

Once your new baby is feeding, the next thing you'll want to consider is whether a probiotic supplement can be helpful.

The *Swansea Baby Allergy Prevention Trial* is one study that investigated the safety and efficacy of probiotic supplementation in the development of allergy. 454 mother-infant pairs participated in the double-blind placebo trial. The study group was given a daily dose of four strains of probiotics from 36 weeks gestation through infancy up to age six months. The children were then assessed for adverse reaction, atopic eczema, and allergy, and then again after two years.

In terms of safety, the results showed no adverse events either caused or exacerbated by the probiotics. In terms of efficacy, while they did not see a significant reduction in eczema in the infants, they did find a 54% reduction of allergy to cow's milk, egg, grass pollen, tree pollen, house dust mites, nuts, and fish, as measured by a skin prick test at age two.

Before giving any supplements to your baby you should talk with your healthcare team, but probiotics are showing themselves to be a safe and effective way to stabilize immune function when given in infancy.

### What to do...

Choose a probiotic supplement that is created for infants and contains several different types of bacteria. You can start as soon after birth as you can remember to give it.

If you are not breastfeeding, choose a supplement that has the added prebiotic called galacto-oligosaccharides (GOS). This is a prebiotic found in mother's milk that is missing from most formulas, even if they are fortified with probiotics; it helps feed the probiotic bacteria, assisting in their colonization.

## The impact of early food choices

Once your baby shows signs of being ready to transition to solid foods, your options for nourishing their gut bugs open up further.

Whole, organic, fresh foods like fruits, vegetables, meats, and grains, along with healthy fats, offer prebiotic fibre, phytochemicals, and enzymes, as well as vitamins and minerals that nourish the entire digestive system, keeping it healthy and suitable for bacterial colonization. Feeding happy gut foods will result in a happy microflora with healthy digestion. Check out our *Feeding Your Baby's Belly Bugs* at [EcoParent.ca](http://EcoParent.ca) for more detailed information on the food front!

Studies continue to enlighten us about the impact of the gut microbes on our health. It is quite likely that focusing our attention on nourishing belly bugs in our babies will reap a lifetime of health rewards. •

For references and further reading, head over to [www.ecoparent.ca/extras/SPR18](http://www.ecoparent.ca/extras/SPR18)